# PHILIPPINE SCIENCE & TECHNOLOGY ABSTRACTS



SCIENCE AND TECHNOLOGY INFORMATION INSTITUTE INFORMATION RESOURCES AND ANALYSIS DIVISION

> Department of Science and Technology Bicutan, Taguig City, Metro Manila Philippines

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### PHILIPPINE SCIENCE AND TECHNOLOGY ABSTRACTS

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0001-0128
0129-0237
0238
0239-0277
0278-0279
0280
0281-0311
0312-0325
0326-0341
0342-0348
0349-0356
0357-0367
0368-0375
0376-0378
0379-0404
0405-0432
0433-0512
0513-0586
0587-0600
0601-0603
0604
0605-0606
0607-0609

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#### AGRICULTURE

#### 0001

#### 2 more private rice hybrids for wider farmers' choice Pablico, Sosi

The new varieties released by the National Seedling Industry Council (NSIC) include NSIC Rc166H (Mestizo 10) and NSIC Rc168H (Mestizo 11). The former is recommended for planting in Cagayan, isabela, Nueva Ecija and Davao, while the latter is recommended for transplanting during dry and wet seasons in Nueva Ecija, Isabela, Davao provinces, Bohol, Bukidnon and areas where the rice variety IR64 is adapted .

Keywords: Agriculture, Rice, NSIC Rc166H (Mestizo 10), NSIC Rc168H (Mestizo 11), IR64

Agriculture magazine, Volume No. 13 Issue No. 2, 16-17 (Filipiniana Analytics) Fil(S) S19 A83 13/2 2009

0002

### Adaptability and management of vegetables legumes and cereals in ashfall and lahar areas *Aganon, Clarita P., Patricio, Marilyn G.*

The displacement of farmers in their farmlands brought about by Mt. Pinatubo eruption has been continually addressed for the last five (5) years. One of the factors that greatly influenced the fanners decision to leave their farms is the sudden change in soil characteristics such as the texture and water holding capacity. They believe that nothing can be grown under this condition. Inherently sandy in texture, water holding capacity is low and holding infiltration and percolation is rapid, not to mention that such deposits are practically devoid of major plant nutrients.

Soil of this nature need to be improved physically and chemically in order to provide source of livelihood to the affected farmers. Increasing the organic matter content of volcanic deposits is one of the strategies to improve granulation and water holding capacity. Water management and cultivation procedure such as adequate rate of time and application are equally important considerations. Several crops such as peanut, soybean, mungbean, sweet potato, sunflower, sesame, raddish, rice, squash, tomato, eggplant, okra and onion were used as test crops in 1991 to 1993. On-farm trials whereas corn, cabbage and sorghum were used in 1994 to 1995. Fertilizer rates were evaluated for each of the crops.

Organic .fertilizer was supplemented in most of the fertilizer trials to hasten organic matter build-up in the soil and fertility in the long run. Except mungbean, the rest of the crops tried in ash and lahar areas at certain rates of fertilizer application performed well.

During the period, trainings and technical assistance were provided to cooperators in coordination with farmers cooperatives while financial assistance was made possible through the Tarlac Peoples Economic Foundation Inc., Rotary Club of Manila, Canadian Embassy, and the Mt. Pinatubo Commission. Sixteen trainings were conducted from 1992 to 1994 with 279 farmer participants. The area cultivated in Culatigan, Concepcion, Tarlac increased from 0 to 200 hectares within the 3 year period whereas in San Jose, San Antonio, Nueva Ecija the increase was 1.25 percent within one year period. The slow increase in cultivated areas was basically due to lack of available capital.

Succeeding studies from 1996 to present was focused on refining the technologies for rice. (Author's abstract)

Keywords: Agriculture, Cereals, Organic fertilizer, Ashfall, Lahar

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 22 Issue No. 4, 1-22 (Filipiniana Analytics) Fil(S) T1 N21 22/4 1997

0003

#### Alternative management strategies against the rice root-knot nematode, *Meioidogyne* graminicoia in rice-onion system

#### Gapasin, Ruben M., Judal, Maria Victoria L., Pile, Clarenda P., Gergon, Evelyn B., Gapud, Victor P., Obien, Santiago R.

Studies were conducted to determine alternative management strategies against the rice root-knot nematode, Meioidogyne graminicola in rice-onion system. The cannister experiment aimed to determine the effective soil depth level reached by rice hull burning (RRB) on nematode mortality showed that nematodes were killed by heat even at 15 cm depth. Several galls in the roots were counted in rice seedlings in the unburned treatments as compared to zero galls in all the burned treatments (0,5,10,15 cm depth). The field experiment using RRB significantly affected the number of galls and in most cases the nematode densities in the soil roots. Yield of onion increased almost three folds in the burned treatment. Pot experiment showed that Tagetes sp. and two Crotaiaria species reduced the number of galls and nematode densities in the soil by 73-96 % and increased fresh root weight when incorporated in the soil. Rice hull burning and the use of Tagates and Crotaiaria could be effective alternative management strategies for *M. graminicola* in rice onion system. (Author's abstract)

**Keywords:** Agriculture, Root-knot, Nematode, Meioidogyne graminicoia, Rice hull burning, Tagetes sp., Crotaiaria sp., Onion, Rice, Antagonistic plantas, Non-host

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 23 Issue No. 2, 69-75 (Filipiniana Analytics) Fil(S) T1 N21 23/2 1998

0004

#### Analysis of genetic diversity in coconut by RAPD Rodriguez, M.J.B., Estioko, L.P., Namia, M.T.I., Soniega, J.A.

The conditions that influence the sensitivity, specificity, reproducibility of the RAPD technique as a tool in analyzing genetic diversity in coconut were rigorously optimized/standardized. Thus, the procedures for efficient isolation of genomic DNA from coconut, its amplification by PCR to give distinct and reproducible products, and the analysis of the banding data using mathematical calculations have been established. With this technology, the genetic variations in the germplasm collection of the Philippine Coconut Authority (PCA) in Zamboanga were investigated. (Author's abstract)

Keywords: Agriculture, Biodiversity, Coconut, RAPD

Philippine Journal of Coconut Studies, Volume No. Issue No. , 39-45 (Filipiniana Analytics) Fil(S) SB401.C6 P45 v.38 2013

### Antibody titer response of cattle (Bos taurus) vaccinated with oil and aluminum adjuvanted FMD vaccine (Serotype O<sub>2</sub>, A<sub>24</sub> and C<sub>3</sub>)

Canda-Benigno, Carolyn, De Mayo, Angeles, Verin, Blesilda, Santos, Josefina C., Bautista, Marc Leo G.

This study was conducted to compare the protective antibody response of cattle (Bos Taurus) to oil adjuvanted vaccine and aluminum adjuvanted vaccine. Twelve imported Brahman cattle of both sexes with age 3-8 years were used in this study. Eight animals were vaccinated with oil adjuvanted vaccine, while four were vaccinated with aluminum adjuvanted vaccine. A booster shot was given to both groups 30 days after the first vaccination. Blood was collected prior to each vaccination. The antibody titers of the animals were monitored on day 0, 2 1,60 90,120 and 150 by Indirect ELISA. The mean antibody titer of the anima ls in both treatment groups was converted to log base 2.5 and was statistically analyzed using Duncan 's Multiple Range Test (p>0.05). There was no difference between animals vaccinated with oil adjuvanted vaccine and those vaccinated with the aluminum adjuvanted vaccine. The mean antibody titer for both animals were above protective level of 5.15, 5.44 for cattle given oil adjuvanted vaccine, 90 days after first vaccination. **(Author's abstract)** 

Keywords: Agriculture, Foot-and-mouth disease (FMD), Bos taurus, ELISA, Sus scrofa domestica

Animal Husbandry & Agricultural Journal, Volume No. 39 Issue No. 12, 25-28 (Filipiniana Analytics) Fil(S) SF1 A54 39/12 2006

#### 0006

#### The application of molecular marker-assisted selection in rice breeding Magpantay, Gerard B., Subudhi, Prasanta K., Mew, Teresita V., Domingo, Jessica P., Parco, Arnold A., Mendoza, Maresciele G., Lanceras, Jonaliza C., Huang, Ning, Angeles, Enrique, Khush, Gurdev S.

The potential use of molecular marker-aided selection in rice breeding has enormously increased with the advances in biotechnological tools. The technique allows high accuracy in selecting for desired characters with minimum time input, a requirement that would be very useful for rice breeders. PCR-based approach were performed in pyramiding resistance genes for bacteria leaft blight (Xa-4, xa-5, xa-13 and Xa21) in the IR24 background and blast resistance genes (Pi-1, Pi-2 and Pi-4) in the C039 background. More than 100 plants/ cross were surveyed and plants showing either enhanced and/or having broad spectrum of resistance were identified and found stable with molecular markers used for selection in the advanced generation ( $F_4$ ). The method was also successfully used in identifying the proportion of parents' genetic material in the backcross selection

With this approach, further refinement is aimed in reducing the cost by incorporation of gene tagging into the actual rice breeding programs, exploitation of other useful molecular markers and providing a database in varieties representing the breadth of variations in *Oryza sativa* species. (Author's abstract)

Keywords: Agriculture, Orysa sativa L., Xanthomonas oryzae, Pyriculana grisea

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No. , 113-122 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

### Assessment of economic losses caused by coconut mite through farmers': participatory research appraisal

Islam, N., Nahar, M.S., Islam, M.I., Rahman, M.S., Uddin, R., Sultan, M.K.

The participants listed 23 fruit species grown in the homesteads in which coconut is one of the leading species. They asserted that recently mite infestation became one of the most important pests in coconut. It was first noticed in their areas at the beginning of 2004. Almost all of the populations they grow were susceptible to the pest. They opined that, application of fertilizers increased level of mite attack. As they were not familiar with mite, they could not recognize when one is present. The community attempted to control the pest through the use of chemicals as well as

Keywords: Agriculture, Coconut farming, Coconut mite, Coconut fertilization

Philippine Journal of Coconut Studies, Volume No. Issue No. , 24-30 (Filipiniana Analytics) Fil(S) SB401.C6 P45 v.38 2013

### ASU to produce biodiesel from waste fats *Abello*,

Waste fats can be a good source of coco-methyl ester (CME) and can be used alone or blended with diesel for conventional engines. A biodiesel project is being conducted at the Aklan State University utilizing oil-containing wastes. The study showed that used or waste animal fats had no significant difference when converted to biofuel with that of pure coconut oil and other vegetable oils. Researchers observed the biodiesel fuel in an engine run test produced lesser engine noise, lesser emission smoke and more than double mileage compared to the engine that uses petroleum diesel.

Keywords: Agriculture, Biodiesel, Waste animal fats, Coco-methyl ester (CME)

Agriculture magazine, Volume No. 13 Issue No. 2, 25 (Filipiniana Analytics) Fil(S) S19 A83 13/2 2009

0009

Balimbing: a fruit with myriad uses *Tacio*, *Henryl*  Discussed are the many uses of balimbing (Averrhoa carambola). The fruit is entirely edible including the slightly waxy skin. It can be used as ingredient for bakery products, the juice is squeezed ta serve as beverage, aside from its medical uses. The unripe fruit is used in dyeing and removing iron-rust and occasionally used for cleaning and pol ishing metals since it contains potassium oxalate. The older folks in the rural areas, crushed shoots and leaves are used to cure headaches and ringworm, while the boiled flowers are used to expel worms. Likewise, studies showed the potential of balimbing as inhibitor such that the fruit or juice when used in combination with certain medications significantly increased their effective dosage within the body.

Keywords: Averrhoa carambola, Agriculture, Balimbing, Potassium oxalate

Agriculture magazine, Volume No. 13 Issue No. 12, 16-17 (Filipiniana Analytics) Fil(S) S19 A 83 13/12 2009

0010

#### Bioeconomics of native pig production in Marinduque Monleon, Arnolfo M.

total 54 respondents were purposely selected and interviewed determine the А of to bioeconomics of production Marinduque. native pig in

Selected reproduction traits such as age of gilt at breeding, litter size, litter index and parity index; production traits such as litter weight at weaning, weaning period, mortality rate and weight at maturity; and adaptability traits under local farming condition were determined.

Results revealed that the breeding age of gilt (6.71  $\pm$ 0.25 months) is the promising reproduction trait of the Philippine native pig (Sus domesticus).

For production traits, there was improvement in the age of weaning.

Moreover, the ability of the native pig to survive and reproduce under local farming condition was identified.

Regression analysis revealed a functional relationship between the breeding age of gilt and litter size, and between weight at weaning and litter size (p<0.05).

There was a stronger linear relationship between these traits (p<0.05). (Authors abstract)

**Keywords:** Agriculture, Bioeconomics, Marinduque, Philippine native pig, Production traits, Reproduction traits, Adaptability traits

Animal Husbandry & Agricultural Journal, Volume No. 40 Issue No. 3, 10-12 (Filipiniana Analytics) Fil(S) SF1 A54 40/3 2006

#### Butterfly manure: a novel source of bio-organic fertilizer

#### Peñalba, Fredelino, Cayabyab, Bonifacio F., Bayot, Rolando G., Aquino, Alicia G., Cayabyab, Florante F.

Butterfly manure from the larvae of *Danaus chrysippus* L., plain tiger was collected from the Tarlac butterfly breeding site. The main host plant where these larvae feed is *Calotropsis gigantea*. The larvae manure was air dried and analyzed at the Analytical Services and Soil/Plant Test Kit Project of the Department of Soil Science, U.P. Los Baños.

The nitrogen (N) content of butterfly manure at 1.19% approximates that of carabao (1.09%-1.22% a.i.). Its potassium content of 2.14% is higher than that of cattle and almost equal to poultry. The other chemical components of butterfly manure are discussed and compared with other sources of bio-organic fertilizers. (Author's abstract)

Keywords: Agriculture, Danaus chrysippus, Butterfly manure, Bio-organic fertilizer, Larvae, Poultry, Cattle, Plain tiger, Nitrogen, Potassium

Transactions of the National Academy of Science and Technology, Volume No. Issue No. , 294 (Filipiniana Analytics) Fil(S) Q149.P5 N25 v.22 2000

0012

#### Cactus: nature's phytochemical specialist Palypayon, Concepc

Cactus belongs to the family Cactaceae and characterized as fleshy, erect or climbing, with much thickened and green colored stem, leafless with few to many sharp spines which arise from small areolae. Among the cactus grown in the Philippines, the dilang baka or *Nopalea cochinellifera* is used as an ornamental plant. This species exhibited medicinal properties and had been used as poultices to cure articular rheumatism, ear and eye inflammation as well as toothache. Studies also showed its potential as a cure for cancer and diabetes. In-depth studies, however, had been encouraged to test the efficacy of cactus in curing cancer.

Keywords: Agriculture, Cactus, Nopalea cochinellifera, Cactaceae, Dilang baka

Canopy International, Volume No. 26 Issue No. 6, 4 (Filipiniana Analytics) Fil(S) SD1 C165 26/6 2000

0013

#### A checklist of the rhopalocera (lepidoptera) of Mount Arayat, Pampanga, Philippines Cayabyab, Bonifacio F., Bayot, Rolando G., Padilla, Carlos L., Hardy, Peter D.

Short duration surveys of butterflies (Rhopalocera, Lepidoptera) of Mount Arayat, Pampanga were conducted in 1994-1995, 1997 and 1998. Forty-three species and sub-species under 30 genera in 6 families of the superfamily papilionoidea and 4 genera of the Hesperiidae (Hesperioidea) were observed. A taxonomic checklist is herein provided. (Author's abstract)

Keywords: Agriculture, Rhopalocera, Mount Arayat, Lepidoptera, Butterflies

The Philippine Entomologist, Volume No. 15 Issue No. 2, 143-150 (Filipiniana Analytics) Fil(S) QL461 P5 15/2 2001

### Coconut yield and profitability under two practical fertilizer options: common salt (sodium chloride) and multi-nutrient 14N-5P2O5-20K2O- 15CI-4.5S-0.02B applications on bearing trees (technology notes) Magat, S.S., Canja, L.H.

The indicative coconut yield and profitability in 5 yr cropping period or cycle under two fertilization options: 1) common salt (NaCI); and 2) multinutrient mineral fertilizer (MNF) was evaluated. It was based on the average coconut yield of the local tall variety grown in a suitable tropical wet climate growing zone of Davao, Southern Mindanao, Philippines (07°05'N 125037). Prices of production inputs as fertilizers and labor components, and the product copra are referenced to 2008 economic conditions.

Several economic indices generated (with the aid of MS-EXCEL software program) as annual gross returns, production costs, net returns and net present value (NPV) per tree and per hectare bases as influenced by the fertilizer applications under different price levels of copra (Php17.50 to Php30.20/kg) are presented. At the third successive year of fertilization, even at the lowest coconut copra price level of Php17.50/kg, the net returns per hectares are: (1) from unfertilized trees - Php19,849; (2) with the common salt (GSA) - Php25,294; and (3) with the multi-nutrient (MNF) - Php49,716. The MNF achieved the highest net present value (NPV) at 18% interest of Php118,918 (5 yr cropping) - a considerable difference of Php44,785 over the GSA, indicating that the NPV of MNF application is 60.4% higher.

Generally, results showed a lower investment cost with common salt application over the MNF, but clearly higher and significant coconut (copra) yield, net returns and NPV (@ 18 % interest) are achieved with the application of multi-nutrient  $14(N)-5(P_2O_5)-20(K_2O)-15(CI)-4.5(S)-0.02(B)$  mineral fertilizer during the 5-yr cropping. (Php48 = 1 USD) (Author's abstract)

Keywords: Agriculture, Chloride as coconut nutrient, Coconut fertilization, Common salt as fertilizer, Economics of coconut fertilization, Multi-nutrient N-P-K-CI-S-B fertilizer, Sodium chloride

Philippine Journal of Coconut Studies, Volume No. Issue No. , 9-23 (Filipiniana Analytics) Fil(S) SB401.C6 P45 v.38 2013

0015

#### Cocoon yield and quality of silkworm fed with leaves harvested from mulberry grown under conventional, LEISA, and organic agro-ecosystem manipulations *Caccam, Mabel, Mendoza, Teodoro*

Agronomic and physiological characteristics of mulberry plants, their effects on silkworm growth, Cocoon yield and quality, and other productivity and profitability measures were used as parameters to select better combinations of practices in mulberry growing in Northern Luzon,

yield the Philippines. Growth and of mulberry and silkworms were significantly different in the six agroecosystem manipulations, seasons of harvesting leaves, and rearing silkworms. Compared to other setups, total cocoon yields/ha were higher in LEISA I, Conventional II, Conventional I, LEISA II, and Organic Farming I based on higher effective rearing rates of silkworms, weight of mature larvae, single cocoon weights, and cocoon yield per box. Quality of cocoons, cocoon shell percentage, and reelability of cocoons also improved. Combined net incomes, return on investment, return above variable costs, labor and material costs (average of two years) were highest in LEISA I, Conventional II, LEISA II, and Conventional I. These agroecosystem manipulations can reduce the dependence of the silkworm grower on commercial fertilizers while increasing soil fertility. (Author's abstract)

Keywords: Agriculture, Low external input sustainable agriculture, Mulberry, Sericulture, Silkworm

Philippine Scientist: a scholarly journal for natural and physical sciences and mathematics, Volume No. Issue No., 68-96 (Filipiniana Analytics) Fil(S) Q1 J95 v.49 2012

0016

### Co-inoculation of mungbean with rhizobia and plant growth promoting rhizobacteria (PGPR) improves nodulation, dry matter yield and nitrogen uptake

Laylo, Glady Joyce C., Delfin, Evelyn F., Balancio, Pauline Nietzche P., Padua, Joyce Ann M., Montañez, Joemon O., Seares, Ken Bryl T., Vera Cruz, Carlos M., Paterno, Erlinda S.

Selection of superior strains of rhizobia and breeding of legumes for enhanced biological nitrogen fixation (BNF) are the common strategies utilized in improving nodulation and BNF in legumes. Recent findings however, showed the role of helper bacteria in promoting better nodulation and nitrogen fixation

A field experiment was conducted at the Institute of Plant Breeding-Crop Science Cluster, UPLB to evaluate the effect of co-inoculating rhizobia (Bradyrhizobium sp.) and plant growth promoting rhizobacteria (PGPR) on nodulation, dry matter yield, and nitrogen uptake of five mungbean varieties. The experiment used the split-plot design with three replications. Results showed that in general, mungbean plants that were inoculated with both rhizobia and PGPR had significantly higher primary nodule number and primary nodule dry weight, dry matter yield, and nitrogen uptake than plants treated with single inoculation of rhizobia. Dry matter yield and nitrogen uptake of mungbean inoculated with PGPR alone and dual inoculation of rhizobia and PGPR were found comparable. Dual inoculation with rhizobia and PGPR increased nitrogen uptake by 33% and primary nodule number formed by 50% when compared with plants inoculated with rhizobia alone. Treatment-variety interaction was not obtained in terms of the above parameters evaluated. The 5 mungbean varieties evaluated differed only in nodules formed. the number of Nodule occupancy study using agglutination technique showed that the proportion of crown root nodules occupied by the introduced *Bradyrhizobium* sp. strain was not affected rhizobia and PGPR coinoculation. by

The substantial increase in the amount of nitrogen uptake due to rhizobia and PGPR co-inoculation indicate an increase in nitrogen fixation activity with coinoculation. The results of this study have significant implication in improving legumes productivity in a sustainable manner. Hence, further evaluation of rhizobia and PGPR coinoculation under different soil types and cropping systems is being recommended. (Author's abstract)

Keywords: Agriculture, Dual inoculation, Rhizobia, PGPR, Mungbean, Nodulation, Nitrogen uptake

## Comparative analysis of coffee farming practices introduced by government and the private sectors in Paksong District, Champasak Province, Lao PDR *Phommasoulin, Vanthieng, Baconguis, Rowena T., Dizon, Josefina T., Jamias, Serlie B.*

This study examined the differences between the government-supported farmers (GSF) and the private-led farmers (PLF) in Paksong District, Champasak Province, Lao PDR in terms of investigating the support system available to them and adoption of recommended coffee farming practices. The study is important given the worldwide growth of the coffee industry and the resurgence of interest in coffee bean production. With the thrust of exploring the potentials of private sector to provide critical extension services, it is imperative to investigate the strengths and limitations of both the government and private sector.

While private extension is considered an efficient alternative to government, results showed that there is no distinct difference in terms of the strength of methodology and adoption of practices between GSF and PLF. Group extension, a strategy adopted by both the government and the private sector, shows promises of strengthening farmer power in facilitating the provision of needed support in information, credit and marketing. Moreover, given the fact that a large number of farmers do not adopt certain recommended farming practices, training of extension workers and farmer extension workers should be prioritized.

Promoting farmer's groups or training farmer leaders who will serve as extension workers might serve as a useful strategy to spread information and promote recommended practices given the geographical condition of the area. Interventions may be addressed through participatory and group methods where farmers themselves play a central role in the education and regulatory aspect of extension. While extensive educational support is given to farmers, the Lao coffee farmers still have difficulty penetrating the export market due to problems in meeting international quality standards. Complementation between the private and government sector in terms of standard setting and provision of support services is particularly important. (Author's abstract)

*Keywords:* Agriculture, Adoption, Extension support system, Private led extension, Participatory extension, Farmer education

Silliman Journal, Volume No. 50 Issue No. 1, 111-132 (Filipiniana Analytics) Fil(S) AS538 S46 50/1 2009

0018

#### Contribution to the taxonomy of Philippine megapodagrionidae (odonata:zygoptera) Gapud, Victor P., Recuenco-Adorada, Jessamyn D.

A new species of megapodagrionid damselfly, *Argiolestes baltazarae* Gapud & Recuenco-Adorada, is described from the Northern Sierra Madre Natiral Park, Philippines. The original description of *A.realensis* Gapud & Recuenco is modified to distinguish the two closely related species. The male of *Rhinagrion philippinum* (Selys) is described. Illustrations and a key to Philippines species of Megapodagrionidae are provided. (Author's abstract)

**Keywords:** Agriculture, Argiolestes baltazarae, Argiolestes realensis, Rhinagrium philippinum, Damselflies, Odonata, Megapodagrionidae

The Philippine Entomologist, Volume No. 15 Issue No. 2, 115-124 (Filipiniana Analytics) Fil(S) QL461 P5 15/2 2001

#### Control of the tobacco beetle, Lasioderma serricorne (Fabricius) (Coleoptera: Anobiidae), with carbon dioxide under high pressure Ulrichs, Christian, Mewis, Inga

Pressurized carbon dioxide ( $CO_2$ ) can control most important insect and mite pests within a few hours. Quick increase of pressure up to 20 bar for some hours and subsequent decrease to atmospheric pressure within a few minutes reduces the lethal exposure time to less than one hour. This short treatment time renders the method attractive for pest control and especially feasible for high value products like drugs of plant origin, spices, herbs, teas, tobacco, cocoa, beans, almonds and nuts.

Pressure-tight chambers of up to  $30\text{-m}^3$  volume are in use for short pest control, with CO<sub>2</sub> recapture to reduce the emission of the gas. The lethal effect seemed to consist of a combination of increased solution of CO<sub>2</sub> in the tissue of the insects leading to reduction of pH or increase of acidity as well as rupture of cell membranes following depressurization. Tobacco beetle, *Lasioderma serricorne* (Fabricius) causes severe losses in post harvest products and in the tobacco processing industry. Laboratory and practical results are presented describing the possibility to control this insect pest at various pressure of carbon dioxide at different temperatures. (Author's abstract)

Keywords: Agriculture, Carbon dioxide, Hig pressure, Lasioderma serricorne (Fabricius)

The Philippine Entomologist, Volume No. 14 Issue No. 1, 89-96 (Filipiniana Analytics) Fil(S) QL461 P5 14/1 2000

0020

### Corn in the Philippines: feeding the population beyond the present *Salazar, Artemio M.*

For the past several decades, white com consumption has been limited to Southern Philippines, mostly in Cebu area. And yet white com has a big potential to supplement the supply of food grain in the country. Nutritionally it is better than rice. Due to its "slow release" property, it is the staple of athletes and is recommended for diabetics. Com, a C4 plant, is also more efficient photosynthetically than rice, a C3. Being an upland crop, it is basically rainfed and therefore does not need expensive irrigation facilities which is a must in rice. Corn could also be grown even in marginal environments but certainly could yield very high under optimum growing condition. The grain, however, has the stigma of being the food of the poor. With proper information campaign, however, and hopefully, subsequent acceptance, white corn has a big potential to supply the staple grain need of the Filipino populace expected to be 200 million in year 2050. With our farmed area not expected to increase and the foreseen water crisis, com has a big role to play in our national economy and life. (Author's abstract)

Keywords: Agriculture, Corn, Consumption, Slow release, Rainfed, Information campaign

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 9 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

#### Creating a master plan for coconut sap sugar

The increase in the demand of the coconut sap sugar promises business opportunities for small farmers and small to medium enterprises. The Philippines being the pioneer for this product is at competitive advantage against Thailand in terms of volume and Indonesia in terms of quality. The increased demand of the product could be due to the high prevalence of diabetes and the growing interest to alternative sugar. Coconut sap sugar has a low glycemic index at 35 compared to other sugarcane-based sugars. It contains potassium, phosphorus, nitrogen and magnesium needed by the human body. The industry is growing and it has now at 60 business entities engaged in the coconut sap sugar business. Likewise, the product has been exported to Japan and the United States and is now considering export markets from other countries. An efficient value chain approach in business development is required to sustain the growth of the industry as well as standards and certification should be established to safeguard the industry.

Keywords: Agriculture, Coconut sap sugar, Diabetes, Potassium, Phosphorus, Nitrogen, Magnesium

Agriculture magazine, Volume No. 16 Issue No. 3, 8-9 (Filipiniana Analytics) Fil(S) S19 A 83 16/3 2012

#### Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)

Lapade, A. G., Asencion, A. B., Santos, I. S., Grafia, A. O., Veluz, A.M. S., Barrida, A. C., Marbella, L. J.

This paper summarizes the accomplishments, prospects and future plans of mutation, breeding for crop improvement at the Philippine Nuclear Research Institute (PNRI). Mutation induction has become a proven way of creating variation within a crop variety and inducing desired attributes that cannot be found in nature or have been lost during evolution. Several improved varieties with desirable traits were successfully developed through induced mutation breeding at PNRI. In rice, mutation breeding has resulted in the development of new varieties: (1) PARC 2, (2) Milagrosa mutant, (3) Bengawan mutant, and (4) Azmil mutant.

Mutation breeding in leguminous crops has led to the induction of improved  $L_{114}$  soybean mutant that is shorter than the original variety but yield about 40% more. Several PAEC mungbean varieties characterized with long pods that are non-shattering were also induced.

In asexually propagated crops, an increase in yield ,and chlorophyll mutants was obtained in sweet potato. Likewise, chlorophyll mutant which look-like "ornamental bromeliads" and a mutant with reduced spines have been developed in pineapple Queen Variety.

At present, we have started a new project in mutation breeding in ornamentals. Tissue culture is being utilized in our mutation breeding program.

In the near future, radiation-induced mutagenesis coupled with  $\underline{in}$  -  $\underline{vitro}$  culture techniques on protoplast culture and somatic hybridization and anther culture will be integrated into our mutation breeding program to facilitate the production of new crop varieties. (Author's abstract)

Keywords: Agriculture, PARC 2, Milagrosa mutant, Bengawan mutant, Azmil mutant

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No., 101-112 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

0023

#### Cuticle-degrading enzyme activity of *Metarhizium anisopliae* (METSCH.) Sorok. isolates pathogenic to asian corn borer larvae *Santiago, Dante R., Gabriel, Bernardo P.*

Isolates of *Metarhizium anisopliae* (Metsch.) Sorok., grown in liquid medium containing *Ostrinia furnacalis* (Guenee) larval cuticle as sole source of carbon and nitrogen, were assayed for production of extracellular protease, chitinase, esterase, lipase and presumptive chymoelastase. Correlation studies revealed inverse relationships between virulence, expressed as median lethal time in a day, and protease, chitinase, esterase and presumptive chymoelastase activities. Virulence did not correlate with lipase production. Although the implication of individual enzymes in virulence is quite evident, the patterns of enzyme production, expressed as percent maximal activity, could not clearly account for the differences in virulence among the isolates. In contrast, variation in mean percent maximal activity, representing the overall enzyme production of each isolate, paralleled the differing virulence among isolates, indicating that the whole cuticle-degrading enzyme machinery, rather than the individual enzymes, determines virulence. (Author's abstract)

Keywords: Agriculture, Metarhizium anisopliae, Ostrinia furnacalis, Cuticle-degrading enzymes, Virulence factor

The Philippine Entomologist, Volume No. 14 Issue No. 1, 15-29 (Filipiniana Analytics) Fil(S) QL461 P5 14/1 2000

0024

#### Damage assessment of lepidopterous pests of onion in Nueva Ecija

Cayabyab, Bonifacio F., Padilla, Carlos L., Ebuenga, Melvin D., Bayot, Rolando G., Adorada, Jjessmyn R., Peñalba, Fredelino, Perez, Emma P., Aquino, Alicia G.

The lepidopterous pests, of onion which are leaf chewers were studied during the 1999 growing season. The pest group in Nueva Ecija includes cutworms, earworms, semi-loopers, and new lepidopterous pest of onion. The cutworms are the dominant species.

Approximately 20% of red pinoy yield is reduced due to the damaged caused by these lepidopterous pests. The sampling protocols and details of the result are discussed. (Author's abstract)

Keywords: Agriculture, Lepidopterous pests, Cutworms, Damage assessment, Onion, Red pinoy, Leaf chewers

Transactions of the National Academy of Science and Technology, Volume No. Issue No. , 291 (Filipiniana Analytics) Fil(S) Q149.P5 N25 v.22 2000

#### First description of the male of *Heteropoda cyperusiria* barrion & litsinger 1995 from the Philippines (Araneae: Sparassidae: Heteropodinae) *Barrion, Alberto T., Jaeger, Peter*

The male of *Heteropoda cyperusiria* Barrion & Litsinger 1995 is described for the first time. New locality records for a male and two females of the same species are reported. One additional female provisionally identified as *Heteropoda* sp. seems to belong to another species. It is likewise described, illustrated and diagnostic characters and systematic position in the genus *Heteropoda* are discussed. (Author's abstract)

Keywords: Agriculture, Sparassidae, Heteropodinae, Male Heteropoda cyperusiria, Heteropoda sp.

The Philippine Entomologist, Volume No. 15 Issue No. 1, 37-43 (Filipiniana Analytics) Fil(S) QL461 P5 15/1 2001

0026

#### A descriptive model of cropping decision making application to crop diversification in irrigated rice farms

#### Gonzalez-Intal, Miren, Valera, Jaime B.

The research sought to model the cropping decision making of farmers vis-a-vis diversified crops. A three-stage descriptive model of cropping decision making under uncertainty was developed. The model, which is a modified version of Gladwin's (1980) decision tree model, was tested in six case studies of successful crop diversification in irrigated rice farms. The six case studies consisted of tobacco farming in San Fabian, Pangasinan; cotton growing in Urdaneta and Manaoag, Pangasinan, tomato growing in Sta. Barbara and Mapandan, Pangasinan; mungbean farming in Manaoag and Urdaneta, Pangasinan; onion growing in San Jose, Nueva Ecija; and garlic, corn, and peanut growing in Laoag, Ilocos Norte. A total of 266 farmers from the different sites were interviewed. Overall, the cropping decision model found empirical support tree in the various cases except for the mungbean case which was not a free choice situation and for the corn and peanut cases which were not the major diversified crops of the farmers but only subsidiary crops. Results indicate that the cropping decision tree model is applicable to the choice of a major diversified crop involving a free choice situation. The model appears promising as a diagnostic guide which can be used by change agents for determining whether or not farmers are ready to crop diversify. (Author's abstract)

*Keywords:* Agriculture, Tobacco farming, Cotton growing, Tomato growing, Mungbean farming, Onion growing, Garlic growing, Corn growing, Peanut growing

### Design and development of non-refrigerated storage system for selected fruits and vegetables

### Miranda, Lorena N., Guadalupe, Alvin P., Yaptenco, Kevin F., Amatorio, Emmanuel Q., Masilungan, Gloria D., Manalabe, Ruben E.

Mechanical refrigeration is the most effective method in maintaining the quality of fruits and vegetables. However, due to high installation and operating costs involved, the adoption of refrigeration is still limited especially for small farmers, traders and retailers.

A simple and inexpensive cooling technology was developed. The cooler uses the principle of evaporative cooling with the 20-cm thick charcoal as cooling pad. Charcoal was selected as the best alternative cooling pad among the three local materials evaluated because it has the highest evaporative cooling efficiency, lowest resistance to air and better material performance.

Two prototype designs were fabricated and tested, namely, display-type and cabinet-type evaporative cooler. The prototype evaporative cooler can reduce the ambient temperature by 2.1 to  $6.3^{\circ}$ C and raise the relative humidity by 12.4 to 36.5 percent. The humidification efficiency of the display-type cooler ranged from 74.3 percent to 81.5 percent and 93.5 to 99.3 percent for the cabinet-type. The displaytype had an average water consumption of 1.1 L/hr whereas the cabinet-type had an average consumption of 1.8 L/hr.

Commodities placed in the evaporative cooler have better visual and textural quality than those samples left in the ambient due to reduced moisture loss. Evaporative cooler can increase the shelf-life of selected fruits and vegetables by one to four days. Commodities tested were eggplant, tomato, bitter gourd, pechay, cabbage, Chinese cabbage, sweet pea, green pepper, cucumber, 8aguio beans, string beans, calamansi and mangoes. Financial analysis showed that it is profitable to invest in the evaporative cooler. (Author's abstract)

**Keywords:** Agriculture, Mechanical refrigeration, Charcoal, Display-type evaporative cooler, Cabinet-type evaporative cooler

PhilMech Journal: post harvest engineering, Volume No. 1 Issue No. 1, 82-105 (Filipiniana Analytics) Fil(S) S698 P45 1/1 2010

0028

#### Determination of weight percentage moldy corn kernels from bulk samples using flatbed scanner Bulaong, Manolito C., Madamba, Ponciano S.

A computer vision system for determination of weight percentage moldy kernels (WPMK) of corn (Zea mays L.) from bulk samples was developed. The system consists of a flatbed scanner and a desktop computer equipped with an image processing and artificial neural network (ANN) softwares. Images of bulk samples of corn with various levels of moldy kernels were taken using a flatbed scanner under a blue background with backlighting to eliminate shadows. Color and texture features were extracted from corn images and used as inputs for training, validation and

testing of models based on canonical discriminant analysis (COA) and ANN. The ANN performed consistently better than CDA in classifying corn grains into different WPMK levels. The ANN model based on color features extracted from red, green, and blue (RGB) histogram and texture features extracted from hue, saturation, and brightness (HSB) color space obtained the highest correlation coefficient ( $r^2$ ) of 0.90 to 0.99 between predicted and actual WPMK. The study proved that a flatbed scanner can be used as a low-cost alternative to digital camera for estimating WPMK from images of bulk corn samples. (Author's abstract)

**Keywords:** Agriculture, Weight percentage moldy kernels (WPMK), Zea mays L, Artificial neural network {ANN} softwares., Correlation coefficient

PhilMech Journal: post harvest engineering, Volume No. 1 Issue No. 1, 32-43 (Filipiniana Analytics) Fil(S) S698 P45 1/1 2010

0029

#### Development and incidence of *Neozygites fresenii* (Nowakowski) remaudiere & Keller (Zygomycetes: Entomophthorales) in aphis craccivora koch and its pathogenicity to three other aphididae (Hemiptera)

Mejia, Belen S., Villacarlos, Lina T., Ceniza, Ma. Juliet C.

Laboratory and field experiments were conducted to examine the development, pathogenicity and incidence of *Neozygites fresenii* (Nowakowski) Remaudiere & Keller in *Aphis craccivora* Koch infesting some legumes in the Visayas State college of Agriculture, Baybay, Leyte. Based on squashed mounts of *N. fresenii*-inoculated aphids, it took only 54 h post-inoculation for the aphids to succumb to mycosis. Developmental stages according to initial occurrence were protoplasts, hypal bodies, conidiophores, primary conidia and capilliconidia. Three other aphid species were inoculated with capilliconidia of *N. fresenii* from *A. craccivora*. The most susceptible was *Aphis citricola* van der Goot followed by *Brevicoryne brassicae* (L.) with an average mortality of 53% and 41%, respectively, after five days incubation. Only 28% of *Rhopalosiphum maidis* (Fitch) were killed by mycosis after the same period. Results from the weekly monitoring of *A. craccivora* on bush bean, string beans and mungbean, indicated that less than 30% of the aphid samples were infected at the beginning of the first cropping season, but this gradually increased with time on all vegetable legumes. In the second trial, there was over 60% infected aphids recorded at the start of the season. On the other hand, the biweekly incidence of *N. fresenii* in aphids on *Gliricidia sepium* (Jacq.) Steud. was consistently high, ranging from 53-100% throughout the observation period, except after several days of intermittent rains. (**Author's abstract**)

Keywords: Agriculture, Aphids, Aphis craccivora, Entomopathogenic fungi, Entomophthorales, Incidence, Mycosis, Neozygites fresenii

The Philippine Entomologist, Volume No. 14 Issue No. 1, 37-48 (Filipiniana Analytics) Fil(S) QL461 P5 14/1 2000

0030

Development of a computer vision system for milled rice quality analysis Bulaong, Manolito C., Agustin, Oli

The computer vision system (CVS) was developed as an alternative to the tedious, subjective, and slow method of manual milled rice analysis. It is composed of a document scanner and a computer with image-processing software. The scanner acquires the image of a milled rice sample and the computer predicts quality parameters such af weight, size. percent headrice. brokens. brewers. and defective as grains. It also gives the grade of the sample based on the existing Philippine Grain Quality Standards. Several computer models were built as part of the image processing software including weight prediction, size measurement, color-related and quality classification.

The weight prediction model gave a correlation coefficient of 0.98 with projected area of the grain .. The model to predict the percent by weight of headrice, brokens, and brewers gave an overall accuracy of 99 percent. A model using the artificial neural network (ANN) predicted six milled rice quality parameters with coefficient of multiple determinations ( $R^2$ ) of 0.97 for sound, 0.73 for damaged, 0.94 for chalky/immature, 0.96 for discolored, 0.94 for red kernels, and 0.92 far paddy using the test set of images. Based on speed, accuracy and repeatability tests, the CVS performed better than manual method of analysis. (Authors abstract)

**Keywords:** Agriculture, Computer vision system (eVS), Artificial neural network (ANN), Philippine Grain Quality Standards

PhilMech Journal: post harvest engineering, Volume No. 1 Issue No. 1, 44-61 (Filipiniana Analytics) Fil(S) S698 P45 1/1 2010

0031

### Development of high yielding and bunchy top virus resistant abaca (*Musa textilis* Nee) cultivars

### Lalusin, Antonio G., Manguiat, Proceso H., del Rosario, Edwin E., Dizon, Teodora O., Laurena, Antonio C., Mendoza, Evelyn Mae T.

Abaca (Musa textilis Nee.), a plant endemic to the Philippines, is the source of fiber known internationally as Manila hemp. It is often used as raw material for cordage, clothing, various handicrafts, specialty papers such as currency notes, filter papers, stencil papers, tea bags among others. The abaca industry is a major dollar earner of the country. Due to the current concern for biodegradable products and forest conservation, it is expected that the abaca industry will continue to flourish in both domestic and international markets. With the advent of new uses of abaca, the crop will be extensively utilized for more industrial applications because it is a natural and superior material. However, the abaca industry is still relying solely on traditional varieties for its survival. One reason for the decline in the abaca industry is the limited attention devoted to varietal improvement. The old abaca varieties have become susceptible to bunchy top virus disease. This study aims to develop abaca varieties with high fiber quality and resistance to abaca bunchv top virus through conventional breeding.

In 1981, the Institute of Plant Breeding (IPB), resumed work on the abaca breeding program started at the Division of Plant Breeding in the late 1950's. Crosses between abaca and its wild relatives were produced. In 1986, six F1 hybrids between Pacol and abaca were released. These hybrids have resistance to bunchy top virus but of inferior fiber quality. To recover the superior fiber qualities of abaca, several backcross (BC1) lines were generated but crossing work was ended due to unavailability of funds. It was only in 2006, that the breeding work was continued although to a limited extent, and several BC1 crosses were evaluated. BC2 progenies, produced from cross-pollinating four promising backcross lines (BC1) and two abaca varieties as recurrent parents were established in the field for screening of virus disease resistance and evaluation of fiber quality. Four BC2 populations were generated from the following crosses: 'BC1-19 X Abuab', 'BC1-20 X Abuab', 'BC1-21 X Abuab' and 'BC1-19 X Musa tex 51'. One hundred sixty six (166) inoculated seedlings (12 from BC1-19 X Abuab; 132 from BC1-20 X Abuab', and 22 from 'BC1-19 X Musa tex 51) were selected for field planting based on bunchy-top virus resistance, plant vigor and resemblance of morphological characters to true

abaca. Characterization of agro-morphological traits was initiated on mature BC2 plants. The BC2 progenies were compared to the abaca parent on the following traits: plant height, plant diameter, fresh weight of stem, number of leaf sheaths and dry weight of fiber. Other visible traits indicative of resemblance to the true abaca were also observed. Abaca fiber samples were collected from each of the characterized BC2 plants and processed for determination of fiber quality. Data on fiber length, fiber recovery and fiber breaking load of BC2 selections were gathered. Superior BC2 segregants exhibiting good fiber qualities and desirable agro-morphological traits were selected for multilocation testing and clonal propagation. (Author's abstract)

Keywords: Agriculture, Abaca (Musa textilis Nee.), Abaca bunchy top virus (ABTV), Abaca fibers, BC1- first backcross progeny

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 14-15 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### 0032

#### Development of improved varieties of mungbean (NSIC Mg14 and NSIC mg15) Jarilla, Flora A., Buctuanon, Eugenia M., Alonzo, Ma. Anna M.

Mungbean is one of the popular and important 4crops in the Philippines. It can be processed into noodles, "togue", delicacies, novelty products etc. Its importance in agriculture and industry becomes the basis to conduct varietal development at BPI-LBNCRDC.

Promising lines of mungbean were field evaluated under the Preliminary Yield Trial (PYT) in 1996 to 2000 and General Yield Trial (GYT) in 1997 to 2004. Potential varieties from the GYT were further screened in different regions of the country under the National Cooperative Trial (NCT) in 2002 to 2006. Evaluation was conducted to screen and develop varieties with high bean yield, early and uniform maturity, resistant to lodging/shattering and resistant to natural occurrence of pests.

Based on the outstanding performance on-station/across locations, two (2) varieties were approved and released by the National Seed Industry Council (NSIC) in 2004 and 2007 as seedboard varieties for commercial production. Lines EGM 93-266 was approved in 2004 as NSIC Mg14 with local name "Kulabo" and EGM 93-293 as NSIC Mg15 locally named as "Kinang" in 2007.

A total of 217.45 kg breeder and foundation seeds of NSIC Mgl4 and NSIC Mg15 were distributed by BPI-LBNCRDC in different regions of the country. Bulk of the distribution amounting to 168.95 kg was recorded in Region 4 particularly in Los Ba $\tilde{A}\pm os$ , Laguna. (Author's abstract)

**Keywords:** Agriculture, Preliminary yield trial, General yield trial, National cooperative trial, National seed industry council, Varietal improvement

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 15-16 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Development of Philmech rice hull-fed furnace system for heating mechanical dryers Martinez, Romualdo C., Flores, Edgar D., Asuncion, Nestor T., Daquila, Robelyn E., Viloria, Wryan Quiel Z., Manalabe, Ru

The PHilMech developed a rice hull-fed furnace system to solve problems of current furnace designs. It has the following features: an automatic feeding of rice hull, an air tube type heat exchanger, a fly ash scrubber to control emission of fly ash particulates, and a temperature controller. Performance evaluation results showed that the furnace system attained efficiency of 50 to 59 percent with rice hull consumption ranging from 23 to 24.5 kg/h when retrofitted to a single batch recirculating drver and from 40.5 to 46.8 kg/h when retrofitted to two dryers. The obtained furnace efficiency met the 50 % minimum level set by the Philippine Agricultural Engineering Standard for indirect fired heaters. Emission level of fly ash particulates was maintained at 15.1 mg/NCM which was way below the maximum of 200 mg/NCM NESSAP limit set by DENR. Comparative analysis showed a reduced cost of drying fram PhP 45.73 to Php 47.09 per bag using kerosene as fuel down to PhP 24.36 to Php 27.01 per bag when retrofitted to single batch recirculating dryer and down to PhP 21.34 to Php 22.92 per batch when retrofitted to two dryers. Replacement of kerosene burners with furnace systems made the mechanical grain dryers more attractive alternative to sundrying. (Author's abstract)

**Keywords:** Agriculture, Rice hull-fed furnace system, Automatic feeding of rice hull, Air tube type heat exchanger, Fly ash scrubber to control emission of fly ash particulates, Temperature controller

PhilMech Journal: post harvest engineering, Volume No. 1 Issue No. 1, 1-20 (Filipiniana Analytics) Fil(S) S698 P45 1/1 2010

#### 0034

#### Diagnosis and control of porcine epidemic diarrhea: case report Montenegro, M.M., Hipolito, G.G., Dimacali, M.C., Guzman, G.M.

An outbreak of severe watery diarrhea inneonatal piglets was reported by 3 commercial farms with a combined population of 7000 sows between the months of May and August 2005.

The disease outbreak high was characterized by rapid spread and very pre-weaning mortality which ranged from 80 to 100 percent.

Forty per cent of pregnant sows exhibited scouring 3 days before farrowing.

After farrowing the sows were lethargic, inappetent and developed mastitis and agalactia.

Nursery and growing finishing pigs were not affected .

Serum samples from sows and piglets of the 3 herds tested positive to Porcine Epidemic Diarrhea (PED) using the ELISA test.

Chopped or ground intestines and stools of scouring piglets was mixed with water to produce a broth and fed to all boars, pregnant and non-pregnant sows and gilts to spread the virus and stimulate natural immunity.

Litters of sows fed the chopped intestine broth 3 weeks before farrowing did not develop diarrhea and were successfully weaned.

Recrudescence was observed in 2 herds where feedback of the 'broth ' to the breeding herd was not immediately

completed.

The disease outbreak was declared over, when no affected litters were farrowed for 4 weeks. (Author's abstract)

Keywords: Agriculture, Porcine epidemic diarrhea (PED), ELISA test, Mastitis, Agalactia

Animal Husbandry & Agricultural Journal, Volume No. 40 Issue No. 4, 8-10 (Filipiniana Analytics) Fil(S) SF1 A54 40/4 2006

0035

#### Drying of mestizo 1 and mestizo 3 hybrid rice seeds

#### Martinez, Romualdo C., Lavarias, Jeffrey A., Cantre, Melanie Aileen T., Flores, Edgar D., Daquila, Robelyn E., Manalabe, Ru

Thin-layer drying experiments using 30 °C to 60 °C were conducted to establish the thin -layer drying characteristics and influence of drying temperature on germination of Mestizo 1 and Mestizo 3 hybrid rice seeds, Thin-layer drying equations were developed, based on the Page model, to describe the thin-layer drying behavior of Mestizo 1 and Mestizo 3. Mestizo 1 tended to dry faster than Mestizo 3, while both varieties appeared to dry slower than IR-64, but faster than u.s. grain. Germination test results showed that Mestizo 1 and Mestizo 3 were dried safely up to 55 °C, way above the 43°C commonly accepted safe drying temperature for seeds. An equation was developed, based on the Gompertz model, to describe the influence of temperature on germination. (Author's abstract)

Keywords: Agriculture, Mestizo 1, Mestizo 3, IR-64, Gompertz model

PhilMech Journal: post harvest engineering, Volume No. 1 Issue No. 1, 21-31 (Filipiniana Analytics) Fil(S) S698 P45 1/1 2010

0036

### Dwarf banana now tissue-cultured *Sarian*,

A dwarf version of the saba banana named "Mama Sita" from the Mama Sita Foundation is now being propagated through tissue culture for commercial planting. This variety which came from Thailand is typhoon resist ant compared to the local saba because of its height and has a much shorter growing period. The plant bears its fruits in 12 months from planting compared to Saba which takes 14-16 months. The dwarf banana can be eaten raw like latundan and it also excellent for making banana chips, hence, it has a good commercial potential.

Keywords: Agriculture, Banana, Tissue culture

Agriculture magazine, Volume No. 13 Issue No. 12, 44 (Filipiniana Analytics) Fil(S) S19 A 83 13/12 2009

#### Easy methods of propagating citrus *Tacio, Henryl*

Presented is the method by propagating citrus by means of budding using rootstock grown from seeds adapted by the Mindanao Baptist Rural Life Center Foundation in Kinuskusam Bansalan, Davao del Sur. These include seed extraction, seed treatment, seed bed preparation, sowing seeds to care of seedlings and managing the nursery. Citrus can also be propagated through cuttings and marcotting.

Keywords: Agriculture, Citrus, Vitamin C, Seed extraction, Seed treatment, Seed bed preparation

Agriculture magazine, Volume No. 13 Issue No. 12, 32-34 (Filipiniana Analytics) Fil(S) S19 A 83 13/12 2009

0038

### An easy way to germinate sago palm seeds found *Abello*,

Sago palm (*Metroxylon sago*) contains starch deposits in its trunk which has high food value and potential industrial use. The sago palm is also good source of shingles as roofing materials for light houses or huts. Seed germination of sago was found to be difficult because of its pericarp and sarcotesta so this prompted research to be conducted at the Aklan State University using the embryo rescue technique that resulted in the successful development of an immature or weak embryo into a viable plant *in vitro*. Aside from tissue culture, the researchers used sucker as planting material to determine the optimum conditions required to reduce mortality rate at seedling stage.

Keywords: Agriculture, Sago palm seeds, Germination, Metroxylon sago, In vitro, Pericarp, Sarcotesta

Agriculture magazine, Volume No. 13 Issue No. 2, 9 (Filipiniana Analytics) Fil(S) S19 A83 13/2 2009

0039

#### The economic impact of FMD and its control in the Philippines

Randolph, Thomas F., Perry, Brian D., Canda-Benigno, Carolyn, Santos, Imelda J., Agbayani, Amelia L., Coleman, Paul, Webb, Raymond F., Gleeson, Laurence J.

	The	authors	evaluated	the	impact	of	foot	and	mouth	disease	(FMD)	and	its	control	in
the		Philippines					using				cost-benefit-analys				

A scenario in which FMD control continues at recent levels with continued presence of the disease is compared scenarios which publicity-funded program achieves to in а eradication by 2005 (current policy objective), by 2007. and by 20 10.

trade Under varying assumptions regarding the development of export of livestock products following eradication, estimated Benefit-Cost Ratios for the investment in eradication range from 1.6 (2010, no exports) to 12.0 (2005, exports of 5000 tons of low-value and high-value livestock products annually) indicating eradication to be economically viable investment.

The commercial hog sector is estimated to capture 84 percent of the benefits generated by the public investmentineradication,versus4percentbackyardhogproducers.

The implications of these results within the context of regional FMD control efforts in South-East Asia are explored. (Author's abstract)

Keywords: Agriculture, Foot-and-mouth disease (FMD), Cost-benefit analysis, Livestock products, Livestock revolution

Animal Husbandry & Agricultural Journal, Volume No. 40 Issue No. 2, 13-28 (Filipiniana Analytics) Fil(S) SF1 A54 40/2 2006

0040

#### Effect of pretreatment on the structure and catalytic properties of rice hull-derived zeolites Paragas, Danila S., Gutierrez, Redel L., Salazar, Joel R., Gines, Michael O.

Rice hull was used as raw material for zeolite synthesis. It was pretreated with water and 1 M HC1 before ashingat 600 °C in a muffle furnace for 3 hours. Purity of the rice hull ashes was verified by their percent carbon content.Characterization of the zeolites were done using electron dispersive X-ray (EDX), scanning electron microscopy(SEM)andX-raydiffraction(XRD)spectroscopy.

The rice hull pretreated with water had 21:16 (Si:A1) framework ratio while that pretreated with acid had 23:17 (Si:A1) which could mean that the Si-A1 framework ratio of the samples could be about 1.3:1. SEM scans at 7500x magnification revealed that zeolites derived from rice hull ash pretreated with water had bigger pore sizes (2  $\mu$ m) than those od acid-washed (1 $\mu$ m) diameter.

The catalytic properties of the prepared zeolites were determined by spiking a water sample with 69.0 ppm of  $NO_3^-$  solution (the maximum tolerable limit of nitrate in water), loading it with 0.2 g zeolite per liter of solution and aliquots analyzed after 2, 3 and 4 hours. The zeolite derived from water-pretreated ash removed nitrate in water (99.11%) and is not significantly different from that obtained from acid-pretreated ash (99.26%) after 4 hours. Four comparison, commercial-grade zeolite was tested and was found to remove only 98.77% nitrate and is significantly different from the pretreated ones. Hence, pretreatment of the rice hull has an effect on the structure and catalytic properties of rice hull-derived zeolites.

Since water-pretreatment and acid-pretreatment yield zeolites that relatively remove nitrates in water, it is recommended that the former be employed for rice hull pretreatment. Study must be done also to determine the possibility of regenerating the zeolite after its use to remove nitrate. (Author's abstract)

Keywords: Agriculture, Rice hull-derived, Pretreatment, Zeolites, Catalytic, Nitrate

### Effects of age and needle length on the seroconversion and herd immunity of a commercial trivalent (O<sub>1</sub>, A<sub>24</sub>, C<sub>3</sub>) oil-based FMD vaccine

Canda-Benigno, Carolyn, De Mayo, Angeles, Verin, Blesilda, Santos, Josefina C., Linatoc, Marlon L.

This study investigated the effect of age and needle length on the seroconversion and population protection percentage (herdimmunity) of а trivalent  $(0_1$ Philippines,  $A_{24}$ and Cruzeiro  $C_3$ Philippines) oil-based commercial vaccine on pigs.

Some 93 pigs with age range from  $1\frac{1}{2}$  to 3 months were randomly distributed into three, which are as follows: control ( $\frac{3}{4}$ -inch needle), group 1 (1-inch needle) and group 2 ( $\frac{1}{2}$ -inch needle). All the pigs were vaccinated twice with a four-week interval.

before Blood collected the first vaccination (Day 0), at Day 28 and Day 56. was Serum then collected from each sample and tested for the antibody titer using the was ELISA Kit.

The results from the seroconversion antibody product of all the treatment or ion groups were analyzed using the ANOVA P<0.05 and Least Standard Difference (LSD). at

The control had protective titers against the three serotypes and high herd immunity percentages in both the  $1\frac{1}{2}$  month and 2 month age groups but had weaker antibody response for the 3-month age group.

Pigs 1<sup>1</sup>/<sub>2</sub> month 3 months of age of group I had protective antibody titers against and the three serotypes and high herd immunity percentage but two-month old pigs in the low response. group gave

Group 2 elicited high levels of protective antibodies and high herd immunity percentages.

Results showed that <sup>3</sup>/<sub>4</sub> inch needle length could be used in mass vaccination of animals from two months old and below.

However, a 1<sup>1</sup>/<sub>2</sub> inch needle should be used in mass vaccinating pigs from 2 months and older. (Author's abstract)

Keywords: Agriculture, Least standard difference (LSD), ELISA Kit, ANOVA, Foot-and-mouth disease (FMD)

Animal Husbandry & Agricultural Journal, Volume No. 40 Issue No. 4, 15-24 (Filipiniana Analytics) Fil(S) SF1 A54 40/4 2006

#### Effects of fertilizer on shoot emergence of four bamboo species Quimio, Jr., Marcos J., Gonzales, Lucas L., Calinawan, Roge

The study was done on kauayan-tinik (*Bambusa blumeana*), kauayan-kiling (*B. vulgaris*), bayog (*Bambusa. sp.*) and bolo (*Gigantochloa levis*). The fertilizers were 3 levels nitrogen in the form of ammonium sulfate (21% N), 1 level of phosphorus in the super phosphate (30%  $P_2$  O<sub>5</sub>) and 1 level of potassium in the form of muriate potash (60% K<sub>2</sub>O) and 6 levels of these fertilizer combinations (T-1, T-2, T-3, T-4, T-5 and T-6) were prepared. Results showed t hat of the 6 fertilizer combinations, T-1 or without nitrogen and phosphorus but with potassium was the least productive while T-6 or with nitrogen was the most productive in terms of shoots that emerged per clump of each of the 4 species, indicating that the use of fertilizer significantly increased the emergence of shoots and yield of culms compared to bamboos without fertilizer.

Keywords: Gigantochloa levis, Agriculture, Bamboo, Bambusa blumeana, B. vulgaris, Bambusa. sp.

Canopy International, Volume No. 26 Issue No. 6, 5, 9 (Filipiniana Analytics) Fil(S) SD1 C165 26/6 2000

0043

#### Effects of zinc and boron fertilization on the alleviation of poor crop growth in heavily limed two acidic soils Bandara, J.W., Samonte, H.P.

Screenhouse experiments were conducted to determine the effect of Zn and B fertilization on the alleviation of poor crop growth of corn in heavily limed Antipolo sandy clay and Luisiana sandy clay soils.

The Antipolo and Luisiana sandy clay soils are highly weathered aluminous ultisols. They are highly acidic (pH 4.6 and 4.9 respectively) with high exchangeable AI and very low available P.

Gradual increments of lime rate up to 5.0 tons/ha for Antipolo and 3.0 tons/ha for Luisiana soils significantly increased the growth of corn. Beyond these rates, growth gradually declined. However, with the addition of Zn at the rate of 8 kg/ha to the 7 and 9 tons lime rates in Antipolo sandy clay and to the 4 and 5 tons lime rate in Luisiana sandy clay, the growth reduction problem disappeared. In contrast, boron fertilization had little or no effect on the growth of corn at high lime rates in both soils.

With increasing line rates, exchangeable Zn and soluble B decreased. The same trends were observed on the concentration of Zn and B in corn tissues.

The optimum levels for 94% relative dry matter yield of corn on the Antipolo sandy clay were pH 5.35, 4.0 ppm exchangeable Zn and a tissue concentration of 18.5 ppm Zn. On a Luisiana sandy clay, 94% relative dry matter yield of corn was produced at pH 5.32, 3 .0 ppm exchangeable Zn and a tissue concentration of 17.5 ppm Zn.

It can be concluded that growth depressions at high lime rates on Luisiana and Antipolo sandy clay soils were due to Zn deficiency and it can be corrected by applying approximately 7 to 9 kg Zn/ha . (Author's abstract)

Keywords: Agriculture, Zinc fertilization, Boron fertilization, Corn, Sandy clay

### Emerging swine production technologies to keep pace with increasing population *Mateo, Javier P.*

This paper presents some analyses and recommendations on how the swine subsector, as it continues to dominate the livestock sector and hence make up a significant proportion of the agricultural landscape, can become a logical and potent springboard in addressing the demographic crisis in the country. It also provides a framework showing the vital link between population, poverty and food security, with the contention that unless poverty is significantly reduced, the goal to attain food security remains a distant reality. This paper further presents a comprehensive discussion and vital recommendations on the role of emerging swine production technologies in meeting the protein requirements of the present and future generations of Filipinos, as well as in providing livelihood opportunities to empower disadvantaged sector the poor and the of the society.

During the last 10 years, R&D programs and initiatives were able to generate scientific and technological breakthroughs, which have significantly contributed to the improvement of swine production in the country. These include, among others, genetic and reproduction improvement through artificial insemination (AI), nutrition and feeding management, and animal health care. However, much still needs to be done to maximize the potential of these technologies, particularly for the backyard raisers.

With a projected population of 111 million by year 2025, the swine industry in the next 22 years must triple its pork production (2.8 million MT by 2025) to meet the projected demand (2.3 million MT by 2025). The ultimate task ahead is for all industry players to be able to encourage and empower hog farmers and farmer organizations to attain increased productivity and production efficiency, improved product quality, and reduced production cost toward an efficient, viable, and sustainable swine industry. The interventions required from the industry players include: policy interventions; R&D/S&T interventions; technology/information delivery services; and market and support services.

Vital to this goal is the *political will* of each and every player - government and private sectors alike - to participate in a concerted effort to uplift the plight of backyard raisers in the rural areas who account for 77 percent of the current swine inventory. (Author's abstract)

**Keywords:** Agriculture, Swine, production technologies, Strategies, Genetic improvement, Artificial insemination, Nutrition, Feeding management, Animal health care

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 7-8 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

0045

#### Exclusion of *Planococcus lilacinus* (cockerell) from the list of Philippine bamboo pests based on field and laboratory studies *Lit, Jr., Ireneo L., Caasi-lit, Merdelyn T.*

The cacao mealybug, *Planococcus lilacinus* (Cockerell), has been recorded on Philippine bamboos since 1922. A 3-year nationwide survey did not yield any cacao mealybug specimen on any bamboo species. Simultaneously, a taxonomic study of bamboo mealybugs revealed nine (9) species but no *P. lilacinus*. Rearing and feeding

experiments showed that *P. lilacinus* would rather starve to death than feed on any bamboo species. Hence, bamboos are not among its many hosts and it should be deleted from the list of bamboo pests. (Author's abstract)

**Keywords:** Agriculture, Planococcus lilacinus (cockerell), Cacao mealybug, Bamboo pests, Bamboo mealybugs, Taxonomy, Survey, Feeding experiments

The Philippine Entomologist, Volume No. 15 Issue No. 2, 181-189 (Filipiniana Analytics) Fil(S) QL461 P5 15/2 2001

0046

#### Exploring the use of theater as an intervention tool for FMD control Llarena, Elaine C., Canda-Benigno, Carolyn

An informed public is easier to mobilize. With this premise, public awareness became a top priority in 2000 for the FMD Control Program. Assessment of the communication needs of the country showed that there is a need for localized approach in the communication campaign. Theater was one of the alternative medium hat communications specialists of the National FMD Task Force identified as a feasible, economical and effective medium in delivering the message to the grassroots. Communities of Northern Luzon, specifically the Cordillera, have a chance to watch a theater presentation for free and in their dialect. The messages of these theater presentations are focused on ways of preventing FMD and measures to be taken in case of FMD outbreaks. The theater presentations costs less compared to television, radio, print or billboard campaigns. (Author's abstract)

Keywords: Agriculture, FMD control program, National FMD task force, Bureau of Animal Industry, Public awareness

Animal Husbandry & Agricultural Journal, Volume No. 39 Issue No. 12, 22-24 (Filipiniana Analytics) Fil(S) SF1 A54 39/12 2006

0047

### Some factors affecting mass rearing of the *Vanda* thrips, *Dichromothrips corbetti* (priesner) (thysanoptera: thripidae)

#### Navasero, Marcela M., Hirao, Gliceria A., Navasero, Mario V., Santiago, Dante R.

The following factors affecting mass rearing of *Dichromothrips corbetti* (Priesner) were studied: 1) cold storage on adult lengevity and facundity, 2) substrate on oviposition, 3) substrate on pupation, 4) oviposition access time. Females of *D. corbetti* did not survive prolonged cold storage in the refrigerator at 10°C. Females that withstand cold storage for 10 days lived and reproduced for 25 days whereas those which survived for 20 days stayed alive for 15 days only and reproduction was markedly reduced. *Vanda* flower was the most preferred substrate for oviposition. Eggs were also laid on pods of *Phaseolus vulgaris*. Among the materials offered as pupation substrates, the triple-ply tissue paper significantly reduced pupation along the sides and corners of the zip-lock plastic cages. The optimum oviposition access time was 24h. (Author's abstract)

Keywords: Agriculture, Vanda thrips, Dichromothrips corbetti, Mass rearing

The Philippine Entomologist, Volume No. 15 Issue No. 1, 83-90 (Filipiniana Analytics) Fil(S) QL461 P5 15/1 2001

#### Farm application of radoimmunoassay technology in dairy cattle management Alejandrino, A. L., Mateo, A. B., Asaad, C. O., Malabayabas, B., de Vera, A. C., Ignacio, L. M., Deocaris, C. C., Herrera, M. S.

Monitoring of progesterone concentrations in milk of farm animals, using radioimmunoassay technology is presented in this report. This was instituted among dairy cows managed by dairy cooperatives under smallholder level in Sta. Cruz. and Pagsanjan, Laguna and Sariaya, Quezon (n=103), and under communal level in Pontevedra, Capiz (n = 48).

The authors observed that the measurement of progesterone in milk/plasma was proven useful as a diagnostic aid in dairy cattle production studies such as early pregnancy diagnosis; identification of fertile and abnormally cycling, suboestrus or anoestrus cows, and appropriate timing for breeding services especially at the postpartum period, Information obtained on the ovarian activity / reproductive status of cows has also been helpful in monitoring the effect of appropriate management intervention measures developed to improve dairy cattle production in the country. (Author's abstract)

Keywords: Agriculture, RIA technology, Radioimmunoassay technology, Progesterone in milk, Plasma

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No., 123-136 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

#### 0049

#### The fate of pesticides in rice paddy ecosystem using nuclear techniques *Tejada, A. W., Varca, L. M., Calumpang, S. M. F., Bajet, C. M., Medina, M. J. B.*

The fate of <sup>14</sup>C-carbosulfan was studied in a model rice paddy ecosystem. Carbosulfan was rapidly converted to carbosulfuran. Seventy hours after application on rice, the radioactivity . was distributed as follows: soil> water> plan t > fish> air.

Rice Fodders fortified with <sup>14</sup>C-carbofuran were fed to lactating goats. Carbofuran equivalents were traced in the different organs and tissues of the animal with the highest concentration in omental fat and in the liver. Carbofuran was metabolized and excreted in urine (77%), faeces (3%), and milk (1%).

The residues in water were taken in and bioconcentrated by fish. The highest concentration was found in fish entrails. Even ducks and chickens within the vicinity of the treated rice fields contained residues of pesticides. Ipomoea aquatica grown in treated paddy water contained residues of carbofuran with the highest uptake on the ninth day up to the thirteenth day and declined thereafter.

Residues of pesticides used in rice paddy were not detected in grains but post harvest treated rice grains contained high residues after treatment of the jute sacks as the usual practice in warehouses. Washing, however, greatly reduced the residues of <sup>14</sup>C-chlorpyrifos in grains by 67%.

Bound residues of <sup>14</sup>C - isoprocarb on soil were absorbed by rice plants and by the subsequent crop, water melon.

Due to some contamination of well water collected within the vicinity of the treated rice fields, the movement of monocrotophos, endosulfan and chlorpyrifos were evaluated in the field. Monocrotophos and endosulfan residues were rapidly lost in paddy water but significant amounts leached beyond the surface soil layer up to 175 cms depth. <sup>14</sup>C-Monocrotophos however, reached only a depth of 30 cm within 60 days on soil columns. Chlorpyrifos on the other hand was found up to 20 cm. depth six days after application of the insecticides. Adsorption on soil was 91 %, suggesting a strong affinity on soil, hence less leached. (Author's abstract)

Keywords: Agriculture, Carbosulfan, Carbosulfuran, Ipomoea aquatica, Chlorpyrifos, Isoprocarb, Monocrotophos

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No. , 141-154 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

#### The fecundity and fertility of field collected and corn stalk collected asian corn borer, Ostrinia furnacalis Guenee

### Belen, Josemari M., Cayabyab, Bonifacio F., Alantara, Edwin, Sumalde, Augusto, Gonzales, Pablito G., Cuaterno, Wilma R.

The mass rearing of the Asian com borer (ACB) for laboratory studies such as bio-assays depends largely on the availability of field collected gravid ACB females. Corn stalks are cut immediately by farmers and the land is prepared again for quick turn around practice. This ensures continuous planting with a short duration for stalks to remain in the field. The time to collect adult ACB is thereby shortened. The random cutting of stalks from the level bringing laboratory ground and these in the can partially problem solve this of ACB adults. on short supply

We compared the fecundity and fertility of field collected ACB's and those that emerge from randomly collected corn stalks from Barangay Sanatiago, Lubao, Pampanga from May to November 2007. The corn variety is SG75 which is susceptible to ACB attack. Five hundred seventy six female ACB's were field collected while 1,322 females and 1,697 males were collected from netted corn stalks that were placed inside mosquito nets. The percentage fecundity and fertility of field collected ACB's were 90.4% and 89.33 % while the stalk collected were 86.01 % and 75.19% respectively.

The use of corn stalks as alternative collection for ACB's is a viable alternative where quick turn around is done. (Author's abstract)

Keywords: Agriculture, Fecundity, Fertility, Asian corn borer, Field collected, Stalk, Corn

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 31-32 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Fertilizer management of arabica coffee during rejuvenation Marquez, Mario M., Colting, Rogelio D., Bernard, Henry

The old age of coffee trees coupled with. poor cultural practices contributed to drastic decline of the average yield in the region, thus rejuvenation was recommended. Long term fertilizer studies on Arabica coffee grown under pine were conducted at the Benguet State University Agroforestry project. Established Arabica coffee under pine of 18 - 20 years old were subjected to rejuvenation by bending and topping. New shoots sprouted from bended trees and were pruned to 6 sprouts per tree. The trees were applied with four kinds of organic fertilizers at a rate of 3 kilograms per tree once a year. Berries were harvested three years after rejuvenation and were evaluated for five consecutive years. Yield response of bended and topped coffee to different kinds of organic fertilizer varies every year of harvest. Application of goat manure yielded the heaviest fresh berries and green beans during the third year of harvest. However, yield varied during the succeeding years where combined application of 14-14-14 + chicken manure yielded the heaviest. Soil pH, organic matter, nitrogen and phosphorus contents of the soil were improved after three years of fertilizer treatment particularly from application of organic fertilizers. Another experiment using younger coffee trees were applied with different ratio of inorganic fertilizer and chicken manure was also done. Coffee bean yield was high from application of Chicken manure plus 1:2:1 inorganic ratio. (Author's abstract)

Keywords: Agriculture, Arabica coffee, Bending, Goat manure, Agroforestry

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 22 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0052

#### FMD information management system as a disease surveillance tool in FMD control and eradication program in the Philippines Santos, Imelda J.

The National FMD Task Force uses an information system in managing data re disease situation, vaccination, animal movement and status zone.

The FMD Information Management System gives accurate information on the situation of an area at the quickest possible time. (Author's abstract)

**Keywords:** Agriculture, Foot-and-mouth disease (FMD), National FMD task force, FMD information management system

Animal Husbandry & Agricultural Journal, Volume No. 40 Issue No. 3, 14-18 (Filipiniana Analytics) Fil(S) SF1 A54 40/3 2006

0053

Genetic diversity analysis of Philippine maize inbred lines using microsatellite markers Coronado, Nancy B., Josue, Alexander David L., Guzman, Peter S., Hautea, Desiree M.

The success of a maize hybrid breeding program relies on the systematic evaluation and selection of inbred lines as parents based on their heterotic patterns. Heterotic patterns (HP) can be established using diallele analysis but the process is tedious, time-consuming, and costly, particularly if many lines or populations are involved. Fingerprinting and diversity analysis of inbed lines using molecular markers could reduce the number of lines required for testing and time needed to establish heterotic patterns. Inbred lines developed at IPB-CA-UPLB were analyzed using SSR or microsatellite markers. Sixty maize SSR primers were used to analyze the diversity of the 33 yellow and 47 wllte inbred lines. NTSYS analysis based on Nei's dissimilarity coefficient revealed clustering of very closely related inbred lines. The results of the study could provide maize breeders relevant information as a guide in selecting potential inbred lines as parents in a hybrid-breeding program. (Author's abstract)

Keywords: Agriculture, Maize, Inbred line, Hybrid, SSR, Microsatellite, Fingerprinting, Heterotic

Transactions of the National Academy of Science and Technology, Volume No. Issue No., 305 (Filipiniana Analytics) Fil(S) Q149.P5 N25 v.22 2000

0054

#### Geographical distribution and frequency of albumin, transferrin, and α-2 microglobulin alleles among anglo nubian, native goats and their F<sub>1</sub> crosses *Bondoc, Orville L., Garcia, Beatriz R., Beltran, Elizabeth D., Rapusas, Maribel dR., Gomez, Bryan C.*

This paper reports the geographical distribution and the frequency of albumin (*Alb*), transferrin (*Tf*), and alpha 2 - microglobulin ( $S2\alpha$ .) alleles among the Anglo Nubian, Native goats and their F<sub>1</sub> crosses in Luzon Island, Philippines. The blood serum protein polymorphisms were obtained from heparanized blood samples of 718 goats from 32 farms in 18 provinces using the using vertical polyacrylamide gel electrophoresis (PAGE).

The frequency of *Alb*-A and *Tf*-A alleles was similar in the Anglo Nubian, Native goats and  $F_1$  crosses, ranging from 62 to 66%. The *S2a* -A alleles however, were highest in the Anglo Nubian (72%) than the Native (67%) and  $F_1$  crosses (62%). Native goats particularly adapted to the local subsistence level of management and environmental conditions and which have the largest number and highest density of goat populations in the country, represent a unique reservoir of genetic resources for their continuous genetic improvement. A high degree of similarity is found among Native goats in farms/provinces along routes accessible to large and popular public auction markets such as in Padre Garcia, Batangas and Urdaneta City, Pangasinan. Our data revealed a pattern of introgression of imported Anglo Nubian alleles in local programs to upgrade the Native goats in the countryside, probably originating from Department of Agriculture Regional Field Units (DA-RFUs) and/or institutional herds of major state colleges and universities. Analysis of the geographical distribution of blood protein alleles provided a clear picture and importance of Anglo Nubian introgression in strategically located goat breeding! dispersal centers to rapidly create and expand hybrid zones in an outward direction. Marketing routes, phenotypic preferences by goat farmers, adaptation to specific habitats and to production and management conditions are the main factors explaining the current distribution of various blood protein alleles of goats in the island of Luzon. (**Author's abstract**)

Keywords: Agriculture, Albumin, Alpha 2-microglobulin, Anglo nubian, Transferrin, F1 cross, Native goats

#### Growth performance and yield of selected strain (gift) nile tilapia (*Oreochromis niloticus* L.) in lowland irrigated ricefields integrated with azolla and mallard duck *Van Hove, Charles, Cagauan, Arsenia G.*

Nile tilapia (*Oreochromis niloticus* L.) is commonly cultured in the Philippines and has high consumer acceptability. Different Nile tilapia strains exist in the country and the genetically improved farmed tilapia (GIFT) selected strain is widely cultured at present. The pond performance of this strain is well documented but there is a lack of information on its performance in a wellmanaged lowland irrigated integrated rice-fish culture. Hence, our study evaluated the growth performance and yield of the selected GIFT strain in integrated rice-fish culture with (+) and without (-) herbicide and molluscicide (HM), azolla and duck.

Five treatments: conventional rice-fish culture (RFHM), rice-fish (RF), rice-fish-azolla (RFA), rice-fish-duck (RFD) and rice-fish-azolla-duck (RFAD) were conducted in fifteen 300-m2 plots with fish refuge in three cropping seasons. All treatments except RFHM were not applied with HM. GIFT strain Nile tilapia (density and weight: 10,000 fingerlings ha-l and 13-17 g, respectively) was cultured for 83 days. Mallard ducks (400 ha<sup>-1</sup>) were housed over the refuge while azolla served as in situ food for Nile tilapia. Treatment effects: HM, azolla and duck and the interaction of azolla and duck on growth and vield were analyzed.

After 83 days, the specific growth rate (SGR) of Nile tilapia in the treatment -HM was 33% higher than in the treatments +HM (p<0.0001) due to the strong effect of azolla and ducks based on three trials. Mean SGR from treatments +azolla was 21% higher than -azolla whereas treatments +ducks was 83% higher than -ducks (P<0.0001). Nile tilapia yield in the conventional rice-fish culture was 195 kg ha<sup>-1</sup> and increased by 33% +azolla; 1.9 times +ducks; and 2.2 times +azolla and duck (P<0.0001). These findings demonstrated that growth and yield of GIFT strain Nile tilapia in the conventional rice-fish system can be significantly increased by integration with azolla and duck and

without the use of herbicide and molluscicide.

Keywords: Nile tilapia, Azolla, Agriculture, Rice-cum-fish culture, Mallard duck, Natural resources management

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 27-28 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

#### 0056

#### Heat pump drying of onion (Allium cepa) Taclan, Lorcelie B., Gavino, Romeo B., Franco, Samuel S.

A heat pump drying system was used to determine the drying kinetics of onion. Onion is a heat sensitive crop requiring favourable dehydration process to preserve its organoleptic characteristics.

Drying kinetics of onion was described using the different stages of drying: initial stage, falling rate and at the constant rate. Results showed that onions had a constant drying rate at the falling rate, that is, at an operating temperature of  $50.0^{\circ}$ C and relative humidity of  $15.0^{\circ}$ .

Dehydration results also showed that moisture content of onion was from 83.0 % to 15.0% at moisture reduction rate of 0.029 kg/hr dried for 33.0 hours. Drying time and moisture loss was highly significant with  $R^2$ =0.97.

Favourable drying, thermal and dehumidifying efficiencies of the system contributed to a dehydrated onion with reduced colour degradation safe for storage. (Author's abstract)

**Keywords:** Agriculture, Heat pump drier, Latent heat, Sensible heat, Dehumidification efficiency, Thermal, Efficiency

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 47 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0057

#### Hull-imposed dormancy in rice Ferrer, Marilyn C., Rabara, Roel C.

Seed dormancy in rice is considered a valuable trait particularly in tropical areas as it serves as a mechanism to prevent germination in the field as the crop lodges in standing water. Factors such as rudimentary or physiologically immature embryos, impermeable seed coats and the presence of endogenous germination inhibitors are recognized as causing seed dormancy. Few studies have been conducted to indicate that impermeable seed coats are involved in dormancv which prompted rice the conduct of this study. In this study, eight rice varieties were used to determine seed hull impose dormancy in rice. Seed samples were subjected to dormancy breaking treatments: soaking in water for 24 h, clipping the seed tip, dehulling and heat treatment (50°C) for 5 days. Seed germination, vigor, coleoptile and radicle length were observed and measured. The eight rice varieties showed varying degree of dormancy (7 -83% germination). Results showed that seed dehulling (85-95% germination) and heat treatment (83-99% germination) were effective in breaking seed dormancy in all the varieties tested. Vigor was also high in seeds subjected to dehulling and heat treatment. However, longer radicle (52-74 mm) was observed in soaked seeds and in the control whereas longer coleoptile was observed in heat treated and soaked seeds. The study indicates that removal of seed hull and subjecting the seeds to 50°C improved germination. High germination in dehulled compared to undehulled seeds seems to indicated that dormancy in rice is seed hull-imposed. (Author's abstract)

Keywords: Agriculture, Rice, Seed dormancy, Seed hull, Germination, Scarification

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 44-45 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0058

### Improving quality and shelf-life of vegetables and fruits by evaporative cooling storage *Acedo, Jr., Antonio L.*

Fresh fruits and vegetables deteriorate in quality very rapidly after harvest due to high rates of water loss and senescent changes. These processes rendered rambutan fruits and pechay crowns unmarketable in 2-3 days of storage and banana, mango, tomato and sweet pepper, in 7-13 days at ambient (27-320 C.; 64-88 % RH). Using a simple box-type evaporative cooler (EC), a cool (23-28 0c) and humid (>90% RH) storage condition was established and inhibited fruit shrivelling and leaf wilting, reduced weight loss, retarded fruit ripening and rambutan pericarp browning, improved banana peel color quality, and as a result, prolonged shelf life considerably. However, the increased humidity favored disease infection in the later period of EC storage. Sodium hypochlorite washing

minimized disease incidence in tomatoes, sweet peppers, pechay, and mango. Ethanol application was ineffective but retarded ripening of fruits, except in bananas. In rambutan, ascorbic acid did not retard pericarp browning. EC storage and the various treatments employed had no adverse effects on the chemical and sensory quality attributes of stored produce. (Author's abstract)

**Keywords:** Agriculture, Vegetables, Fruits, Postharvest quality, Storage life, Evaporative cooling, High humidity, Hypochlorite, Ethanol

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 22 Issue No. 4, 71-75 (Filipiniana Analytics) Fil(S) T1 N21 22/4 1997

#### 0059

#### Improving the production of corn and rice with controlled availability fertilizer (CAF) in Pinatubo Lahar

#### Samonte, H.P., Manyzo, M., Ocampo, A.M., Kimura, K., Kanno, H., Ito, T., Mizuno, N., Kanazawa, S., Chino, M.

A program on accelerated restoration of the fertility status and productivity of lahar affected. agricultural areas is more practical and suitable since waiting for the natural regeneration of these parameters that are concomitant with differentiation of volcanic deposits to AC or ABC horizons would take a very long time.

The experiment was conducted to further evaluate the agronomic effectiveness of 100-day controlled availability N and K fertilizers on corn and rice. The experiment was conducted in shallow later tank plots measuring 6.3  $M^2$  for rice and 14  $M^2$  for corn at the Department of Soil Science, UPLB.

Grain yield of corn fertilized with 150CAF-150SP-100CAF produced significantly higher yield than the control and was slightly better than those receiving conventional fertilizers. The efficiencies of N fertilization were 10.4 and 8.4 kg grain/kg N, respectively for the CAF and conventional fertilizers. The efficiency of CAF was improved to 12.13 kg grain/kg N with complementary addition of 40 kg Mg/ha.

Corn plants which received 150CAF-150SP-100CAF were significantly taller at 27 and 49 DAP than those receiving equivalent amount of conventional fertilizers. These differences were further supported by the dry matter yields at the same growth stages indicating more effective release for nutrient supply and utilization of nutrients supplied by 100-day CAF.

Unfertilized rice and those receiving no iron fertilizer will not grow on pure shallow lahar beyond three weeks. Rice fertilized with 150CAF-150SP-100CAF also produced significantly higher yields than those applied with conventional fertilizers. Likewise, these yield increments were supported by the significant differences in dry matter yield. (Author's abstract)

Keywords: Agriculture, Corn, Rice, Lahar

NRCP Research Journal, Volume No. 3 Issue No. 2, 143-154 (Filipiniana Analytics) Fil(S) Q179.9 N323 3/2 1993

### In situ compositing of rice straw using embased inoculant and chicken manure Javier, Evelyn F., Santin, Corazon A., Rivera, Jesusa M.

Rice straw management is considered an important aspect in sustaining long-term fertility of soil in rice cropping systems in lowland paddies as it is the most available in the farm. Incorporation of fresh rice straw (RS) in the soil however initially immobilizes nutrients because of its high C:N ratio. Chicken manure (CM), on the other hand, is considered the most economically efficient type of manure due to its low C:N ratio. With the characteristics of CM and its availability in the farm, it could be a good decomposing partner, substituting the function of commercial inoculants that are still more expensive and not readily available in the market.

This study aimed to compare the effect of CM and EM-based inoculant in rice straw decomposition A 60-day pot experiment was conducted to determine the mineralization of N, P, and K, as well as Fe, Zn, and Mn in the soil. The treatments were (1) Control (untreated), (2) RS at the rate of 10t/ha (3) RS with CM as inoculant at the rate of 3:10 or 3 tons of CM to 10 tons of RS (RS+CM), and (4) RS with EM-based inoculant at the rate of 1:10 (RS+EMB).

The dynamics of  $NH_4$ -N is significantly higher in RS+CM compared with RS and RS+EMB. RS, with or without inoculants depressed  $NH_4$ -N concentration in the soil. The mineralization of N in RS+CM started at 48 days after incorporation (48DAI) while that of RS and RS+ EMB was not observed within sampling period. Phosphorus and potassium concentration in RS+CM were consistently higher than in RS and RSEM. Incorporating RS alone or in combination with CM or EMB, gave significantly higher Fe, Zn, and Mn than the Control but not among the RS treatments. Generally, CM is more effective in releasing plant-available nutrients from rice straw than the EMB. (Author's abstract)

**Keywords:** Agriculture, Chicken manure, Immobilization, Microbial inoculant, Mineralization, Paddy rice soils, Rice straw

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 26 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0061

### High incidence of land snails mortality at Mt. Arayat, Pampanga: an evidence of global warming

#### Cayabyab, Bonifacio F., de Lara, Ayolani V., Gonzales, Pablito G., Katimbang, Genaro A., Penalba, Fredelino P.

An unusually high mortality of three landsnails namely; Helicostyla ovoidea (Bruguire) Cyclophorus appendiculatus Pfiefer and Hemitrichiella segitera (Sowerby) was documented at the Magalang side of Mt. Arayat, Pampanga from March to June 2008. We initially observed half buried bleached dead snails from an upturned root of ipil-ipil, Leucaena leucocephla in March 2008. Further observation around this site showed various stages of these three snail species that were dead or dving. Bv June 2008 we noticed more snails dying even though they were already near and around the source of potable water in the watershed. The total mortality in decreasing order from a one square meter sample replicated four times in four different locations are as follows: H. segitera (100) > C. appendiculatus (34) > H. ovoidea (26).

The warm weather could have trigered the occurrence of disease causing microorganisms that led to the death of the said snails irrespective of ages and sexes. It has been reported that 2008 is the 10th warmest year on record. Also the nine warmest years occurred from 1998-2008. Residents at Bgy. Sto Ni $\tilde{A}\pm 0$ , Magalang and farmers near the observation sites mentioned unusual dry warm weather and lack of rainfall during late 2007 up to early 2008. (Author's abstract)

Keywords: Agriculture, Mt. Arayat, Snails, Mortality, Global warming, Disease
Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 32-33 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### The influence of body weight and diet on the ammonia excretion of the African catfish Clarias geriepinus Chato-Salvador, Ronelie, Laureta, Liberato V.

Three size groups of African catfish, *Clarias gariepinus*, with mean weights were 124.5 g (adult size group), 5.4 g (juvenile size group), and 1.1 g (fingerling size) were given two types of diets (trash fish and floating pellets) to determine the influence of body weight and diet on ammonia excretion. Highest weights specific excretion rate (5.23 mg NH<sub>3</sub>-N kg<sup>-1</sup> h<sup>-1</sup>) was obtained from juveniles and fingerlings fed with trash fish and lowest (0.24 mg NH<sub>3</sub>-N k<sup>-1</sup> h<sup>-1</sup>) among adults fed with commercial pellets. Regardless of diet given, post-prandial excretion rates at 28°C were generally higher among fingerlings and lowest in adults. Within same size groups, excretion rate was 50.84% higher among test animals fed with trash fish. Significant differences in ammonia excretion in relation to diet stresses the dissimilarities of the protein and amino acid requirements of the test group. The hourly ammonia excretion rated obtained in this study can be used to deter- mine the build-up of ammonia in ponds which could be exported to rivers and inland waters. (Author's abstract)

*Keywords:* Agriculture, Body weight, Diet, Ammonia excretion, Clarias gariepinus, Trash fish, Commercial pellets, Weight specific excretion rates, Pollution, Water quality, Post-prandial excretion rates

Transactions of the National Academy of Science and Technology, Volume No. Issue No., 302 (Filipiniana Analytics) Fil(S) Q149.P5 N25 v.22 2000

0063

#### Influence of boron-potassium fertilizer application on the occurrence of cracking in carrots (Daucus carrota Linn) Balaoing, Jose G., Lagman, Jr., Cirilo A.

The experiment was conducted in Banooy, Baculongan Norte Buguias Benguet Philippines occupying a total land area of 500 square meters where the experiment was laid out. Plot size was 1 x 5 square meters. The type of soil is clay loam with a pH value of 5.0. Final soil properties (pH, organic matter, nitrogen, boron and potassium) were significantly affected by the application of boron, potassium and their combination.

Yield of carrots was significantly affected by the application of boron and potassium and their combination. Higher yield was obtained on carrots applied with 3.0 to 4.5 ppm B and plants applied with 105 kg/ha to 140 kg/ha  $K_2O$ . Total yield is highest at 3.0 ppm B + 140 kg/ha  $K_2O$ . Marketable yield was significantly affected by boron and potassium application. Highest marketable yield was obtained on carrots applied with 3.0 ppm B. Significant higher vield was noted in plants applied with 140 kg/ha  $K_2O$ Application of 3.0 В 105 marketable ppm with kg/ha K<sub>2</sub>O produced the highest vield.

Significant differences on the number and percentage of cracked roots were observed as influenced by boron and

potassium application. Higher number and percentage of cracked roots were noted on carrots applied with higher rates of potassium while lower count and percentage of cracked roots were affected by higher rates of boron application. (Author's abstract)

Keywords: Agriculture, Craking, Fertilizer application, Influence, Occurence, Boron-potassium

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 21 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0064

#### The international and local scene in food irradiation and its relevance to future directions for food irradiation in the Philippines *Lustre, Alicia O.*

Information will be provided 011 the nature and magnitude of the control of postharvesl losses in onions and garlic from the application of irradiation. Control of losses is measured in storage and during post storage marketing of the commodities. Information will also be presented on market tests and survey of consumer reaction to irradiated onions.

The benefits of irradiation will be discussed in relation to the need to reduce postharvest losses in the food supply and to address consumer concerns over the safety of food due to the use of chemicals. (Author's abstract)

Keywords: Agriculture, Food irradiation, Food supply, Nature, Magnitude

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No., 159-166 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

0065

#### Invasion of the buff coconut mealybug (*Nipaecoccus nipae*) in U.P. Los Baıos campus, elucidation of the confounded ''mealybug burn'' damage and practical control *Caasi-lit, Merdelyn T., Lit, Jr., Ireneo L., Larona, Ariel R., Dizon, Teodora O.*

The buff coconut mealybug (BCM), *Nipaecoccus nipae*, is already all over the lower and the upper campuses at the UP Los  $Ba\tilde{A}\pm os$ , College, Laguna. It is alarming as nothing is being done on the continuous destruction of this newly introduced pest. The most affected are the ornamental palms that are the dominant landscape species around the campus. If left unabated, it is possible that the plant diversity inside the campus will be threatened. It is the aim of this paper to present the current infestation of BCM around the UPLB campus and to further elucidate the "mealybug bum" damage. It will also recommend measures to conserve the remaining species or encourage the replanting of resistant native palm species.

According to. the survey conducted by Lit *et al* (2006), this invasive BCM is already present in 64 plant species of agricultural and forest trees representing 14 plant families. This polyphagous pest was first noticed in 2001 on palm species, Araceae, specifically on palmera (*Chrysalidocarpus lutescens*) and the two species of fish-tail palms ('Pugahan', *Caryota cumingii* and 'Takipan', *C. rumphiana*). In 2002, the mealybug infestation was observed on

royal palm (*Roystonea regia*), coconut (*Cocos nucifera*) and bachia (*Dieffenbachia* sp.). These spread to several families like Lauraceae (avocado), Sapotaceae (caimito, chico) and Annonaceae (guyabano, atis) in 2003. The most resistant were those of the anahaw, buri and other thick-leaf palms belonging to the palm tribe Coryphoideae. The beautiful lines of royal palms, the scattered coconut trees and the disappearing fish-tail and bamboo palms in the lower campus were most affected.

BCM usually invades the older leaves first, continue to feed and reproduce then later transfer to younger leaves. Severe damage is observed when the lower leaves are already covered with sooty molds. As a result of continuous sucking (feeding) coupled with the presence of sooty molds, senescence is hastened resulting to wilting and drying of the leaves. The infestation level is most severe during the dry season and the population build-up is very fast due to the absence of natural enemies. Not even the superytyphoon "Milenyo" had arrested the population of this pest and they further continue to affect the vegetation around the campus after two years. (Author's abstract)

**Keywords:** Agriculture, Buff coconut mealybug, Nipaecoccus nipae, Exotic palms, Caryota cumingii, Cocos nucifera, Roystonea regia, Mealybug bum, Sooty molds

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 29-30 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0066

#### Kinetics of iron in the development of rapid screening technique for iron toxicity tolerance in rice

### Singh, Rakesh Kumar, Beebout, Sarah J., Elec, Venus H., Quimio, Celsa A., Mendoza, Rhulyx, Sajise, Andy G., Gregorio, Glenn B.

The establishment of reproducible, efficient and reliable screening technique is a pre-requisite in developing irontoxicity tolerant cultivars. An experiment was conducted under controlled conditions at International Rice Research Institute (IRRI) Phytotron facilities to standardize screening protocol in rice. Kinetics of iron transformation in different treatment combinations and plant's response served as bases for selection. About 300 ppm of reduced iron  $({\rm Fe}^{2+})$ form of sulfate  $(FeSO_4)$ optimum in the ferrous is to differentiate the tolerant from the sensitive rice cultivars. An acidic environment (pH 4.0) and the presence of chelator EDTA maintained considerable level of excess iron in the solution for five days. The screening technique was validated using 20 genotypes with known reaction to Fe toxicity. The genotypes were both screened in the phytotron using the standardized protocol and were also evaluated in iron toxic field. Variation in response to iron stress was observed among the genotypes in the phytotron that corresponded well to field observations. Leafbronzing scores measured 4 weeks after stress application in the phytotron showed a high correlation with the field bronzing score as well as grain yield in an iron toxic field. Hence, the use of culture solution-based standardized screening could be used as high throughput technique to identify Fe-toxicity tolerant genotypes in breeding programs. (Author's abstract)

Keywords: Rice, Agriculture, Iron concentration, pH, EDTA, Iron toxicity, Screening technique

# Limnocharis flava L. BUCH., and Salvinia molesta MITCHELL: potential threats to aquatic ecosystem in Luzon

#### Alforja, Emma M., Perez, Emma A., Barican, Juanito V.

*Limnocharis flava* L. Buch., locally known as "sandok-sandokan", belongs to family Butomaceae. Introduced from Tropical America, it was first collected in Java in 1870 and is now a native of Tropical Asia. *Salvinia molesta* Mitchell is a floating aquatic fern of South American origin. It has become a serious pest in parts of Asia, Africa, and Australia. Its presence in Hoilo was earlier reported and has spread to Luzon, Local folks call it "giant Azolla". Both weeds have infested lowlands rice paddies, while the latter has started invading swampy areas, irrigation canals, and waterways in Lucban. Ouezon threatening nearby towns.

Limnocharis flava has long triangular petiole crowding the base of the а at stout rootstock. Leaves are large, the blade somewhat rounded with a peltate base. Flowers are in umbels with stout peduncles 3 sepals 3 yellow petals. Fruits are round capsules with 14-34 carpels, maturing in 21-24 days after flower opening. Each carpel has 22.123 small. brown 10 black seeds.

with difficult-to-wet Salvinia molesta fragile horizontal floating as stems hairy leaves. It produces numerous sporocarps, which contain the megasporangia and microsporangia. Growths is rapid and a means of dispersal is through fragmentation of the stem occurring rather easily.

The capacity · of Limnocharis to produce tremendous numbers of small seeds production reproduce vegetatively through offshoot of the and to at the tip flower stalk make this plant potentially damaging. (Author's abstract)

Keywords: Agriculture, Limnocharis, Salvinia, Salvinia molesta, Limnocharis flava

Transactions of the National Academy of Science and Technology, Volume No. Issue No., 300 (Filipiniana Analytics) Fil(S) Q149.P5 N25 v.22 2000

0068

#### Management of banana Fusarium disease Provido, N

Presented are the steps in the eradication of *Fusarium* infestation in bananas. The Task Force Fusarium created in Region XI reported that a total 634.70 ha had been infested with the disease particularly in Davao del Norte and Davao City. The early detection of the disease is very important to prevent its spread. Information dissemination campaign is also needed to educate farmers on the management of the disease.

Keywords: Agriculture, Banana, Fusarium disease

Agriculture magazine, Volume No. 16 Issue No. 3, 62-64 (Filipiniana Analytics) Fil(S) S19 A 83 16/3 2012

## Mapping of the *Rf* gene of a cytoplasmic male sterile line of rice (*Oryza sativa* L.) developed from a mutagenized source

#### Agdaca, Cheryl D., Mendioro, Merlyn S., Nas, Tamerlane Mark S., Singh, Rakesh K.

The cytoplasmic-genetic male sterility (CMS) and fertility restoration system has proven to be the most effective method in hybrid rice breeding. CMS system is controlled by the interaction of cytoplasmic genes and Rf genes in the nucleus. The inheritance and location of the Rf gene governing the pollen fertility restoration of IR73328A, a CMS-WA line with a mutagenized cytoplasm source, were determined in this study. The  $BC_1$  population from a IR 73328A/IR 73330-83-1-2R/IR 73328A cross consisting of 202 individuals were evaluated for both pollen and spikelet fertility. The segregation for pollen fertility of the population followed the 1 sterile: 3 fertile ratio expected for duplicate gene action in a backcross population. Bulked segregant analysis was performed to screen for polymorphic SSR markers to be utilized in the construction of the molecular map of the two Rf genes. The DNA of 20 completely sterile individuals (0-1 % pollen fertility) and 20 fully fertile individuals (80-100%) from the population were pooled together to constitute the sterile and fertile bulks, respectively. The data from polymorphic markers along with the pollen fertility data were used to construct a linkage map with Mapmaker/Exp Ver. 3. Subsequent interval mapping done with Mapmaker/QTL revealed that one of the genes, Rf-4, is on the long arm of chromosome 10. It was determined to be flanked by SSR markers, RM6132 and RM171, in chromosome 10. It was detected to be 3.0 cM from RM6132 and 1.5 cM from RM171 (LOD = 13.08). The other Rf gene could not detected by the set of polymorphic markers used in this study. It was also confirmed that the STS marker S10019/BstUI was reliable for identifying a restorer line possessing the Rf-4 gene. Results of this study indicate that the genetic mechanism of fertility restoration in the mutagenized CMS-WA line, IR 73328A, does not differ from that observed in other CMS-WA lines. (Author's abstract)

**Keywords:** Agriculture, Cytoplasmic male sterility, Fertility restorer, Duplicate gene action, Interval mapping, Linkage map, Bulked segregant analysis

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 3 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0070

#### Mapping quantitative trait loci associated with resistance to preharvest sprouting in wheat *Rigor, Alex T., Anderson, James A.*

Preharvest sprouting (PHS) is the precocious germination of the grains in the spike following physiological maturity. In wheat, the main problem associated with PHS is reduction in end-product quality. White wheats are the most susceptible class of wheat to PHS whereas the red wheats have high levels of resistance due to the pleiotropic effect of the red color genes with dormancy. However, recent studies reported that several sources of resistance to PHS. are available in white wheat germplasm. Our objective was to map quantitative trait loci (QTL) associated with PHS resistance in a recombinant inbred population of 94 lines from a cross between Grandin\*5/ND614-A, an elite hard white spring wheat susceptible to PHS and NY6432-18/Clark's Cream 40-1, a soft white winter wheat selected for its high level of PHS resistance. Multiple intervals mapping analysis revealed seven QTL for PHS based on the combined data across eight environments over three years (2005-2007). The QTL on chromosomes 2D, 5A and 7A had LOD score  $\geq$  2.5 and were not associated with QTL for plant height and heading date. These three QTL jointly explained 39.4% of the phenotypic variation for PHS. Other QTL were found on chromosomes 1B, 4B, 6A and 6D that explained 2.1% to 14.2% of the phenotypic variation. A significant QTL x QTL interaction was found between the chromosomal regions in 1B and 2D that explained 5.5% of the phenotypic variation. Some of the QTL

found in this study may aid in marker-assisted breeding for improvement of PHS resistance in wheat. (Author's abstract)

Keywords: Agriculture, Preharvest sprouting, MAS, Marker-aided selection, Wheat, SSR

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 7-8 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0071

#### Microbial biomass as indicator of organic fertilizer mineralization in paddy soil Javier, Evelyn F., Santin, Corazon A.

Immobilization of nutrients in soil microbial biomass occurs during intensive microbial activity as a result of substrate-derived nutrients from plant or animal residues. Fluctuations in the size of the microbial biomass pool can, therefore, be considered as an indicator of increasing or decreasing nutrient availability. The nutrients immobilized in the cells of the soil microbial biomass are eventually made available for plant uptake by mineralization (Lynch 1983; Inubushi and Watanabe 1986).

This study aimed to: (1) determine the effect of applying different organic fertilizers such as rice straw (RS), rice straw with inoculant (RSEM), chicken manure (CM), wild sunflower (WSF), and commercial organic fertilizer (COF) in soil microbial biomass; (2) compare the dynamics of soil microbial biomass in pot and field experiment; and (3) determined the dynamics of soil microbial biomass in paddy soil transplanted with rice.

Microbial C:N ratio is greater in the pot experiment than in the field experiment. The mineralization of RS was observed at 28 days after incorporation (28 DAI) in the pot experiment while 21 DAI in the field experiment. Partial immobilization of RS in the pot experiment occurred at 42DAI. RSEM mineralized at 28DAI in the pot and 14DAI in the field experiment. Partial immobilization was observed in the field set up at 21DAI. Mineralization of CM and WSF was observed at 7DAI both in the pot and field experiment. Immobilization in CM and WSF occurs at 35DAI in the pot and 14DAI in the field set up. COF mineralized at 35DAI in the pot and 28DAI in the field. Dynamics of N<sub>Bio</sub> showed a decreasing pattern regardless of the treatments in transplanted rice soil.  $C_{Bio}$  on the other hand increased at the first week of transplanting then gradually decreased until 49 days after transplanting (49DAT). (Author's abstract)

**Keywords:** Agriculture, Immobilization, Inorganic fertilizer, Microbial C:N ratio, Mineralization, Organic fertilizer, Paddy soils

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 27 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0072

#### MMSU produces 2 million Jatropha seedlings for PNOC-AFC Pablico, Sosi

The seedling plantation is a collaborative project of the Mariano Marcos State University, Batac, Ilocos Norte and the Philippine National Oil Company-Alternative Fuels Corporation which is intended to produce considerable

amount of oil. *Jatropha* grows well even in degraded or extremely poor soils and in low or high rainfall. Likewise, it can be propagated from seeds and cuttings and can start producing fruits in 2 to 3 years after planting.

Keywords: Agriculture, Jatropha, Philippine National Oil Company-Alternative Fuels Corporation, Oil

Agriculture magazine, Volume No. 13 Issue No. 2, 34-35 (Filipiniana Analytics) Fil(S) S19 A83 13/2 2009

0073

### Molecular and phenotypic studies of resistance genes introgressed from wild tomato (Lycopersicon chilense) to cultivated tomato (Lycopersicon esculentum) against tomato leaf curl virus isolate from the Philippines

Tongson, Eden Jane U., Galvez, Hayde F., Hautea, Desiree M.

The *Tomato leaf curl* virus disease caused by the whitefly-transmitted geminivirus (WTG) seriously affects production and cultivation of tomato worldwide. Since no cultivar of tomato ever displayed resistance to leaf curl diseases, breeding efforts towards resistance were focused on utilizing wild tomato genetic resources. However, progress in breeding for resistance is slow because of the complex genetics of resistance and its variable expression to different isolates of the virus from different geographical areas.

Mapping for resistance genes against WTG and marker development have been done for marker-assisted breeding for ToLCV resistance. Three introgression Regions in tomato line FLA456-4 derived from wild relative Lycopersicon chilense were associated for resistance against WTG in Indonesia. The regions are putatively located in chromosomes 3, 6, and 11. The effectivity of these genetic factors was evaluated against Tomato leaf curl virus Philippines strain (ToLCPV), specifically with Los Baños isolate. By phenotypic characterization of the F<sub>3</sub> introgression families of FLA456-4 x CLN1466J cross, these regions were validated; with emphasis in chromosomes 3 and 11. Introgression lines that carry combinations of the three L. chilense-derived genomic from FLA456-4 represented these F3 families. segments are in

A (FLA456-4 x Super Apollo) $F_2$  population was also used for molecular characterization of the resistance genes against ToLCPV. In this mapping population, the introgressed regions in chromosome 3 and 6 were validated based on strong association (Likelihood Ratio 19.0 at P < 0.001) between the molecular markers that tag the *L. chilense* segments and the disease response of the population expressed as area under the disease progress curve (AUDPC) against ToLCPV-Los Baños isolate. By composite interval mapping, three quantitative trait loci (QTL) for resistance gene, RGA marker TO-32. The QTL with the largest effect (71.9%) was mapped in chromosome 6. Results of this study validate the whitefly transmitted geminivirus (WTG) resistance in tomato derived from *L. chilense*, in particular, the introgressed segments in chromosome 3 and 6 against ToLCPV-Los Baños isolate. **(Author's abstract)** 

Keywords: Agriculture, Tomato, Tomato leaf curl virus, Resistance, Mapping, Molecular marker

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 10-11 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

## Multiplex polymerase chain reaction for simultaneous detection of major mastitis-causing pathogens in buffalo milk

#### Paraguison, Rubigilda C., Kim, Sung Min, Lee, Hyeon Ju, Gutierrez, Charito A., Abes, Nancy S., Flores, Ester

В.

Clinical mastitis is one of the major diseases in the dairy sector and its incidence increases with lactation number or age. To efficiently treat and minimize its effect on dairy industry, a sensitive, rapid, and specific test for identifying the mastitis-causing pathogens is required. PCR-based method provides a promising option compared to bacteriological method. Recently, a more improved PCR method is being applied to simultaneously detect various pathogens in one assay. The use of the multiplex PCR (mPCR) capable of detecting simultaneously four of the most common mastitis-causing pathogens in milk including Staphylococcus aureus, *Streptococcus agalactiae*, *Streptococcus dysgalactiae*, and *Streptococcus uberis was tested directly from DNA isolates of buffalo milk*. Twenty five milk samples tested for mPCR were based on California Mastitis Test (CMT). Sensitivity of mPCR was assessed by comparing the results from bacteriological culture. Fifty six percent (56%) matches the results from both methods while 44% were detected positive in mPCR but no growth in the culture. This study suggests that mPCR can be a practical tool for rapidly diagnosing mastitis-causing pathogens in milk. This would mean significant improvements in the disease control and accurate decision for treatment. (Author's abstract)

Keywords: Agriculture, Buffalo milk, Mastitis, Multiplex PCR (mPCR), California Mastitis Test (CMT)

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 48 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0075

#### Muyong: an indigenous sustainable forest management system Enkiwe, Eu

This involves the conservation and utilization over a small area of forestland practiced in Ifugao and also known as "*pinucho*". Muyong consist of a small area of woodlot or microforest of a broad farming system of the Ifugaos for watershed and timber resources. Different species of trees are are often found in a muyong, such as white lauan, narra, molave, oak, or kala nt as and lately the smooth-leaf yakal. Briefly discussed are the management, conservat ion and utilization of muyong like underbrushing, thinning, enrichment plantin g, cutting of poisonous trees, shrubs and climbing vines, pruning of excess/overcrowding branches, selective cutting and debranching of trees before fell ing. On other hand, the types of muyong are presented and the law recognizing Ifugao farme rs as rightful owners over muyong.

Keywords: Agriculture, Muyong, Forest management system, Ifugao, Mt. Province, Pinucho

Canopy International, Volume No. 26 Issue No. 6, 2, 10 (Filipiniana Analytics) Fil(S) SD1 C165 26/6 2000

#### Two Neozygites species (Zygomycetes: Entomophthorales) infecting aphids and mealybugs on Leyte Island Villacarlos, Lina T.

The presence of two species of *Neozygites* (Zygomycetes: Entomophthorales) in the Philippines is documented. Epizootics due to *Neozygites fresenii* (Nowakowski) Romaudiere & Keller were observed on *Aphis craccivora* Koch populations on *Gliricidia sepium* (Jacq.) Steud. and string beans, *Vigna sesquipedalis* Fruw., and on *A. citricola* van der Goot infesting *Mikania cordata* (Burn f.) B.C. Rob., both in 1994, in ViSCA, Baybay, Leyte. Also in 1994, epizootics due to *N. fumosa* (Speare) Remaudiere & Keller were also observed on the mealybug, *Coccidohystrix insolita* (Green) infesting eggplant (*Solanum melongena* L.) in Inopacan and later on unidentified mealybugs on *Sida rhombifolia* L. Epizootics of both *N. fresenii* and *N. fumosa* resulted to drastic reduction in the aphid and mealybug populations. Enhancing the occurrence of these fungi may have potential in the biological control of these pests. (Author's abstract)

**Keywords:** Agriculture, Entomophthorales, Neozygites fresenii, Neozygites fumosa, Aphids, Mealybugs, Entomopathogenic fungi

The Philippine Entomologist, Volume No. 14 Issue No. 1, 31-36 (Filipiniana Analytics) Fil(S) QL461 P5 14/1 2000

0077

#### A new genus and species of aphalaridae (psylloidea, hemiptera) from Mount Makiling, Luzon Island, Philippines Navasero, Mario V., Calilung, Venus J.

A new paurocephaline genus, *Marpsylla* and its type-species, *M. Baltazarae*, n. sp. are described and illustrated. Additional information on host plants, habits and key to Philippine species of *Marpsylla* are provided. The male genitalia are described and illustrated for the first time for the other two member species, namely M. brevicephala, n. comb. and M. minuta, n. comb. (Author's abstract)

**Keywords:** Agriculture, Aphalaridae, Psylloidea, Marpsylla, M. baltazarae, M. brevicephala, M. minuta, Paurocephala

The Philippine Entomologist, Volume No. 15 Issue No. 2, 125-132 (Filipiniana Analytics) Fil(S) QL461 P5 15/2 2001

0078

#### A new species of dried banana leaf spider, *Neobrettus* wanless 1984 (Araneae: Salticidae) from the agricultural lowlands of Mt. Banahaw, Quezon Province, Philippines *Barrion, Alberto T.*

*Neobrettus nangalisagus*, a new species of small and squat pluridentate jumping spider from the agricultural lowlands of Mt. Banahaw, Luzon Island, Philippines is described and illustrated. The genus is a new Philippine record and the taxon *N. nangalisagus* represents the third species in the world. Biological notes on its behavior, prey

and preferred habitat are provided. The proposed common name for the new species is dried banana leaf spider. (Author's abstract)

**Keywords:** Agriculture, Salticidae, Neobrettus nangalisagus n. sp., Pluridentate, Dried banana leaf spider, Prey, Behavior

The Philippine Entomologist, Volume No. 15 Issue No. 1, 27-35 (Filipiniana Analytics) Fil(S) QL461 P5 15/1 2001

0079

### A new species of stick insect (Phasmatodea: Heteropterygidae: Obriminae: Obrimini) from Cebu Island, Philippines

Zompro, Oliver, Eusebio, Orlando L.

A new species of *Theramenes* Stål, 1875, *Theramenes mandirigma* Zompro & Eusebio sp. nov. (Phasmatodea: Heteropterygidae: Obriminae: Obrimini), is described and illustrated from the Philippine island of Cebu. It differs from the only other species in the genus, *T. olivaceus* (Weswood, 1859), by the number of tubercles on the tergum and the smaller size. (Author's abstract)

Keywords: Agriculture, Phasmatodea, Theramenes mandirigma n. sp., Obrimini, Philippines

The Philippine Entomologist, Volume No. 15 Issue No. 1, 23-26 (Filipiniana Analytics) Fil(S) QL461 P5 15/1 2001

0080

#### A new species of the genus *Bavia* simon, 1877 (Araneae: Salticidae) from the highlands of Sagada, Mountain Province, Luzon Island, Philippines *Barrion, Alberto T.*

*Bavia gabrieli*, a new species of pluridentate jumping spider from the highlands of Sagada, Mountain Province, Luzon Island, Philippines is described. It closely resembles *B. sexpunctata* (Doleschall, 1859) from Amboina, Molucca Islands, Indonesia in body size, general appearance and leg spination. *B. gabrieli*, however, has three promarginal teeth in both sexes; male pedipalp has a long posterior lobe of tegulum which extends to basal one-third of tibia, conductor and embolus are twice longer than in *B. sexpunctata*, retrolateral tibial apophysis (RTA) blunt and truncated anteriorly; female *B. gabrieli* unlike *B. sexpunctata* has 4123 leg formula, genopore opening broad and strongly laterad, midposterior epigynal margin strongly sclerotized and tongue-like, and rounded spermathecae slightly broad anteriorly. (Author's abstract)

Keywords: Agriculture, Salticidae, Bavia gabrieli n. sp., Thiodininae, Pluridentate jumping spider

The Philippine Entomologist, Volume No. 14 Issue No. 1, 53-60 (Filipiniana Analytics) Fil(S) QL461 P5 14/1 2000

#### Is nipa farming feasible Guerrero, III, Raf

Nipa is propagated using mature seeds that is directly planted in the field or grown in nurseries with a germination period of 13 days. When the seedlings are 0.20 meters high and with 2 or 3 leaves after 3 mos of planting, they are transplanted in mangrove areas at 2 meters apart for sap production and 1 meter for leaflet production. Nipa grows best in estuarine areas with acidic muddy soils rich in alluvial silt, clay and humus, hence, no artificial fertilization is required. A total of 5,000 plants per hectare can be utilized for sap production while 10,000 for leaflet production. Weeding must done at least 3 times a year. The Ecosystems Research and Development Bureau recommended that nipa be tapped for their sap 4 yrs after planting while leaflets can be harvested 6-7 yrs after planting. Furthermore, growing nipa does not need replanting after harvest and requires less maintenance than most crops. Nipa has a lifespan of as long as 50 yrs and fish, shrimp and mollusks can be grown with it.

Keywords: Agriculture, Nipa, Nypa friticans, Nipa farming

Agriculture magazine, Volume No. 16 Issue No. 2, 16-17 (Filipiniana Analytics) Fil(S) S19 A 83 16/2 2012

0082

#### **Optimization of batch recirculating dryer performance** *Martinez, Romualdo C., Maquila, Robelyn E., Guadalupe, Alvin P., Manalabe, Ru*

The study was conducted to optimize the performance of batch recirculating dryer for paddy, in terms of drying capacity and drying efficiency while maintaining grain quality. Field survey was carried out to establish current practices in batch recirculating dryer operation in Nueva Ecija. Baseline measurements of airflow rate and other relevant specifications were made as basis for simulation of batch recirculating dryer performance through laboratory drying experiments. The experiments covered drying temperature of 60 to 90°C, grain residence time of 1.5 to 4.5 min and superficial air velocity of 0.15 to 0.27 m/s. Commercial drying tests were subsequently performed to validate optimum dryer settings established from the laboratory experiments. Survey results on drying practices showed that although batch recirculating dryer manufacturers only recommend 60 °C maximum drying temperature, majority of dryer operators use 70 °C or even higher drying temperature to increase drying capacity, even though they are aware of the adverse effect on grain quality. Results of laboratory experiments showed that increased drying temperature improved moisture reduction rate, but reduced both drying efficiency and head rice yield. Paddy was dried up to 70 °C without significant reduction in head rice yield. Longer grain residence time improved both moisture reduction rate and drying efficiency, but decreased head rice yield. Greater superficial air velocity increased moisture reduction rate, but diminished drying efficiency and head rice yield. Using the dryer performance at 60 °C drying temperature, 3 min grain residence time and 0.21 m/s superficial air velocity as baseline reference, two dryer settings that considerably improved dryer performance were identified. The first was increased drying temperature to 70°C. This resulted to 23 percent increase in moisture reduction rate, but also 4 percent reduction in drying efficiency. The second was increased grain residence time to 4.5 min. This resulted to 7 percent improvement in both moisture reduction rate and drying efficiency. In general, the results of eight commercial drying trials validated the improvement in dryer performance using the above mentioned dryer settings. The project cooperator would adopt 70 °C drying temperature especially when there was huge volume of grain to be dried, but was reluctant to implement reduced unloading rate. (Author's abstract)

Keywords: Agriculture, Batch recirculating dryer, Drying efficiency, Drying capacity, Maintaining grain quality

PhilMech Journal: post harvest engineering, Volume No. 1 Issue No. 1, 62-81 (Filipiniana Analytics) Fil(S) S698 P45 1/1 2010

0083

#### Organic matter residue management for the improvement of soil quality in lowland rice systems Villegas-Pangga, Gina

Soil productivity, biological diversity and impacts on the surrounding environment of the agricultural systems provide a more complete description of a 'quality' soil resource as a dynamic living system. Soil quality is an assessment of how well soil performs all of its functions now, and how those functions are being preserved for future use. A long-term project was conducted on a low-fertility clayey soil (Aquandic Epiaqualf) at IRRI-U.P. Los Baños Experiment Station. The objectives of this soil research are to strategies to improve soil functions and identify soil characteristics as indicators of soil quality.

Large increases in rice yields have been demonstrated with the application of fertilizer, rice straws, and the use of multi-purpose tree species, such as Gliricidia sepium and Macaranga tanarius. A combination of low-cost technologies resulted in increases in yield, long-term restoration and subsequent maintenance of soil resource base. The applications of fertilizer and plant residues which decompose rapidly had an immediate impact on rice yields. In experiment, there earlier vears of the was impact no of the incorporation of organic materials. However, positive changes became evident in subsequent years. Rice yield respond reflects the beneficial effect of the organic materials on nutrient utilization efficiency which may also be related to improved soil fertility and microbial activity when residues were applied. The initial benefit of the application of G.sepium appeared to be related to its nutrient composition and decomposition rate. A change from high-input and chemically-intensive agriculture to a more sustainable form of agriculture is not only desirable, but also necessary. Management of organic materials that focus on improving soil health and conserving the remaining soil resources are realized. Careful management of residue quality and quantity, combined with judicious use of inorganic fertilizers, allows management of organic matter and nutrient dynamics to produce a 'quality' soil that should prove to be more sustainable. (Author's abstract)

Keywords: Agriculture, Decompisition rate, Plant residues, Soil organic matter, Fertilizers, Lowland rice

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 25 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0084

#### Organic rice farming in Northeastern Thailand: an assessment of farmers' practices Chouichom, Seksak, Yamao, Masahiro

Rice is a staple food for Thais and is the main economic crop for the Thai agricultural sector. Thailand is now essentially self-sufficient in rice, and emerging vital as а exporter of high-value agricultural produce. Since 2001, the Thai government has implemented sustainable agricultural policies for the expansion of organic rice farming with the aim of improving the rice industry. The objectives of this study therefore were to document farmers' adoption of organic jasmine rice farming, examine farmers' socio-economic data to identify factors promoting adoption, and analyze various constraints affecting adoption practices. The data were collected from 160 jasmine rice farmer households in Surin province during August- September 2008, through interviews and group discussion. Structured and semi-structured questionnaires were used in the survey. Results showed that most rice farmers had practiced organic rice farming and their switch was significantly and positively influenced by farm income, farmers' contact with extension workers, and information access. Limited water supply in farms posed а major obstacle for the further expansion of organic rice farming. This study recommends that training courses and farm demonstrations in organic rice production technology should be planned and implemented to further promote organic rice farming. (Authors' abstract)

Keywords: Agriculture, Farming practices, Organic rice farming, Rice farming

Philippine Scientist: a scholarly journal for natural and physical sciences and mathematics, Volume No. Issue No., 44-67 (Filipiniana Analytics) Fil(S) Q1 J95 v.49 2012

0085

#### The Paurocephala psylloptera-complex (Hemiptera: Psylloidea: Aphalaridae) in the Philippines with description of a new species Navasero, Mario V., Calilung, Venus J.

Two subspecies of *Paurocephala psylloptera* are elevated to distinct species, namely, *P. maculipennis* Uichanco, n. stat. and *P. setifera* Crawford, n. stat. Another species, *P. sanchezi* n. sp., is here described. A new host plant and new locality are recorded for *P. psylloptera* and *P. maculipennis*, respectively. (Author's abstract)

Keywords: Agriculture, Paurocephala, P. psylloptera, P. maculipennis, P. sanchezi n. sp., P. setifera, Hemiptera, Psylloidea, Aphalaridae

The Philippine Entomologist, Volume No. 15 Issue No. 1, 13-21 (Filipiniana Analytics) Fil(S) QL461 P5 15/1 2001

0086

#### Pestnet: an inexpensive diagnostics and pest management advisory tool for crop protection practitioners in the Philippines Cayabyab, Bonifacio F., Cuaterno, Wilma R., Sastrouno, Soetikno

An email network that provides the pest diagnostic is now in place. PestNet is an e-mail network that helps people in the Pacific and South East Asia obtain rapid advice and information on plant protection. It links the Pacific and South East Asian regions with plant protection specialists worldwide and is free to members.

The Philippines have used the services of the PestNet on various occasions such as the identification of a new invasive pest of corn, the management of the coconut leaf beetle, *Brontispa longissima* and others. We also provided identification services for some of the unknowns that were posted by subscribers.

The PestNet is a convenient, fast, and reliable system for the diagnostics and pest management advisory needs of crop protectionists in the Philippines. Most of the scientists who provide the above assistance are likewise willing to receive specimen for further validation. Hence an array of experiences and knowledge on various topics like quarantine, surveillance, biodiversity, invasive, species, events like workshops, etc. aside from diagnostics and pest management advisories are available. The PestNet is an excellent way to network on matters that pertain to plant health and crop protection. (Author's abstract)

Keywords: Agriculture, PestNet, Identification, Pest management advisory, Validation, Plant health, Crop protection, Philippines

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 33-34 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### 0087

#### Phacopteron gabrieli, a new psylloid (Hemiptera: Psylloidea: Phacopteronidae) from Mount Makiling, Luzon Island, Philippines Navasero, Mario V., Calilung, Venus J.

A new phacopteronid, *Phacopteron gabrieli* is described from Mount Makiling and is the first record of the occurrence of this genus in the Philippines. This species is only the second to be described under the genus which had been monotypic since 1894. (Author's abstract)

Keywords: Agriculture, Phacopteron, P. gabrieli, Phacopteronidae, Psylloidea

The Philippine Entomologist, Volume No. 14 Issue No. 1, 49-52 (Filipiniana Analytics) Fil(S) QL461 P5 14/1 2000

#### Phasmotaenia elongata, n. sp., a new stick insect (Phasmatodea: Phasmatidae) from the Philippine Islands Zompro, Oliver, Eusebio, Orlando L.

A new species of stick insect (Phasmatodea: Phasmatidae) from the Philippine Islands, *Phasmotaenia elongata*, n. sp., is described and illustrated. It differs from the only species of *Phasmotaenia* Navas, *P. sanchezi* (Bolivar) in terms of body and egg morphology. *P. elongata* is restricted to the Northern part of Luzon island. (Author's abstract)

Keywords: Agriculture, Phasmatodea, Phasmotaenia elongata n. sp., Philippines

The Philippine Entomologist, Volume No. 14 Issue No. 1, 61-64 (Filipiniana Analytics) Fil(S) QL461 P5 14/1 2000

#### The Philippine duck industry: issues and policy directions

#### Chang, Hui-Shung (Christie), Lambio, Angel L., Dagaas, Clarita T., De Castro, Nenita L., Malabayabas, Ma. Luz L.

The Philippine duck industry is dominated by smallholder egg production, which accounted for more than 75 percent of duck inventory.

At present, almost all the demand for duck eggs is met by domestic production while about two percent of duck meat consumption is imported.

As such, imports appear not to be a serious threat at present.

However, it is envisaged that as trade liberalisation and economic development continue, the Philippine duck industry, as well as other traditional industries, will face increasing competition from imported and new products.

Continuing survival, and growth, of the Philippine duck industry depends on its ability to better meet consumer demand for cheap and high quality products, which, in turn, depends on improving production and marketing efficiency.

The objectives of this paper are to provide an overview of the industry and to identify key issues and areas for policy intervention to improve competitiveness of the Philippine duck industry. (Author's abstract)

Keywords: Agriculture, Duck, Duck eggs, Duck meat

Animal Husbandry & Agricultural Journal, Volume No. 40 Issue No. 3, 8-9 (Filipiniana Analytics) Fil(S) SF1 A54 40/3 2006

### Some Philippine raphignathoidea (acari). IV. the genera *Ledermuelleriopsis* willmannn and *Zetzellia* oudemans (stigmaeidae) *Rimando, L.C., Corpuz-Raros, L.A.*

One new species of *Ledermuelleriopsis* and two new species of *Zetzellia* are described and illustrated. (Author's abstract)

Keywords: Agriculture, Philippine raphignathoidea, Stigmaeidae, Ledermuelleriopsis, Zetzellia

#### PNRI mutant variety: Cordyline 'Afable' Aurigue, Fernando B.

*Cordyline* 'Afable,' registered by the Philippine Nuclear Research Institute as NSIC 2009 Or-83, is an induced mutant developed from *Cordyline* 'Kiwi' by treating stem cuttings with acute gamma radiation from a Cobalt-60 source. The new mutant is identical to *Cordyline* 'Kiwi' in growth habit but differs in foliage color, and exhibits field resistance to *Phytophthora* sp., a fungus that causes leaf blight and rot in Ti plants. Results of this mutation breeding experiment showed that leaf color was altered by gamma irradiation and resistance to fungal diseases was improved. It also demonstrated how mutations that occur in nature may be generated artificially. Propagation of *Cordyline* 'Afable' is true-to-type by vegetative propagation methods, such as separation of suckers and offshoots, shoot tip cutting, and top cutting. Aside from landscaping material, terrarium or dish-garden plant, it is ideal as containerized plant for indoor and outdoor use. The leaves or shoots may be harvested as cut foliage for flower arrangements. (Author's abstract)

**Keywords:** Agriculture, Chlorophyll mutant, Cordyline, Gamma irradiation, Mutation induction, Mutant variety, Ornamental plant, Ti plant

Philippine Nuclear Journal, Volume No. Issue No., 1-8 (Filipiniana Analytics) Fil(S) QC173 P55 v.17 2012

#### Potential effects of commercial molluscicides used in controlling golden apple snails of the native snail Vivipara costata (Quoy & Gaimard) dela Cruz, M.S., Joshi, R. C., Martin, E. C.

The effects of commonly used molluscicides at different rates were determined against the pest golden apple snail (GAS), *Pomacea canaliculata* (Lamarck), and the non-destructive native snails (NS), *Vivipara costata* (Quoy and Gaimard). So far, all molluscicides approved by the Fertilizer and Pesticide Authority (FPA) for trade in the Philippines are effective in controlling GAS. Niclosamide 250EC is more deadly to NS than metaldehyde formulations. Niclosamide 250EC at recommended dosage (1 L/ha) caused a significant mortality of GAS populations (58.3%) one day after treatment (DT). However, it i most lethal to NS at 7 DT, while metaldehyde formulations caused very low mortality (0-6.3%). At half the recommended dosage, it killed 87.5 percent of GAS only at 7 DT. The adverse effects on NS of compounds, except niclosamide 250EC, were not immediately evident after application. Educational campaigns are therefore needed to make farmers aware of the adverse effects of molluscicides to NS. (Author's abstract)

**Keywords:** Agriculture, Golden apple snail, Pomacea canaliculata, Native snail, Vivipara costata, Molluscicides, Rice, IPM

## Predicting the effects of land use on runoff and sediment yield in selected sub-watersheds of the manupali river using the Arcswat model

#### Alibuyog, Nathaniel R., Ella, Victor B., Reyes, Manuel R., Srinivasan, Raghavan, Heatwole, Conrad, Dillaha, Theo

The quantitative prediction of environmental impacts of land use changes in watersheds could serve as basis for developing sound watershed management schemes, especially for Philippine watersheds with agroforestry systems. ArcSWAT, a river basin scale model developed to quantify the impact of land management practices on water, sediment, and agricultural chemical yields, was parameterized and calibrated in selected Manupali River sub-watersheds with an aggregate area of 200 ha to simulate the effects of land use on runoff volumes, sediment yield, and streamflows.

Calibration results showed that Arc SWAT can adequately predict peaks and temporal variation of run off volumes and sediment yields with Nash and Sutcliffe coefficient (NSE) ranging from 0.77 to 0.83 and 0.55 to 0.80, respectively. Simulation of land use change scenarios using the calibrated model showed that runoff volume and sediment yield increase by 3% to 14% and 200% to 273%, respectively, when 50% of the pasture area and grasslands are converted to agricultural lands. Consequently, this results in the decrease of base flow by 2.8% to 3.3%. with higher the value indicating а condition of the watershed without soil conservation intervention. More seriously, an increase of 15% to 32% in runoff volume occurs when the whole sub-watershed is converted to agricultural land. This accounts for 39% to 45% of the annual rainfall to be lost as surface runoff.

While simulation results are subject to further validation, this study has demonstrated that the Soil and Water Assessment Tool (SWAT) model can be a useful tool for modeling the impact of land use changes in Philippine watersheds. (Author's abstract)

Keywords: Agriculture, Land use change, Runoff, Sediment yield, SWAT modeling

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 36-37 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Productivity and soil erosion in various crop cover in the mountainous areas of Bondoc Peninsula, Philippines

Josue, Danilo S., Mendoza, Teodoro C.

The study was conducted in Batabat Sur, Buenavista, Bondoc Peninsula. Quezon, Philippines from October 1997 to September 1998. The highest soil erosion rate occurred in corn monocropping at 159 t ha<sup>-1</sup> yr<sup>-1</sup> valued at 256 USD. The net income per ha was 236 USD though the highest was not enough to offset the value of eroded soil. The soil erosion was minimal at 5.0 t ha<sup>-1</sup> yr<sup>-1</sup> in pure coconut stands valued at 23 USD in the same slope range of 15.1-35%. Due to huge quantity of eroded soil in corn monocrop, NPK loss was also the highest at 362, 12, and 200 kg ha<sup>-1</sup> yr<sup>-1</sup>, respectively. NPK loss in pure coconut was only 9.82, 0.12. and 2.14 kg ha<sup>-1</sup> yr<sup>-1</sup>, However, the net income was also the lowest at 152 USD but this income exceeded the value of eroded soil about 7x. Soil erosion was

reduced to about half (90 I ha<sup>-1</sup> yr<sup>-1</sup> relatively to pure corn) when corn was intercropped under coconut but soil erosion was still 12x higher compared with pure coconuts at 15.1-35% slope. Due to the absence of protective crop cover, soil erosion was highest at 183 t ha<sup>-1</sup> yr<sup>-1</sup> in the 15.1-35% slope in idle or fallow lands used as pasture areas. Since the productivity and net income under pure coconut was low (154 USD ha<sup>-1</sup> yr<sup>-1</sup>) and intercropping corn provided 190.5 USD ha<sup>-1</sup> additional income, more farmers were planting corn as an intercrop. Consequently, soil erosion also increased. (Author's abstract)

Keywords: Agriculture, Soil erosion, Crop cover, Productivity, Upland community development

MSU Research Journal, Volume No. 4 Issue No. 2, 1-11 (Filipiniana Analytics) Fil(S) Q179.9 M66 4/2 2002

0095

### Profitability of Coconut production: an analysis of farm size, rental, cost, inorganic fertilization, and copra price during a five-year cropping cycle period (technology notes) Canja, L.H., Magat, S.S.

To educate and convince the potential investors in increasing the farm yields and local coconut supply, the right and timely facts on coconut production and productivity should be available to users, hence the urgent need for this brief information and educational communication (IEC) guide-reference. Mainly, it deals with coconut farm rental (lease arrangement), at 10% yearly increase, at two selected farm sizes (5 and 10 ha) and two selected rental cost (PhP 5,000 and 10,000/ha/yr), projected each year for a 5-year cropping period or agri-business cycle of a coconut farm. Two given practical, tested and effective fertilizers (common salt and multi-nutrient) are considered, with research-generated projected yields, and 4 copra farm gate prices (PhP20 - 45 per kg) at 10% yearly increase used.

In this regard, as coconut farmers are known to be capital resource-limited, hence, capital rich private sectors should be explored and encouraged to participate in investing their available financial resources in the improvement of coconut farm productivity and production supply through the application of effective and efficient farm technologies as crop nutrition and fertilization management capable of quickly optimizing yields and maximizing farm profits. Results showed, regardless of farm size and farm rental cost, the use of multi-nutrient coconut-specific fertilizer (MNF) with sufficient and balanced 6 coconut crop nutrients (nitrogen, phosphorus, potassium, chloride, sulfur and boron) reached higher and consistent yields compared to the cheaper chloride rich fertilizer (common salt). MNF fertilizer strongly tends to increase yields (3-4 t/ha/yr), with higher net returns, Net Present Value (5 years, 18% interest) and Benefit-Cost ratio higher than 2.5. Moreover, at a 5-ha farm size, higher net returns (NR), net present value (NPV, 5years, 18% interest), benefit-cost ratio (BCR) are obtained at an annual rental cost of PhP 5,000/ha over the PhP10,000/ha. Also, coconut production cost is lower. While under a 10-ha farm size, higher NR, NPV and BCR are obtained at the annual farm rental cost of PhP5,000/ha over the PhP10,000/ha. Also, the production cost is much lower than the latter. (Author's abstract)

**Keywords:** Agriculture, Coconut farming, Coconut fertilization, Coconut productivity, Coconut-specific-multinutrient, Copra, Copra price, Farm profitability, Farm rental schemes, Sea-salt fertilizer

Philippine Journal of Coconut Studies, Volume No. Issue No., 1-8 (Filipiniana Analytics) Fil(S) SB401.C6 P45 v.38 2013

#### Propagation of machiku bamboo through air layering Bautista, Gene C., Soliban, Jr.,

Machiku (*Dendrocalamus latiflorus*) is one of the 10 bamboo species recommended for widespread planting and culture. Since this bamboo species is one of the difficult to propagate by vegetative means through the 'one node" cutting method, the authors tried to induce rooting in the machiku branches and nodes while the culms were still standing. As soon as the roots have developed, the rooted branches are separated from the culms and transferred to rearing pots just like the "one node" or "branch" cutting method. Vegetative propagation through air layering or marcotting showed that the best month for the machiku bamboo to produce new roots was during the most active. The detailed process of propagating machiku bamboo through air layering is presented.

Keywords: Agriculture, Bamboo, Air layering, Machiku, Dendrocalamus latiflorus

Agriculture magazine, Volume No. 16 Issue No. 2, 30-31 (Filipiniana Analytics) Fil(S) S19 A 83 16/2 2012

0097

#### Quantitative and qualitative assessment of corn postharvest losses Salvador, Amelita R., Malanon, Hernaiz G., Calica, Gigi B., Vereña, Roderic, Castillo, Priscilla B.

The project aimed to update baseline data on corn postharvest losses specifically in Isabela, Bukidnon and South Cotabato with the ultimate objective of providing the basis for formulating sound and tenable loss reduction programs. Postharvest practices were identified and losses were measured quantitatively and qualitatively.

Majority (85%) of the farmers in Isabela, Bukidnon and Koronadal, South Cotabato manually harvest, mechanically shell and sundry dry the grains before marketing to the local traders/assemblers, wholesalers or hog raisers. Corn grains are dried using concrete pavements (MPDP), barangay roads or highways. In Banga, South Cotabato, around 90% of the corn farmers harvest the corn immature and sell it as earcorn right after harvest. local Shelling and drying operations are done at the traders/assemblers. feedmillers wholesalers levels. or

Total postharvest losses were recorded at 7.15%, 7.35% and 5.98% in Isabela, Bukidnon and South Cotabato respectively. Drying loss comprised 63.23% of the total losses. Climatic condition, varietal characteristics and machine factors were associated with postharvest losses.

Corn samples from the three provinces, except for the dry season in Isabela, have moldy grains beyond the 0.10% level set by Bureau of Agriculture and Food Product Standards (BAFPS).

High incidence of aflatoxin contamination (above 20ppb) in corn was detected in Isabela at the on-farm level during the rainy season. Moreover, corn grains at the trader level were highly contaminated with aflatoxin in Isabela and Bukidnon. Non-detectable aflatoxin was recorded in corn samples from South Cotabato.

Continuous awareness campaign on how to lessen and/or prevent postharvest losses, and inclusion of postharvest loss control measures as component under the government corn program can reduce postharvest losses and increase domestic supply of corn. (Author's abstract)

Keywords: Agriculture, Postharvest technologies, Postharvest losses, Loss reduction, Loss assessment, Mechanical dryers

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 45-46 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

Quantitative resistance loci (QRL) against bacterial blight (*Xanthomonas oryza pv. oryzae*) and leaf blast (*Pyricularia orazae Sacc.*) and quantitative trait loci (QTL) for grain qualities in rice (*Oryza sativa L.*)

Rey, Jessica D., Mendioro, Merlyn S., Vera Cruz, Casiana M., Xu, Jianlong, Gao, Yongming, Li, Zhikang

A total of 174 BC<sub>2</sub> introgression lines (ILs) originally selected for drought tolerance and grain quality traits, derived from crosses IR64/Binam and Teqing/Binam were used to map quantitative resistance loci (QRL) against bacterial blight, Xanthomonas oryzae pv. oryzae (Xoo) and leafblast, Pyricularia oryzae. Artificial inoculation was done under screenhouse conditions using Xoo races 6 and 9 and P. Oryzae isolates M64-1-3-9-1 and P06-6. Polymorphic SSR (simple sequence repeats) markers (182) were used for genotypic analysis. Three ILs from IR64/Binam population exhibited complete resistance (CR) to race 6, which was associated with six markers. Genotypic data indicated that the presence of donor alleles at all 6 loci is required for resistance, suggesting a strong epistasis between or among alleles at 6 loci. Twenty-eight ILs from IR64/Binam population exhibited CR to race 9. In the Teqing/Binam population, partial resistance (PR) to race 6 was associated with four markers and 73 showed CR to race 9. One QRL for CR and two QRL for susceptibility to race 9 were identified. Two QRL from IR64 x Binam and one QRL from Teqing x Binam population were identified as new QRL against M64-1-3-9-1. Three QRL from IR64 x Binam and one QRL from Teqing x Binam population against P06-6 were identified. Quantitative trait loci (QTL) for grain quality traits (GQ) were mapped as well. Sixteen new QTL were associated with grain elongation. Aroma and gelatinization temperature were contributed by Binam, with 60 and 21 putative QTL identified, respectively. Six marker loci were associated with GQ traits and BB QRL for both race 6 and 9. More in depth exploration on the effect of all diseases to GQ traits can be done to identify which specific QRL and QTL are interacting. This can be achieved by backcrossing the selected ILs to the recurrent parent or ultimately by cloning the ORL. (Author's abstract)

**Keywords:** Agriculture, Quantitative trait loci, Quantitative resistance loci, Bacterial blight, Leaf blast, Grain quality

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 6-7 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0099

#### Quantitative trait loci (QTL) analysis for iron toxicity tolerance in rice (Oryza sativa L.) Elec, Venus H., Quimio, Celsa A., Mendoza, Rhulyx, Sajise, Andy G., Beebout, Sarah J., Gregorio, Glenn B., Singh, Rakesh Kumar

Iron toxicity is a major problem of the coastal areas in the tropics and also some specific regions like lowland areas of western Africa. As much as 60% of the lowland rice area in West and Central Africa are at risk with iron toxicity and could result to an average yield loss of 50%. In severe cases, it could contribute up to 90-100% yield reduction depending on the intensity of the toxicity and tolerance level of the rice cultivar. Understanding the

0098

genetic basis of iron toxicity tolerance in rice is a fundamental task for breeders and molecular biologists to develop new rice varieties with more iron toxicity tolerance characters. The study aims to investigate genetic factors controlling tolerance to  $Fe^{2+}$  toxicity through investigation of the iron toxicity tolerance mechanism and identification of markers linked to iron toxicity tolerance in rice. A set of 350 F<sub>2</sub> individuals derived from a cross between Suakoko 8 (tolerant) and Bao Thai (sensitive) comprised the mapping population. The population was screened and evaluated for iron toxicity tolerance in the Phytotron at IRRI using six descriptive traits. A total of 720 simple sequence repeat markers covering the whole genome were used for the parental survey. Ninety-three markers (15%) were found to be polymorphic between the 2 parents and were used to screen the  $F_2$  progenies. Twelve putative QTLs for iron toxicity tolerance were detected through single marker analysis and interval mapping The identified markers located in chromosomes 3, 4, 5, 8 and 10 explain a small percentage of the total phenotypic variation as exhibited by the low individual LOD scores (2.51-4.48) The identification of 12 QTLs could help provide greater understanding of the genetic basis contributing to iron toxicity. (**Author's abstract**)

Keywords: Agriculture, Rice, Iron toxicity, Mapping population, QTL, Markers

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 5-6 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0100

#### Region I adopts sweet sorghum as regional strategic commodity Virtucio, Car

Sweet sorghum has been identified by the Region I's Development Council as a strategic commodity due to its viability as bio-power source and high yields both for sweet stalk and grain. Mariano Marcos State University had been designated as Regional Research and Development Center for Biofuel to evaluate the performance of sweet sorghum as source of bioethanol.

Keywords: Agriculture, Sweet sorghum, Biofuels, Yield, Sorghum

The PCARRD Monitor, Volume No. 36 Issue No. 1, 6 (Filipiniana Analytics) Fil(S) S19 P86 36/1 2008

#### Research and development of the spiral pump for water-disadvantaged areas in the Philippines: part I. statistically aided design of prototypes at Los Banos Naegel, L.C.A., Real, J. G., Mazaredo, A.M.

For economic reasons, many Filipino farmers cannot avail themselves of Irrigation water even In areas where there are either existing Irrigation systems or streamflow that could be tapped, since their fields are situated above the water level. Among the non conventional means to harness the available water and which have potential for cost-effectiveness Is the stream-drlven spiral pump, hence this project. Since there Is until now only limited Information available about the design parameters for most efficient operations, prototypes of spiral pumps were Initially constructed, each with an outer diameter of 2.0 m and made out of flexible tube materials of different Inner diameters. Varying the speed of rotation of the pump, the water volume scooped Into the tube, the sum of coil

diameters, and the height of water delivery, resulted In different volumes of delivered water and different energy requirements. By setting the output of the pump In relation to the required energy efficiency data were obtained for different parameters. Through a multiple linear non-linear regression analysis, highly significant formulas were derived for performance predictions of the pump running under different

conditions. With the data obtained In this study, with Information on the kinetic energy of a given stream and the drag coefficient of the paddles of the pump, It Is now possible to design a spiral pump where all design factors can be well matched, allowing the most efficient kinetic energy utilization of a given stream flow for pumping purposes. (Author's abstract)

Keywords: Agriculture, Spiral pump, Irrigation systems, Cost-effectiveness

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 15 Issue No. 4, 7-16 (Filipiniana Analytics) Fil(S) T1 N21 15/4 1990

#### Research and development of the spiral pump for water-disadvantaged areas in the Philippines: part II. field tests under actual farm conditions in Abra Naegel, L.C.A., Real, J. G., Mazaredo, A.M.

To verify the results of extensive design trials, to identify the design of the spiral pump working with acceptable efficiency under actual conditions, and to determine the acceptance of the new technology by small-scale farmers, field tests with spiral pumps of different designs were carried out at Bangued, in the Province of Abra, Philippines. The performance data of the tested spiral pumps were found to agree very well with the results from the laboratory tests. During the four-month long field test, no major problems occurred. Regarding the acceptance and impact of the technology, the spiral pump has come to be considered by the farmers as a

#### Keywords: Agriculture, Spiral pump, Irrigation systems, Cost-effectlveness

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 15 Issue No. 4, 17-22 (Filipiniana Analytics) Fil(S) T1 N21 15/4 1990

0103

## Researchers find ways to improve productivity of kawayan tinik *Abello*,

Kawayan tinik dominates the 62 recorded species of bamboo in the Philippines. The bamboo species has spiny branches and clumps that grow to a maximum of 20 cm in diameter with internodes of up to 60 cm long and can be harvested 4 years after planting. It is the best economically important bamboo species for shoot production and can be used in furniture, handicraft, construction, food, biofuel and for environmental protection . A 5-year research conducted at the Mariano Marcos State University together with the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development and Australian Center for International Agricultural Research identified the optimal clump management practices to improve the productivity of previously unmanaged bamboo

plantations as well as natural stands. A total of 78 clumps included in the study were subjected to plantation management practices such as nitrogen fertilizer application, mulching with bamboo leaves and installation of drip irrigation system . Results showed that new shoots emerged after t he first rain, hence, the availability of water was very important. Silviculture treatments likewise improved the diameter and size of poles as well as thickness of culms. Fertilizer application and mulching without irrigation, however, did not improve production of shoots indicating that most shoots emerge at the onset of the rainy season. Furthermore, the study showed that harvesting of 3 year old and older poles was more advantageous since they were stronger and more suited for construction purposes. The potential harvest results of the different treatment combination are given.

Keywords: Agriculture, Kawayan tinik, Bamboo, Bambusa blumeana

Agriculture magazine, Volume No. 13 Issue No. 2, 52-53 (Filipiniana Analytics) Fil(S) S19 A83 13/2 2009

#### A review and revised checklist of the mites (acari) in B.P. Gabriel's "insects and mites injurious to Philippine crop plants" *Corpuz-Raros, L.A., Rimando, L.C.*

The mites in B.P. Gabriel's *Insects and Mites Injurious to Philippine Crop Plants* (1997, 2000) are reviewed. Doubtful species records are identified and errors in host records and cited references are corrected. A revised checklist is presented, including only mite species and host plants with specimen documentations in publications and museum collections. These amount to 39 mite species on 65 kinds of crop plants and cover only about half the presently known diversity of phytophagous mites from the Philippines. Nomenclatural comments are given for *Tetranychus telarius* Linnaeus, a suppressed name which has been applied to spider mites infesting a number of crops in the Philippines. The need for a taxonomic review of spider mites and their host plants is pointed out, especially *Tetranychus* and *Eutetranychus* species. (Author's abstract)

Keywords: Agriculture, Tetranychidae, Tenuipalpidae, Mites, Mite pests, Phytophagous mites, Checklist

The Philippine Entomologist, Volume No. 15 Issue No. 2, 163-179 (Filipiniana Analytics) Fil(S) QL461 P5 15/2 2001

0105

#### A review of the genus ultratenuipalpus mitrofanov (acari:tenuipalpidae) with descriptions of two new species from the Philippines *Rimando, L.C.*

The genus *Ultratenuipalpus* is redefined based on the eight known species which are likewise reviewed and redescribed. A revision of setal nomenclature is also proposed. Two new species from the Philippines, *Ultratenuipalpus baltazarae* and *U. lacorpuzrarosae*, are described, illustrated and a world key to all known species of *Ultratenuipalpus* is presented. (Author's abstract)

Keywords: Ultratenuipalpus, Tenuipalpidae, Citrus limon, Psidium guajava, Agriculture

The Philippine Entomologist, Volume No. 15 Issue No. 2, 101-113 (Filipiniana Analytics) Fil(S) QL461 P5 15/2 2001

### The rice problem in the Philippines: trends, constraints, and policy imperatives Balisacan, Arsenio M., Ravago, Majah-Leah V.

The comparatively poor performance of the rice sector in recent years is microcosm of the state of Philippine agriculture. Both domestic policies and institutions have constrained efficiency and raised the "cost of doing business" in agriculture, thereby blunting productivity growth and eroding the country's competitiveness in the global marketplace. Rice has become more expensive in the Philippines than in other developing East Asian countries, owing principally to the government's ill-advised self-sufficiency objective. Liberalizing rice trade enhances the welfare of the poor, especially landless workers and urban consumers, although the short-term cost to the rice sector in terms of reduced incomes and labor dIsplacement may be quite substantial. However, when this is combined with public investment in productivity enhancing support services (particularly R&D and irrigation), rice trade liberalization is a win-win proposition. (Author's abstract)

Keywords: Agriculture, Philippine agriculture, Productivity growth, Self-sufficiency, Rice, Trade liberalization

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 8 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

0107

#### Rubber disease enters Republic of the Philippines; found in Mindanao Hayudini, Alicia Ta

The leaf spot disease caused by the fungus *Corynespora cassiicola* were found in the rubber nurseries and plantations of the University of Southern Mindanao, specifically the RRIM 600 rubber variety which is known to yield high latex. The affected plants exhibited yellowing and occurrence of large lesions on the leaves. The disease usually occurs during the refoliation stage and infects new foliage flushes to killing of young branches if infection is severe.

Keywords: Agriculture, Rubber, Rubber leaf spot disease, Corynespora cassiicola

Agriculture magazine, Volume No. 13 Issue No. 12, 53 (Filipiniana Analytics) Fil(S) S19 A 83 13/12 2009 0106

#### Save much on seeding with the improved drum seeder Garcia-Layaoen,

The improved drum seeder developed by the Philippine Rice Research Institute is a lightweight and hand pulled machine for easy and efficient dispensing of rice seeds. The portable improved seeder is made of lightweight tubing and polyethylene plastic with a series of perforated plastic cylinders or drums supported by two wheels, furrowers and a soil cover. The seeder reduced seeding rate at 50-80% over broadcast seeding compared to the earlier drum seeders. Likewise, the seeding rate can be adjusted from 20 kg/ha to 40-60 kg/ha by placing a rubber band over the perforations in each of the cylinders. Field trials conducted in Palawan and Bohol showed the efficiency of the improved seeder by dispensing one or two seedlings per hill preventing seed wastage and savings on labor cost.

Keywords: Agriculture, Drum seeder, Rice seed, Philippine Rice Research Institute

Agriculture magazine, Volume No. 13 Issue No. 8, 42-43 (Filipiniana Analytics) Fil(S) S19 A 83 13/8 2009

#### Seed quality response to fungicide treatment of a line and F<sub>1</sub> hybrid seeds Brena, Susan R., Malabanan, Frisco M., Valiente, Bonnie M.

IR 58025 A (A line) and  $F_1$  hybrid seeds harvested during the wet season 1999 at the PhilRice-Central Experiment Station were dipped in various concentrations of benomyl to control fungal growth during a germination test. Hybrid seeds were germinated in petri dishes lined with moistened filter paper then stored in a germination room with Temperature range of 28-32°C.

Washing and ten-minute dipping in 5 and 3% benomyl solution resulted in high germination percentage in A lineand PSB Rc 27H ( $F_1$ ) mestizo hybrid. respectively. Germination of hybrid seeds at these fungicide concentrationswascharacterizedbyminimalfungalinfection.

Fungal growth in A line and PSB Rc 72H (F1) hybrid seeds washed with tap water was not controlled. A line seeds washed then dipped into 3% benomyl solution exhibited minimal occurrence of fungal growth. Prolonged dipping seeds for 10 minutes in 3% solution significantly controlled fungal growth. On the other hand, five-minute dipping in 3% solution proved very effective in controlling fungal growth in PSB RC 72H (F1) seed. (Author's abstract)

Keywords: Agriculture, Hybrid, Mestizo, A line, Benomyl, Germination, Fungal growth, Concentration, IR 58025A, PSB Rc 72H, F1

Transactions of the National Academy of Science and Technology, Volume No. Issue No., 303 (Filipiniana Analytics) Fil(S) Q149.P5 N25 v.22 2000

Seven new endemic species of *Hoya* R. Br. (Apocynaceae) from the Philippines Siar, Simeona V., Cajano, Mary Ann O., Kloppenburg, Robert Dale Hoyas, commonly called 'wax plant' or 'porcelain plants' can be found throughout the different islands of the Philippines. Our country is considered a center of diversity for hoyas due to the number of different species that can be found and is still waiting to be discovered. Most of the Philippine species are endemic. However, a number of them are indigenous and can also be found in neighboring places such as Borneo and Malaya. This is especially true for those species discovered in Palawan.

Seven new Philippine endemic species of *Hoya* R. Br. (Apocynacea) were collected and described. Three are from Quezon Province namely: *Hoya benvergarai* Kloppenburg et Siar from Dolores, Quezon, *H. lazaroi* Kloppenburg et Siar from Mt. Banahaw, and *H. soligamiana* Kloppenburg, Siar et Cajano from Atimonan. Four of the new endemic hoya species were from Laguna Province namely: *Hoya annjacanoae* Kloppenburg et Siar, *H. aurantiaca* Kloppenburg, Siar et Cajano, *H. lucardenasiana* Kloppenburg, Siar et Cajano and *H. landgrantensis* Kloppenburg, Siar et Cajano, all from Barangay Kapatalan, Siniloan, Laguna Province, These seven new taxa bring the number of described Philippine *Hoya* species to 68. (Author's abstract)

**Keywords:** Agriculture, Hoya, Hoya benvergarai Kloppenburg et Siar, H. anncajanoae Kloppenburg et Siar, H. lazaroi Kloppeburg et Siar, H. aurantiaca Kloppenburg, Siar et Cajano, H. lucardenasiana Kloppenburg, Siar et Cajano, H. landgrantensis Kloppenburg, Siar et Cajano, H. soligamiana Kloppenburg, Siar et Cajano

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 34 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0111

### State university developes dragon fruit products *Abello*,

The Cavite State University (CvSU) in Indang, Cavite with funding from the Philippine Council for Industry and Energy Research is into developing high-value processed products from dragon fruit such as dragon fruit puree, jelly, ready-to-drink juice, jam, cider vinegar and wine. An average of 40 kg dragon fruit flesh is being processed per production assembly on a weekly basis at the CvSU. The products were widely accepted by the consumers since its launching in August 2009. The availability of dragon fruit is a limitation of the project since the fruiting season in Indang is May to September after which production stops due to the low temperature in the area in October, so sourcing of other dragon fruit bearing areas like in Bulacan have to be done. Likewise, the quality of the dragon fruit products still need improvement including packaging to enhance marketability.

Keywords: Agriculture, Dragon fruit, Hylocereus undatus, H. polyrhizus

Agriculture magazine, Volume No. 13 Issue No. 12, 52-53 (Filipiniana Analytics) Fil(S) S19 A 83 13/12 2009

0112

### Status, prospects, and strategic options of buntal fiber industry in Marinduque *Capiña*, *Michael V., Llaguno, Ma. Tessa A., Capiña, Verna Liza L., Arrienda, II, Faustino Q.*

The popularity of *buntal*-based handloom products has raised the demand for the fiber. In Marinduque, available supply cannot meet the demand for the fiber, thus limiting the expansion of production by local and export markets.

Thus this study	was conducted t	o present information	on on the status	s of the <i>buntal</i>	industry as well	as to identify
investment	and	entry	points	for	the	industry.

The project study adopted Model Two of the strategic planning model of McNamara, with some modifications. It began by gathering information on the major sources of buri in the province and determining the profile of the *buntal* producers, followed by analysis of the income generated from *buri* extraction. Information on the current marketing channel system for the *buntal* produced in Marinduque was also established, followed by SWOT analysis.

Data were gathered through a survey of key informants of the industry in six towns and 60.55% of the barangays of the province. Ocular visits to the areas were done. Secondary data were also used to complete information regarding the industry. Estimates showed that *buri* is planted in 326.32 hectares in Marinduque. There are 44 fiber producers in four towns of the province, and the average monthly income of extractors of *buntal* is PhP 5,420.10.

It was concluded that with the abundance of raw materials and of skills in extracting fiber and in loom weaving, coupled with intensive product innovation and new product development, the *buntal* industry in Marinduque promises an opportunity for employment and augmentation of income to farmers, housewives, out-of school youths, and even working students. (Author's abstract)

Keywords: Agriculture, Buntal fiber, Buri extraction, SWOT analysis

Philippine Journal on Innovation & Entrepreneurship, Volume No. 1 Issue No. 1, 1-14 (Filipiniana Analytics) Fil(S) HB615 P45 1/1 2013

0113

#### Survey, identification and life history of Anthurium thrips Mituda-Sabado, Emma C., Calilung, Venus J.

Two thrips species, *Chaetanapphothrips orchidii* (Moulton) and *Trichromothrips* sp., infest anthurium grown in several areas in the Philippines. The life histories of these two species were studied. For *C. orchidii*, the average life cycle (egg to adult) lasts for 25.84 days. The incubation period is 9.42 days. The first and second larval instars, prepupal and pupal stages are 3.37, 6.34, 1.74 and 4.92 days, respectively.

On the other hand, *Trichromothrips* sp. took 18.06 days to complete its life cycle, and 8.64 days for its eggs to hatch (incubation). The first and second larval instars, prepupal and pupal stages last for 2.34, 3.90, 1.04 and 2.13 days, respectively.

Adults of *C. orchidii* survived for 23.11 days; those of *Trichromothrips* sp. for 11.00 days. Females of each species laid 22.40 and 17.20 eggs respectively. (Author's abstract)

Keywords: Agriculture, Anthurium thrips, Chaetanaphothrips orchidii, Trichromothrips sp.

The Philippine Entomologist, Volume No. 14 Issue No. 2, 121-129 (Filipiniana Analytics) Fil(S) QL461 P5 14/2 2000

#### Survey of alternate host plants of the Asian corn borer *Ostrinia furnacalis* (Guenee): maramais Trypsacum laxum, in Pangasinan

Caasi-lit, Merdelyn T., Sapin, Gelyn D., Quimio, Gorgonio M., Latiza, Suzette A., Gruezo, William Sm., Cascolan, Honorio L., Concepcion, Danah Jean, Pascua, Joel, Sanchez, Geoffrey P.

Bt corn planting in the different regions of the country is increasing in area as it is becoming popular as an effective control against the Asian corn borer (ACB), and aside from being remarkably profitable for farmers in Central Luzon. Records of the Bureau of Plant Industry have shown that many farmers are already planting corn after rice and even rice farmers are shifting to corn farming in the last two years especially in Pangasinan. However, should be reminded that Bt corn planting is farmers not only looking at profits but also following the IRM requirement built-in for this technology. By disregarding this crucial requirement, it is possible that ACB resistance will become a problem in the future.

The presence of weeds and non-crops is very important in an area because they play a crucial role in an IRM program for Bt corn. These are the naturally growing weed species or cultivated crops within and around the cornfield and they serve as alternate host plants of ACB. When these weeds or non-crops are abundant, they will serve as natural refuge for the Asian corn borer. To prevent the development of resistance, the importance of refuge (as a source of susceptible population that will dilute resistant borer developing from Bt corn) is vital. Survey of the alternate host plants of the ACB is an on-going study. During our project survey in Pangasinan, we found that maramais, *Trypsacum laxum*, is abundant in Tayug and Sta. Maria. This plant is also. found in other provinces. In the survey, it was observed that maramais is an alternate host of ACB. Larvae and pupae were dissected from the plants and adults were found abundant in areas where they were growing. This study aims to further evaluate the potential of maramais as an alternate host of ACB in greenhouse and laboratory conditions and determine its agronomic traits when planted in Los Baños conditions. (Author's abstract)

Keywords: Agriculture, Maramais, Trypsacum laxum, Bt corn, IRM, Alternate host plant, Asian corn borer, Ostrinia furnacalis

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 28-29 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### 0115

#### A survey of the rhopalocera (lepidoptera) of Mt. Makiling, Laguna, Philippines *Cayabyab, Bonifacio F.*

A survey of the butterflies 9Rhopalocera, Lepidoptera) of Mount Makiling, University of the Philippines Los Baños, was conducted from March 14, 1990 to April 3, 1992. The modified Pollard's transect technique was utilized. The 26-month survey yielded 145 species and subspecies of Rhopalocera comprising 74 genera in 8 families of the superfamiliy Papilionoidea and 16 genera from the family Hesperiidae of the superfamily Hesperioidea. Fourteen species and subspecies are new records for Luzon. These are all given as a taxonomic checklist herein provided (Author's abstract)

Keywords: Agriculture, Rhopalocera, Lepidoptera, Mt. Makiling, Laguna, Philippines

# Survival of boar spermatozoa intended for *In vitro* fertilization (IVF) following different speed, duration and frequency of sperm washing

Capitan, S.S., Machacon, E.L.

A 3 x 2 x 2 factorial experiment in completely randomized design (CRD) was conducted to determine the effects of various washing treatments on the survival of boar sperms intended for IVF. Fresh boar spermatozoa survived various speeds (2000, 1500, or 1000 rpm), duration (10 or 5 min) and frequency (once or twice) of washing with modified Bracket and Oliphant (BO) solution. There are no interaction effects (P> .05) among factors and the main effects are likewise not significant (P > .05). Average initial sperm motility was 78.33% whereas post treatment motility varied from 66.67 to 75.00% at 0 hr, 58.33 to 71.67% at 1hr; and 53.33 to 70.00% at 2 hr. Mean viability index ranged from 62.67 to 76.00. Indication of incomplete removal of the seminal plasma was evident in treatments with single washing. (Author's abstract)

Keywords: Agriculture, In vitro, Boar sperm, Braket solution, Oliphant solution

NRCP Research Journal, Volume No. 3 Issue No. 2, 183-190 (Filipiniana Analytics) Fil(S) Q179.9 N323 3/2 1993

0117

#### Sweet sorghum jaggery as alternative media for the production of commercial yeast *Franco, Prima Fe R., Gaoat, Cecile A., Franco, Samuel S., Layaoen, Heraldo L.*

Yeast plays a vital role in a number of industrial products especially in the production of wine and bakery products. Its production, however, entails a sizeable amount due to the expensive culture media used. The need to look for alternative, reasonably priced culture media is crucial to lessen the production cost.

Sweet sorghum produces juice of high sugar content, which can be extracted through milling. The juice then is subjected to high temperature for two or more hours to produce jaggery, a substance that can be a good substitute for table sugar.

This study used sweet sorghum jaggery as an alternative culture media for yeast production. Several percent jaggery were used in the culture studies. Results show that 15% jaggery is the optimum concentration for the highest percent production and recovery. Sweet sorghum jaggery contains the necessary nutrient requirements needed for the growth and development of yeast. Sweet sorghum jaggery can be a very affordable media for commercial production of yeast. (Author's abstract)

Keywords: Agriculture, Sweet sorghum, Jaggery, Yeast, Culture media

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 51 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### A taxonomic list of butterflies (lepidoptera:papilionoidea and hesperioidea) from Mount Banahao de Lucban, Quezon Province, Philippines *Lit, Jr., Ireneo L.*

A survey of the butterflies and skippers (Lepidoptera: Rhopalocera) of Mount Banahao de Lucban was conducted from July 1997 to December 2000. A total of 77 species under 56 genera (including one genus with two subgenera) were identified. These are distributed in 7 families, namely: Hesperioidea (1): Hesperiidae; Papilionoidea (6): papilionidae, Satyridae (including Amathusiinae), Nymphalidae, Danaidae, Pieridae and Lycaenidae. The best represented families are Pieridae and Nymphalidae with 14 species each. The common birdwing, *Troides rhadamantus* Lucas, which is included in Appendix II of the CITES list can still be found in the mountain particularly around the Samil area but was sighted only twice throughout the entire study period. Notes are also given for *Caltoris* sp., *Jamides cleodus cleodus* C.&R. Felder, *Nacaduba beroe* (C. & R. Felder), *Parnara guttata* (Bremer & Grey), *Potanthus* sp., *Rapala* sp. and *Spalgis* epius (Westwood). (Author's abstract)

Keywords: Agriculture, Butterflies, Rhopalocera, Troides rhadamantus, Mount Banahao de Lucban

The Philippine Entomologist, Volume No. 15 Issue No. 2, 151-161 (Filipiniana Analytics) Fil(S) QL461 P5 15/2 2001

0119

#### Technologies for profitable tobacco production *Tacadena*, *Manc*

These include the topped tobacco, where the flower of tobacco plant is cut, leaving only 12-14 leaves per plant. This technique draw initial resistance from the farmers only after they saw that 15 ha tobacco demonstration farm in generated higher income and good quality tobacco. The other technology adopted by the farmers is the early planting scheme which involves sowing the tobacco seeds by October 1 and replanting the seedlings by November 16, the latest would be November 30. This method is being encouraged as the soil is still moist after rice harvest, so that by middle of March, farmers would then be harvesting their tobacco leaves for curing. It has been observed that adopting this scheme produced better quality tobacco leaves.

Keywords: Agriculture, Tobacco, National Tobacco Administration

Agriculture magazine, Volume No. 13 Issue No. 12, 46 (Filipiniana Analytics) Fil(S) S19 A 83 13/12 2009

0120

# Technology transfer of *Cotesia*-based IPM for diamondback moth on lowland elevation crucifers in Luzon

Morallo-Rejesus, B., Inocencio, E. L., Malabanan-Manipol, J., Eusebio, J. E., Barroga, S. F.

Components of integrated pest management (IPM) technology developed for diamondback moth (DBM) *Plutella xylostella* (Linn.), in the lowland include the release of larval parasitoid, *Cotesia plutellae* (Kurdj.) supplemented with selective insecticide based on economic threshold level. The technology was transferred to farmers through the

training of trainors and farmers followed by farmer-participated demonstration farms (FPDF). The training was conducted in cooperation with local government units (LGU) state colleges and universities (SCU) and farmer associations.

A total of 1,154 farmers and 176 trainors from 31 municipalities of 9 provinces of Batangas, Camarines Sur, Cavite, Ilocos Sur, Ilocos Norte, Laguna, Nueva Ecija, Rizal and Quezon were trained and 49 FDPF were setup in 7 provinces.

High *C. plutellae* parasitism and cocoons and lower DBM population were noted in IPM than farmers control practices (FCP) fields. The farmer adoption of IPM technology resulted in the increase of net income ranging from US \$ 2,781 to 10,984/ha, 5-78 % higher than FCP due to lower production cost and higher yield. The production cost per hectare ranged from US \$1,104 to 3,902, 2 to 45 % lower than FCP. Insecticide application was reduced to 1-4 times in Quezon and 3-9 in Ilocos Sur and Norte from 15-36 times before the piloting of the technology. The increase in net income varied with the location, season, production cost and price of cabbage. (Author's abstract)

Keywords: Agriculture, Cotesia plutellae, Plutella xylostella, IPM, Parasitoids, Crucifers

The Philippine Entomologist, Volume No. 14 Issue No. 1, 73-87 (Filipiniana Analytics) Fil(S) QL461 P5 14/1 2000

0121

#### Tissue cultured avocado (Persea americana MILLER): a journey from laboratory to field Avenido, Renato A., Pateña, Lilian F., Carandang, Jennelyn M., Dimaculangan, Julita G., Siar, Simeona V., Barba, Ramon C.

Avocado (*Persea americana* Miller) ranks fifth in terms of world production of tropical fruits next to banana, mango, pineapple and papaya (Faylon *et al.* 2006). Worldwide attention is now focused on genetically improving the avocado by plant biotechnological techniques particularly *in vitro* mutation and selection and genetic engineering.

Hundreds of potential mutant and variant avocado lines from 'Semil, 'Mainit' and other seedling trees were produced from somatic embryos (SE) and mature zygotic embryos following tissue culture and gamma irradiation at the Institute of Plant Breeding, College of Agriculture, UPLB (Avenido *et al.* 2005). However, subsequent seedling establishment in the greenhouse has been delayed by the absence of roots and slow shoot growth among the SE-derived regenerants. Micro-grafting improved shoot growth but was tedious. This study was conducted to develop an improved system of rooting, hardening and potting out to maximize survival and greenhouse establishment of avocado

An alternative technique was developed by rooting *in vitro* regenerated shoots. Highest rooting percentage (50%) was in Barba and Pateña's medium, then Murashige and Skoog's medium (25%) and last, the Woody Plant medium (15%). Rooting was doubled from 38% to 62% and was induced earlier (i.e., 17 days) when more vigorous shoot regenerants were used. When rooted plantlets were transplanted, a 100% survival was obtained using a modified hydroponics system in a lighted (50  $\mu$ E m<sup>-2</sup> s<sup>-1</sup>) airconditioned growth room. Moreover, average survival rates of 83% and 92% were obtained among the untreated and IBA-treated regenerants, respectively. With the successful rooting and transplant of regenerants to soil, a complete micropropagation protocol for avocado was established.

A total of seventeen (17) avocado regenerants have been successfully potted out and established under screen house conditions. Of these tissue culture-derived avocado plants, 6 were produced through somatic embryogenesis from cv. 'SemiI' and 'Mainit' strain while 11 were derived via shoot organogenesis from 'Mainit', 'Semil', 'San Felix'

and 'Calauan' avocado. Moreover, 5 of these plants were produced from gamma-irradiated somatic embryos and shoot cultures (5 and 20 Gy) while the rest were derived from non-irradiated cultures. These avocado lines whose average heights range from 7.0 to 23 .5 (ave.=14.2 cm) are now ready for field planting and subsequent evaluation for horticultural characters including mutant genetic screening. (Author's abstract)

Keywords: Agriculture, Avocado, Ex vitro establishment, Fruit crop improvement, Micropropagation, Mutant induction, Somatic embryogenesis, Tissue culture

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 17-18 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0122

## Transgenic rice plants overexpressing host transcription factors Rf2A and Rf2B are tolerant to tungro disease

#### Alfonso, Antonio A., Duque, Ulysses G., Babb, Gina M., Miranda, Ronalyn T., Duque, Johna C., dela Cruz, Arlen A., Tiongco, Emmanuel R., Rivera, Tolentino, Dai, Shunhong, Beachy, Roger N.

Rice tungro disease (RTD) causes tremendous losses in the Philippines and other rice growing countries. Recent molecular studies have revealed interactions between specific regions of the rice tungro bacilliform virus (RTBV) promoter and host proteins resulting in the development of disease symptoms. One plausible explanation for this observation is that the endogenous transcription factors, called RF2a and RF2b, become sequestered by the viruses during infection and their limiting status disrupts plant development. To test this hypothesis, four Taipei 309-derived transgenic rice lines over-expressing RF2a or RF2b together with wild type Taipei 309, resistant check Matatag 6 and susceptible check TN1 were infected with viruliferous green leafhopper 25 days after sowing. Symptom development and ELISA indices for the two viruses were monitored daily until the eighth day and subsequently at 5day intervals up to 55 days after inoculation (DAI). Matatag 6 maintained a steady almost undetectable RTBV titer up to 55 DAI. For all the other entries, a generally increasing trend in the RTBV titer that peaked at 30-45 DAI was observed. At 55 DAI, RTBV titers were comparable to the 10 DAI levels. For RTSV, titers were also barely detectable in Matatag 6 but there was a slow upward trend for all the other entries. In terms of disease incidence, both TN1 and wild type Taipei 309 exhibited severe symptoms. The transgenic lines exhibited less severe symptoms and at certain points some lines were comparable to Matatag 6. Most of the transgenic plants recovered from tungro damage at 30 DAI. Among the four transgenic lines, RbMT6 had the highest number of healthy plants at 34.6% as opposed to 26.1 % in Matatag 6, the resistant check. The improved resistance of transgenic lines suggests that overexpressing RF2a and RF2b an transcription factors in the plant may reduce the symptoms associated with RTD. (Author's abstract)

Keywords: Agriculture, Rice tungro disease, ELISA, Transcription factors, Transgenic rice, Gene overexpression

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 12-13 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0123

### Utilization of acacia mangium for cement-bonded board manufacture *Mallari, Jr., Vicente C.*

The optimum manufacturing condition of producing cement-bonded board using Acacia mangium species was studied through board manufacture. Experimental boards were made with varying experimental variables. These were board density (500; 650; 800 kg/m<sup>3</sup>), type of accelerator (calcium chloride, aluminum sulfate, Houston 466), different soaking time (12, 24, 48 hours), and cement:wood ratio (40:60; 50:50; 60:40). The boards were evaluated modulus terms of of rupture (MOR), modulus of in nail-head elasticity (MOE). internal bond strength (IB), pull through (NHPT), thickness swelling (TS), and water absorption (WA).

Results showed that at the highest board density, boards exhibited the highest mechanical properties and greatest in dimensional stabilities. Internal bond strength showed increasing pattern perpendicular to the board density, however, results were still low. Nail head pull through test of the boards showed the same pattern and a high more than 120 kilos was obtained at the highest board density. Thickness swelling of boards showed a decreasing pattern soaking time was increased to 48 hours. of the as cement-bonded board produced using А good quality can be acacia mangium as the wood material. (Author's abstract)

**Keywords:** Agriculture, Acacia mangium, Calcium chloride, Aluminum sulfate, Modulus of rupture (MOR), Modulus of elasticity (MOE), Internal bond strength (IB), Nail-head pull through (NHPT), Thickness swelling (TS), Water absorption (WA)

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 24 Issue No. 1, 1-21 (Filipiniana Analytics) Fil(S) T1 N21 24/1 1999

0124

### The utilization of azolla in the Philippines: biological problems and solutions *Payawal, Pacifico C.*

The nationwide utilization of Azolla as a green manure for irrigated lowland rice fields was launched in 1982. Sixty eight provincial nurseries and 3000 community propagation ponds were established to service a target area of 300,000 ha. By 1988, only about 30 percent of the target area is using Azolla as a green manure and as feed supplement for livestock.

Although the field data incontrovertibly indicate that Azolla provides consequential benefits to rice farmers, its adaptation has been limited due to biological constraints. The technical assistance grant from the Asian Development Bank financed the establishment of the Azolla Varietal Improvement Laboratory at the Institute of Biological Sciences, University of the Philippines - Los Baños, in cooperation with the Bureau of Soil and Water Management, The South East Asian Regional Center for Graduate Study and Research in Agriculture, and the National Azolla Action Program. Hybridization work is currently undertaken to develop genetically superior hybrid lines. (Author's abstract)

Keywords: Agriculture, Azolla, Feed supplement, Livestock, Green manure

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 15 Issue No. 4, 49-66 (Filipiniana Analytics) Fil(S) T1 N21 15/4 1990

#### Utilizing balete for riverbank protection and watershed rehabilitation Baconguis, Santiago, R., Canete-Ranes, L

The balete or *Ficus* species belongs to the family Moraceae and they are found along the streams and fo rests at low and medium altitudes and up to 1,500 m above sea level in the Philippines. Since these trees reduces soil erosion, provide shelter and habitat for wildlife and mitigates desertification, it is has been considered to be used in stabilizing riverbanks and rehabilitating watersheds. Balete can be propagated by seeds or stem cuttings in moist and well-drained areas.

Keywords: Agriculture, Balete tree, Watershed protection, Riverbank protection, Ficus

Canopy International, Volume No. 26 Issue No. 6, 3, 11 (Filipiniana Analytics) Fil(S) SD1 C165 26/6 2000

#### Water management for improved post-rice production of upland crops in irrigated paddies *Maglinao, Am*

The production of upland crops following wetland rice has been practiced and found profitable by some farmers In the Philippines. It offers comparable or even higher income than rice, especially if supplemental irrigation can be provided.

While supplemental irrigation can improve the production of upland crops in irrigated paddles, irrigation management becomes a major concern. It does not merely consider the water requirement of the crops, but more Importantly, the capability of the irrigation facilities and the flexibility of the irrigation personnel and the farmers to shift from rice to non-rice crop irrigation, vice versa.

In most irrigation systems, irrigation personnel plan and implement their operation scheme based on the requirement of rice. To accommodate non-rice crops, major adjustments are made by the farmers themselves. They commonly construct temporary on-farm facilities like internal farm ditches within the paddy configuration and irrigate their crops by flooding (Author's abstract)

Keywords: Agriculture, Upland crops, Rice, Irrigation systems

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 15 Issue No. 4, 23-36 (Filipiniana Analytics) Fil(S) T1 N21 15/4 1990

#### 0127

#### Wild genetic useful mushroom resources of Central Luzon, as sources of nutriceuticals Reyes, Renato G., Kalaw, Sofronio P., Santos, Jordan, Antimano, Veronica, Abella, Evaristo A.

With our intention of harnessing the economic potential of wild useful mushroom resources in Central Luzon as sources of nutriceuticals, wild useful mushrooms were rescued and pure cultures were obtained. The rescued

mycelia of *Ganoderma lucidum* and *Auricularia polytricha* were deposited at the Mushroom Gene Bank of the Center for Tropical Mushroom Research. Their mycelial growth performances and their antibacterial properties were evaluated. Tissue culture technique was adopted in rescuing the mycelia of the above mentioned mushrooms. The rescued mycelia of each strain were evaluated and compared for their ability to grow efficiently on indigenous culture media. Also, their ability to inhibit the growth of both gram positive and negative bacteria was tested using their immobilized mycelial discs against *Escherichia coli* and *Staphylococcus aureus*. Eight strains each of *G. lucidum* and *A. polytricha* were evaluated. All the evaluated wild strains of useful mushrooms exhibited antibacterial activity with varying degrees of mycelial growth performances. Significant findings gathered in this investigation regarding their ability to inhibit the growth of bacteria proved that these strains are novel sources of nutriceuticals. (Author's abstract)

**Keywords:** Agriculture, Auricularia polytricha, Ganoderma lucidum, Mushroom nutriceuticals, Useful mushrooms, Wild mushrooms

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 46 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### High yielding sweet potato variety for Mindanao Belen, Ma. Ade

Field trials of 16 varieties were conducted to evaluate adaptability and yield performance at the DA-Northern Mindanao Integrated Agricultural Research Center in Dalwangan, Malaybalay City. Results showed that of the 16 varieties, Jk-02-20-4 consistently produced higher yield compared to the control variety, NSIC/PSB Sp 30 or JK-027. During the wet season, JK-02-20-4 produced 31.1 t/ha and produced the heaviest roots at 406.3 g/plant and 34% dry matter content (DMC). Likewise, it yielded 20.95 t/ha and 40% DMC during the dry season. The general acceptability rating of the JK-02-20-4 variety was 7.0 or "moderately liked" and produced the highest net return, hence, it was recommended to the National Seed Industry Council for nationwide commercialization.

Keywords: Agriculture, Sweet potato, Varieties, Yield

The PCARRD Monitor, Volume No. 36 Issue No. 1, 7, 14 (Filipiniana Analytics) Fil(S) S19 P86 36/1 2008

#### BIOLOGY

0129

#### Abundance, composition and distribution of Phytoplankton in Calamianes, Palawan Asis, Jules Jason C., Campos, Wilfredo L., Nabuab, Fenelyn M.

Phytoplankton in Coron Bay of the Calamianes Islands, Palawan were investigated from 27-29 May 2004. Samples were collected from 33 stations by filtering five 10 L buckets of surface water through a net with a 20mm mesh bag. The phytoplankton consisted of four major groups. Diatoms, showed the highest mean density of 1432.9 indivL<sup>-1</sup>. Silicoflagellates comprised the next most abundant group with a mean density of 132.3 indivL<sup>-1</sup>.

of indivL-<sup>1</sup>. with 94.8 while Dinoflagellates followed а mean density the cyanobacteria (blue-green algae) had a mean density of 19.4 indivL<sup>1</sup>. The top three diatoms were *Chaetoceros*, Bacteriastrum and Coscinodiscus. The genus Peridinium was the most abundant dinoflagellate, while TIntinnopsis dominated the silicoflagellates. Among the cyanophytes, Trichodesmium showed the highest density. High phytoplankton concentrations were observed in the vicinity of a pearl farm and in areas adjacent to mangrove forests. Overall abundance and diversity in the study area are higher than in other similarly reef-dominated areas in the country. This may be attributed to factors on both large and local scales. (Author's abstract)

Keywords: Biology, Phytoplankton, Diatoms, Chaetoceros, Bacteriastrum, Coscinodiscus, Peridinium, TIntinnopsis, Trichodesmium

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 18 Issue No. 2, 1-9 (Filipiniana Analytics) Fil(S) Q1.A3 S4 18/2 2006

#### Agricultural biotechnology trends and challenges Rasco, Jr., Eufemio T.

The main objective of this paper is to assess the leading edges of today's know ledge in agricultural biotechnology at the global scale, and offer some recommendations on the possible niches of the Philippines. Until recently, biotechnology is neatly classified as agricultural (including forestry and aquaculture), health, industrial and environmental. Presently, however, a great revolution is going on. Agricultural biotechnology is invading the other fields of biotechnology! We can call this the third agricultural revolution. The first revolution started the process we now call civilization 10000 years ago; the second (the Green Revolution) saved civilization from hunger about 40 years ago. The third hopes to save us from the problems created by the first and second revolutions and provide the material needs of future generations in а sustainable manner.

The scope of agriculture is now being extended from provision of basic needs, namely, food, fiber and clothing to include needs of modern civilization such as energy, materials, drugs, and industrial products such as enzymes. The definition of agricultural crops is being extended to include not only higher plants, but all photosynthesizing organisms. Techniques traditionally used for industrial scale culture of bacteria and fungi are being applied for single cell, tissue and organ cultures of higher plants and other photosynthesizing organisms. Thus, we are looking forward to a new generation of biofactories and production systems using photosynthesis as the main engine. These biofactories will produce traditional and non-traditional products cheaper, faster, safer and better. It is an exciting challenges future with а lot of promises but many and unknown perils, too.

The niche for the Philippines is dictated by the reality that its land area, the traditional basis of agriculture is limited. In addition, its climate is generally less favorable for traditional agriculture than many other environments. On the other hand, the Philippines has a huge surplus of unemployed manpower, sunshine and water. Review of recent literature suggests the following leading edges suitable for the Philippines for scientific and technological development in the field of conventional and modem agricultural biotechnology: I) new agricultural crops that are less susceptible to the vagaries of local climate and limitations of arable land, 2) new approaches for recombinant DNA technology, specifically plastid engineering; and 3) bioreactors and less sophisticated production systems using higher plant cells and organ cultures, and other photosynthesizing organisms such as mosses and algae.

Scientific literacy is a prerequisite for the third agricultural revolution. A scientifically literate nation will formulate policies that will encourage innovation, deploy its best minds to the service of science and technology, and create a public that is receptive to new ideas. Even as we look to the future, the struggle for public acceptance of the third agricultural revolution is taking place today. There are existing biotechnologies waiting to be used, such as
transgenic crops, livestock, forest trees and fishes. These will not prosper if public reaction and corresponding government regulation is guided by imagined risks rather than demonstrated benefits. The paper argues for a system of regulation that will achieve an appropriate balance between the need to assure the public of the safety of agricultural biotechnology and the imperative to explore new technology for solving the problems of modem living. (Author's abstract)

Keywords: Biology, Agricultural biotechnology, Biotechnology, Green revolution, Transgenic crops, Recombinant DNA

Transactions of the National Academy of Science and Technology, Volume No. 28 Issue No. 2, 265-294 (Filipiniana Analytics) Fil(S) Q149.P5 N25 28/2 2006

0131

#### Antimicrobial activity of Chromolaena odorata (L. f.) King & Robinson and Uncaria perrottetii (A. Rich) Merr. extracts Vital, Pierangeli G., Rivera, Windell L.

Ethanol extracts of leaves of Chromolaena odorata (L. f) King & Robinson and ethyl acetate extracts of stem bark of Uncaria perrottetii (A. Rich) Merr. were examined for their antimicrobial properties. C. odorata and U perrottetii extracts were tested against bacteria, namely, Escherichia coli, Pseudomonas aeruginosa, Salmonella typhimurium, Bacillus subtilis, Staphy lococcus aureus; and fungus, Candida albicans. Potential antimicrobial compounds were obtained through solvent extraction and rotary evaporation. To determine the antibacterial and antifungal properties of the extracts, disc diffusion assay was performed and minimum inhibitory concentration (MIC) was determined. C. odorata extracts revealed antibacterial activities, inhibiting the growth of B. subtilis, S. aureus, and S. typhimurium. MIC data showed that 0.5%, 0.1%, and 0.3% were the inhibitory concentrations of the plant extract against B. subtilis, S. aureus, and S. typhimurium, respectively. Results of antimicrobial assay for U. perrottetii extracts showed that only the aqueous extract of this plant demonstrated antibacterial and antifungal activities; inhibiting B. subtilis, S. aureus, and C. albicans. MIC data showed that B. subtilis, S. aureus, and C. albicans can be inhibited at 0.3%,0.1%, and 0.1% concentrations of the plant extract, respectively. The organic extract of U perrottetii showed no activity. Preliminary phytochemical screening revealed the chemical composition of the plant extracts of C. odorata containing flavonoids, saponins, tannins, and steroids, while U perrottetii possessing alkaloids, tannins, and leucoanthocyanin. Thus, these plant extracts can possibly be used to produce alternative forms of antimicrobials. (Author's abstract)

Keywords: Biology, Chromolaena odorata, Uncaria perrottetii, Antimicrobial, MIC, Phytochemical screening

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 74 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0132

Antimicrobial properties of some marine sponge (porifera) from Mactan, Cebu, Philippines Pangan, Abigail Clarice G., Uy, Frederick A., Oclarit, Jose M. Nine species of sponges were collected from the marine waters off Mactan Island, Cebu, Philippines and were screened for antimicrobial activity using ethanol as the extracting medium. One Gram-positive, two Gram-negative bacteria, and two species of fungi were assayed using the standard disk-diffusion method with penicillin, streptomycin, and nizoral as positive controls. Among the nine sponges, only *Haliclona sp.* and *Ircinia sp.* showed antimicrobial activity against *Bacillus subtilis, Escherichia coli,* and *Pseudomonas aeruginosa.* The inhibitory activity of *Haliclona sp.* against *B. subtilis, E. coli,* and *P. aeruginosa* was 24.0 mm, 16.5 mm, and 21.0 mm, respectively, while that of Ircinia sp. was 23.0 mm, 11.5 mm, and 15.5 mm, respectively. Using *Ircinia sp.* extract, the minimum inhibitory concentration (MIC) against E. coli was 3.9 mg/ml while against *B. subtilis* and *P. aeruginosa* using the *Haliclona sp.* extract was 0.8 mg/ml, while that against *B. subtilis* was 1.6 mg/ml. (Author's abstract)

Keywords: Biology, Antimicrobial activity, Bioassay, Haliclona sp., Ircinia sp., Porifera

The Philippine Scientist, Volume No. Issue No. , 35-45 (Filipiniana Analytics) Fil(S) Q1 J95 v.44 2007

#### The antiseptic activity of *Psidium guajava* essential oil de Castro-Ontengco, Delia, Capal, Teresita V.

The use of essential oils as disinfectants and antiseptics is not entirely new. A wide variety of antiseptic compounds in an essential oil make mutation of microorganisms extremely difficult. This study investigated the antiseptic activity of *Psidium guajava*, guava, leaf essential oil against clinical staphylococci, streptococci, *Escherichia coli, Klebsiella pneumoniae*, and *Salmonella typhi*. Its major constituents, eugenol and limonene, were also assayed against standard ATCC strains: *S. aureus* 25923 (Sa), *E. coli* 25922 (Ec), and *Pseudomonas. aeruginosa* 27853 (Pa). Fresh guava leaves were hydro-distilled in a condenser with a clavenger attachment. The guava leaf oil, GLO, was dehydrated with anhydrous sodium sulfate and refrigerated in amber vials. GLO was emulsified in 20% Tween 80 and distilled water (0.1 :0.05: 185), diluted twofold serially with distilled water, and mixed with Mueller Hinton agar ( $\pm$  7% sheep's blood) to final concentrations of 0.5-0.0078% (v/v). Clinical isolates were identified with the Vitek system using GPI and GNI cards. Approximately 10<sup>4</sup> cfus of bacterial suspensions in the logarithmic phase was spot-inoculated on the GLO-MHA plates and allowed to dry. Plates were incubated overnight at 35°C. The minimum inhibitory concentration was read as the least GLO concentration inhibiting bacterial growth. Results indicate that growth of *Staphylococcus* and *Streptococcus* clinical isolates was best inhibited

GLO at 0.03-0.25%, v/v, and  $\hat{a}$ <sup>w</sup>=0.0078-0.25%, respectively. *Salmonella typhi* was inhibited at 0.25-0.5%, and both *E. coli* and *K. pneumoniae* were not inhibited at 0.5%. Eugenol was active against Sa and Ec at 0.125%, while limonene was active against only Sa at 0.25% and did not inhibit Ec and Pa at the highest concentration used, 0.5%. The data suggest that eugenol- a phenolic alcohol, and limonene- a mono terpene could be responsible for the antiseptic property of GLO. This antiseptic property of GLO may be used to formulate topical ointments and personal hygiene products. (Author's abstract)

Keywords: Disinfectant, Antiseptic, Guava leaf essential oil, Biology, Minimum inhibitory concentration, Eugenol, Limonene

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 76 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

## Arsenic and mercury concentrations of the waters and janitor fishes (Pterygoplichthys spp.) in the Marikina River, Philippines

Lam, Jacquiline C., Sia Su, Glenn L.

The Marikina River is an important river basin situated at the eastern side of Metro Manila, Philippines. Since the late 1990s, the Marikina River has been plagued by an invasive species, the janitor fish (*Pterygoplichthys* spp.). Despite this adversity, it continues to provide resources for people who are continuously dependent on the river for their livelihood. However, the Marikina River, like other rivers in the world, is also exposed to heavy metals emitted mostly from anthropogenic sources.

Historically, arsenic and mercury are used extensively for the benefits it provide but continuous use of these metals bring about numerous environmental and health implications that are of great concern. The study aims to assess the total arsenic and total mercury concentrations of the waters obtained and janitor fishes caught from the upstream and downstream areas of the Marikina River in June 2008. Results were analyzed using the t test for unpaired observations at a 95% significance level.

Arsenic and mercury concentrations were detected in the janitor fishes caught and in the waters obtained from the Marikina River. The mean total arsenic and mean total mercury concentrations were 0.001 and 0.084 mg/L, respectively, and the fishes examined had mean total arsenic and total mercury concentrations of 0.015 and 0.012 mg/kg, respectively. The mean total mercury concentrations in the waters exceed the DENR permissible limit of 0.02 mg/L. No significant differences in the total arsenic and mercury concentrations in the waters and in the janitor fishes caught at the upstream and downstream areas of the Marikina River. This study provides the preliminary groundwork in assessing the extent of heavy metal pollution in the waters and janitor fishes in the Marikina River. Findings of this study may eventually guide decisions and policies on the protection of water sources and the lives of people dependent on these waterways. (Author's abstract)

Keywords: Biology, Arsenic, Mercury, River basin, Janitor fish, Philippines

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 66 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### 0135

# Some aspects of the population biology of the green tiger prawn *Penaeus semisulcatus* (De Haan, 1844) from Pilar and Capiz Bays, Northern Panay, West Central Philippines *Villarta, Karen A., del Norte-Campos, Annabelle G.C., Campos, Wilfredo L.*

This study is a first report on the population biology of the green tiger prawn Penaeus semisulcatus (de Haan) from northern Panay, west central Philippines. The study was conducted for eight months (May to December 2002) whereby total lengths of both male and female *P* semisulcatus of various sizes were measured monthly from the catches of municipal trawlers operating at Pilar and Capiz Bays. Based on the Bhattacharya method, a mean growth and rate of 0.78 0.28 1.45 0.39 mm/day were estimated  $\pm$  $\pm$ for males and females, respectively. Using the ELEFAN I method, growth parameters derived for males were  $L_{\hat{a}\hat{z}} = 263$ mm, k = 0.7/yr and a growth index ( $\hat{a}$ ...') of 4.69. On the other hand, growth parameters derived for females were L<sub>â^ž</sub> = 271 mm, k = 1.6/yr and а growth index (â^...') of 5.07.

Based on length-converted catch curve analysis, the total mortality (Z) of the male population is estimated to be 3.61/yr while that of the females is 5.65/yr. Male prawns showed a higher exploitation rate (0.53) compared to that

of the females (0.35) indicating the susceptibility of males to fishing. This study also revealed that trawlers in Pilar and Capiz Bays are already getting small sizes of prawns, without allowing them to reach sexual maturity. Hence, there is a need to increase the present mesh size (2.5 cm) of the cod end of trawls in order to avoid growth overfishing, which may occur with continued increase in fishing effort. Furthermore, the recruitment pattern showed two pulses of unequal strengths and time, dividing the year into a 7-5 month pattern. The said pattern, especially for females, may have resulted from a major and minor spawning peak of the said species during the months of June-September and

#### January. (Author's abstract)

Keywords: Biology, Penaeus semisulcafus, Growth, Recruitment pattern, Mortality, Pilar and Capiz Bays

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 18 Issue No. 1, 1-10 (Filipiniana Analytics) Fil(S) Q1.A3 S4 18/1 2006

#### Assessment of fish fauna in Lake Lanao Salic-Hairulla, Monera, Dico, Hermenigildo M., Derico, Rajulla U.

Lake Lanao is the second largest lake in the Philippines found in Lanao del Sur, Mindanao which has a surface area of 357 sq. km. The lake plays an important role not only for the people living near the area but also for the whole of Mindanao as it is the reservoir of the hydropower plant which supplies energy all over the Mindanao archipelago.

This study was conducted to assess the fish fauna in Lake Lanao. There are three sampling sites: Balindong, Taraka and Lumbatan Lanao del Sur. Sampling periods were started in April and ended in June, 2008. Physico-chemical parameters; water temperature, pH, and dissolved oxygen (ppm) were determined. Fish hook, fishnet and fish arrow were used to catch the species.

Findings show that the area has normal a range of values in terms of its physico-chemical properties. These are the species that are found in the 3 sites: katulong (*Hypseleotris agilis Herre*), kadurog (*Glosogubius guiros* and *G. celebius*), tilapia/mampawi (*Oreochromis niloticus*), pait (*Puntius amarus* Herre), aruan (*Ophicephalus striatus* Bloch), odang (*Macrobrachium sp.*), snail (*Pomacea sp.*) and fry katulong.

There are also endangered species and these are: gurami, aruan, pait and baolan. It was revealed that the major reason for the drastic decline of the endemic fishes was the accidental introduction of white go by and eleotrid in the early 1960s. It might also be due to the use of the destructive method of fishing. It is highly recommended that the government of Lanao del Sur and Marawi City provide a program to conserve and preserve the lake and the fishes found in the lake. (Author's abstract)

Keywords: Biology, Fish fauna, Lake Lanao, Endemic fish species, Endangered speCles

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 102 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Assessment of genetic diversity in *Tectona philippinensis* Benth. & Hook. f. (Verbenaceae) inferred from *TRNL* intron sequences *Agoo, Esperanza Maribel G., Oyong, Glenn G.*

Genetic diversity within and among three populations of *Tectona philippinensis* Benth. & Hook. f. (Verbenaceae) is analyzed based on *trnL* intron sequence variations. Leaf samples were collected from Luzon Mainland (Lobo and San Juan, Batangas) and Iling Island (Occidental Mindoro). DNA extraction, PCR amplification, DNA sequencing, sequence alignment genetic variation and statistical analysis were consequently conducted. The *trnL* intron sequence of T. philippinensis has about 505-520 bps with a G/C content of 34%. Cluster analysis shows that the sequences of the *T. philippinensis* are unique from its close generic relative in the family Labiatae. It also shows that the three populations of *T. philippinensis* are homogenous, with unique sequences expressed in some Iling Island individuals. Except for the homogenous composition in Lobo, the calculated haplotype diversity for the population is 0.257 and nucleotide diversity of 0.00077-0.00227. The lower nucleotide diversity within the San Juan individuals (0.00077) and within Lobo individuals (0.0) indicate that these mainland (sub)populations are relatively derived compared to the Iling group (0.00227).  $F_{ST}$  values of 0.023-0.047 indicate negligible genetic values of 0.023-0.047 indicate negligible genetic differentiation. Sequence polymorphism analyses using neutrality tests show that there is only one population for the species with a tendency to develop two subpopulations, i.e., Iling subpopulation and San Juan-Lobo) population. (Author's abstract)

Keywords: Biology, Philippine teak, Threatened plants, Genetic diversity, Population genetic structure

The Philippine Scientist, Volume No. Issue No. , 80-98 (Filipiniana Analytics) Fil(S) Q1 J95 v.45 2008

#### Bacillus subtilis 168 endoglucanase binds to chemical soils under diverse conditions Cruz, Wilma T., Yun, Han Dae

The *bglC* gene of *Bacillus subtilis* 168 was cloned and the BglC protein was characterized. The endoglucanase was active in a wide pH range (3-12), retaining 50-60% of its activity even at the extreme pH values. The protein exhibited highest adsorption to montmorillonite followed by kaolinite then sea sand. There was visual evidence of enzyme binding to the soil surface using a BglC-Green Fluorescent Protein fusion. BglC binding to montmorillonite was shown to be negatively affected by low pH (PH 3) but not pH 10-11. Binding of the protein to kaolinite was not pH-sensitive. The enzyme's binding and activity were not affected by up to 1M NaC1. Our results provide further evidence for enzyme-soil binding via electrostatic interactions between the positively charged protein molecule and the negatively-charged soil surface. (Author's abstract)

Keywords: Biology, bglC, Endoglucanase, Soil binding, Chemical soils (montmorillonite, kaolinite, sea sand)

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 55 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Banana root endophytes: potential biocontrol agents for vascular wilt disease

#### Dagamac, Nikki Heherson A., Sogono, Paolo G., Cabalfin, Rizza Celina B., Adducul, Andre Cedric Y., dela Cruz, Thomas Edison E.

Banana (Musa spp.) is considered one of the major agricultural crops in the Philippines. However, it is continuously being plagued by pests and diseases of microbial origin, e.g. the fungus Fusarium oxysporum, the causative agent of vascular wilt disease, and may result in huge economic losses. Application of agrochemicals, though effective, often results in environmental problems and health hazards. Thus, the use of endophytic fungi as biological control agents poses a novel and promising alternatives for plant disease management. Our research study then aims to test locally isolated banana root endophytes (BRE) for their potential as biological control agents against F. oxysporum. A total of seventy-five BREs were isolated from root samples of mature, asympromatic banana cultivars collected from different sites in Manila and Quezon City. Highest species richness (d) was observed from plants collected from Lagro (d=8.89) and Commonwealth Avenue (d=8.50) in Quezon City. Twenty-five selected isolates were then screened for their antagonistic interactions against F. oxysporum using the dual culture method. Only three inhibited the test fungus either on contact (BRE 18 and BRE 71) or at a distance (BRE 14). Morphocultural characterization identified them as those belonging to the genus Aspergillus. Further antagonistic testing showed that the three BREs significantly reduced the colony radial growth of F. oxysporum. Extraction of secondary metabolites was further conducted to test the antifungal properties of the three BREs. Crude culture extracts failed to inhibit the fungus using the paper disk diffusion assay. However, it showed remarkable decrease in spore germination. Thus. the isolated banana root endophytes (BRE) showed their potential as biocontrol agents. (Author's abstract)

Keywords: Biology, F. oxysporum, Aspergillus sp., Fungal endophytes, Biocontrol, Musa sp.

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 54 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### 0140

#### Biodegradation of banana stalks and sweet sorghum bagasse under solid state culture of *Pleurotus sajor caju Agrupis, Shirley C., Simpliciano, Rolayson C., Ulep, Roque P.*

Banana stalk fiber (BSF) is the dried fibrous waste generated after the banana fruits are harvested while sweet sorghum bagasse (SSB) is the fibrous residue after the juice has been extracted from the sweet sorghum stalks. In this study, BSF and SSB were processed under solid state culture conditions with *Pleurotus ostreatus* and the effect of this fungal culturing on the biodegradation of these lignocellulosic residues was evaluated. Fungal growth was carried out at 50% moisture level for 30 days. Total carbohydrate, reducing sugar, monosaccharide glucose and fructose of the water hydrolysate of the fungal-treated and untreated samples were analyzed using colorimetric, somogys, nelson, and HPLC procedures, respectively.

The treated BSF and SSB gave a total sugar of 60.47 and 52.37 % respectively, while only 14.8 and 11.1 % were observed in their untreated counterparts. Glucose was only detected in the hydrolysate of the treated samples where SSB gave 0.053g/L and BSF showed 0.042 g/L. Xylose was not detected in either of the treated and untreated samples. The test on reducing sugar confirmed that most of the water soluble sugar in the hydrolysate are oligosachmides (partially degraded cellulose). Lignin content of the two samples was significantly reduced by the fungus.

The results showed the potential of the edible fungi in degrading lignocellulose materials for cellulose ethanol production. (Author's abstract)

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 53 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Biodiversity and status of butterflies in the vicinity of Mountain View College, Mt. Nebo, Valencia City

Sumagaysay, James B., Sumagaysay, Charity Joy L.

To establish a local data base on butterfly composition and richness, biodiversity of species were determined at the Agriculture Garden, Balambangan Area, Hydro II Mini-forest and Malingon Mini-forest sites of Mountain View College using 40 m line transect sampling. BIOPRO software version 2 was used in the analyses. Survey showed 49 species, 33 genera, and 5 families of butterflies. One species (2.0%) was very common, 22 species (44.9%) were common, 10 species (20.4%) were rare, and 16 species (32.7%) were undetermined. From highest to lowest, diversity indices were Malingon Mini-forest (H=1.519), Hydro 2 Mini-forest (H=1.415), Agriculture Garden (H=1.176), and Balambangan Area (H=1.146). Bray-Curtis analysis revealed 2 clusters of habitats. Cluster 1 (81% similarity) at Malingon and Hydro II Mini-forests had dense trees, river systems, and nectar sources which probably favoured the presence of rare and endemic species. Cluster II (73% similarity) at Agriculture Garden and Balambangan Area had human settlements, sparse tree distribution and inhabited by the common species. These results suggest that the highest diversity which includes rare and endemic species could be found in dense forest habitat with presence of water sources and minimal human disturbance. Continued monitoring will establish population and species richness trends and inform ecological measures to preserve endemic and rare species. (Author's abstract)

Keywords: Biology, Butterflies, Biopro software, Bray-Curtis analysis

Asian Journal of Biodiversity, Volume No. Issue No., 142-155 (Filipiniana Analytics) Fil(S) OH75.A1 A85 v.3 2012

0142

#### Biological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae) Bilog-Obra, Glenda P., Morallo-Rejesus, Belen

The parasitoid, *Aphytis* sp. nr. *chrysomphali* was collected from coconut scale, California red scale and Florida red scale attacking citrus in August 1989 from Villaverde, Nueva Vizcaya. The biology of the parasitoid on coconut scale, Aspidiotus destructor Signoret reared on squash was studied.

The total developmental period of the uniparental (thelytokous) parasitoid from egg deposition to adult emergence ranges from 13-15 days with a mean of  $14.18 \pm 0.90$ .

The longevity of adult *Aphytis* sp. nr. *chrysomphali* fed with honey ranges from 4-22 days with a mean of  $8.45 \pm 4.12$  days whereas starved adults lived only to a maximum of 33 hours. The total fecundity ranges from 9-24 eggs with a mean of 16.44 eggs. (Author's abstract)

Keywords: Biology, Aphytis sp. nr. chrysomphali, Parasitoid, Coconut scale, Scale insects, Biology, Aphytis

The Philippine Entomologist, Volume No. 14 Issue No. 2, 137-147 (Filipiniana Analytics) Fil(S) QL461 P5 14/2 2000

#### Biology of the orchid weevil, Orchidophilus aterrimus (waterhouse) Hirao, Gliceria A., Gabriel, Bernardo P., Facundo, Henry T.

The orchid weevil, *Orchidophilus aterrimus* (Waterhouse), went through egg, five larval instars, pupa and adult stages in 64.72 days on *Dendrobium* leaves and 81.50 days on whole plants. These developmental rates are faster than those reported in Hawaii. Its small oval eggs were laid singly and inserted on the feeding sites of adult weevil either on the stem, leaves or flowers. Newly hatched larva was translucent, later became white to yellowish white and retained this color during the rest of its larval development. The wrinkled legless larva began feeding upon hatching and soon tunneled into the plant. Mature larvae are 5.50 - 8.00 mm (x =  $6.63 \pm 0.64$ ) long and 1.50 - 2.25 mm (x =  $1.78 \pm 0.26$ ) wide. The pupa is exarate, with well-developed legs and prominent outline of the wings and antennae. Newly emerged adults remained in the pupal cell and did not feed for at least ten days. They were light to dark brown and became totally black in about seven days. While the larva bores through the stem, adult feeds on flowers and tender tissues. Male and female adults are 4.25 and 1.97 mm long, and 4.43 and 2.03 mm wide, respectively. (Author's abstract)

Keywords: Biology, Coleoptera, Curculionidae, Life history, Orchid pest, Orchid weevil, Orchidophilus aterrimus

The Philippine Entomologist, Volume No. 15 Issue No. 1, 67-73 (Filipiniana Analytics) Fil(S) QL461 P5 15/1 2001

0144

#### Bioluminescent bacteria as bioindicator of marine environmental stress in Iligan City Gayanelo, Phoebe Jean B., Fanuncio, Lady Jane C., Lahoylahoy, Lucilyn D.

Iligan City, the industrial city of the south, houses several industrial units. However, industrial progress poses tremendous threats to environmental health. The need to manage balance between industrialism and environmentalism should be prioritized so as to promote good environmental quality amidst industrialized development. Water quality along coastal areas adjacent to industrial sewages in Iligan City was monitored for toxic chemical contamination via bioindicators. Bacterial bioindicators were used in detecting environmental stress and contamination. Free living bioluminescent bacteria (*Vibrio* sp.) isolated from oxeye scad (*Selar boops*) and cuttlefish (*Sepia* sp.) were evaluated in terms of its ability as a bioindicator. The water samples obtained from selected sites near industrial units (cement factory, oil depot and chemical manufacturing company) were evaluated using a bioluminescence reduction and inhibition assay. Water samples showed high rate of decline in light intensity upon the first four hours of inoculation; about 56% in samples adjacent to cement factory, 65% in samples close to fuel oil depots and 82% in samples within the vicinity of a chemical manufacturing company. Variances among light intensity reduction rates were highly significant, thus the concentration of contaminants within sampling areas can be determined based on the reaction of bioluminescent bacteria. Results of the bioluminescence reduction and inhibition assay suggest that the water samples collected nearby industrial units were chemically contaminated and

proved to be biohazardous due to rapid reduction of bioluminescence. Finally, the use of bioluminescent bacteria provides a simple, fast, inexpensive and efficient alternative environmental monitoring technique, thus it should be considered for regular detection of contaminants and evaluation of water quality. (Author's abstract)

Keywords: Biology, Bioindicator, Bioluminescent bacteria, Vibrio sp., Bioluminescent reduction and inhibition assay, Contamination

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 60 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0145

### Bioremediation: a proven and cost effective tool for repairing the environment *Koenigsberg, Stephen S., Raymundo, Asuncion K.*

About twenty years ago, bioremediation, the art and science of harnessing the natural metabolic processes of everything from simple microorganisms to plants, to destroy or sequester contaminants, became a real option. The potential to engineer these processes created a new alternative to capital and management intensive mechanicallydriven protocols and a thriving industry arose to serve this new strategic approach. We are now experiencing a maturation of this "era of bioremediation", which is further being accessorized with in-situ thermal and chemical oxidation processes for more rapid initial site impacts. Taken all together we are moving into an "era of in-situ treatment", but regardless of how one intervenes with thermal or chemical energy in a contaminated area, biological processes ultimately are needed to finish the operation. Further, there have been many exciting new developments in molecular biology that are now enhancing the science of bioremediation, such that with a more refined understanding of key biological players and processes we can better design and manage bioremediation engineering.

The Republic of the Philippines is like any other with a modern economy- it has severe environmental problems that have reached crisis proportions. However, as an island nation with limited territory, these problems have a special insidious feature; there is no place to run. Fortunately, with the help of powerful natural processes like bioremediation that work around the clock without supervision we have the tools to heal the environment cost-effectively. Consequently, the National Academy of Science and Technology formed a Bioremediation Research Team (BRT), which, after a series of meetings, decided to focus on unattended sources of hazardous wastes, with a special emphasis on the problems of the mining industry.

The issuance of Executive Order No. 270 - the National Policy Agenda on Revitalizing Mining in the Philippines, (January 16,2004), and the favorable Supreme Court decision on the Philippine Mining Act 7942 of 1995, have led to the revitalization of the local minerals industry, which had become nearly dormant prior to the decision. Such decisions elicited hope in both public and private sectors that a revitalized mining industry could boost the economy; however, there are two main issues attached to the mining industry: abandoned mines and the management of mine wastes. How can bioremediation help? Well, from the top down, we have phytoremediation which harnesses the healing aspects of plants for the more surficial aspects of these abandoned mines while subsurface engineered biological barriers, which rely on microorganism activity, address contaminated aquifers.

The BRT proposes to conduct a project on Field Test Applications of Phytoremediation and Microbial Technologies for the Rehabilitation of Contaminated Mine Sites. This project will utilize established heavy metal resistant plants. Jatropha curcas, commonly known as "tubang bakod", is a prime candidate as it thrives in marginalized land and the nuts can be used as source of biodiesel.

Other projects on "The Use of Local Bioremediation-based Technologies for the Management of Wastes from the Mining Industry" are also being proposed. The BRT, composed of microbiologists, chemists, botanists, foresters,

and plant biologists, believes that bioremediation projects are worth pursuing should funds become available. (Author's abstract)

Keywords: Biology, Bioremediation, Waste management, Mining, BRT, Philippine Mining Act 7942

Transactions of the National Academy of Science and Technology, Volume No. 28 Issue No. 2, 301-304 (Filipiniana Analytics) Fil(S) Q149.P5 N25 28/2 2006

0146

#### **Bioresource management and our common future** *Rola, Agnes C., Gomez, Edgardo D., Macaranas, Federico M., Magno, Francisco A., Ong, Perry S.*

Survival of societies largely depends on biological (bio) resources management, which is the responsible use of living resources - plants and animals, and the natural environment that support these, for both traditional and new applications. Bioresources are of two levels - ecosystems and species. Bioresources' utility also vary temporally and spatially. In the early times, when population growth was low and customary rules prevailed, bioresources were not under threat. Collective action evolved in the villages to safeguard the land, water and the biological resources for sustainable use. As countries developed, the state became the more powerful steward of all resources. While protected areas in forests and marine sanctuaries were set-up, the weak property rights, the lure of commercialism and the seeming lack of collective action to protect these resources have led to resource degradation in recent times. It is hypothesized that governance through policies and institutions influence bioresources conditions. At the ecosystem level, the four cases of best practices cited in the paper showed that community participation, external support and local government leadership were factors for sustainable bioresource management. Species management practices have a dearth of documentation; and the paper poses some management strategies for this level. Among the recommendations is the critical role of science and technology in the development of bioresource management plans and in monitoring of desired outcomes. (Author's abstract)

Keywords: Biology, Bioresource management, Governance, Policy instruments, Institutions, Genetic diversity

Transactions of the National Academy of Science and Technology, Volume No. 28 Issue No. 2, 227-254 (Filipiniana Analytics) Fil(S) Q149.P5 N25 28/2 2006

#### Cellular and karyological variations in populations of green leafhopper *Nephotettix virescens* (distant) in the Philippines *Papag-Cruz, Rocela B., Barrion, Adelina A.*

Populations of the green leafhopper, *Nephotettix virescens* (Distant), were sampled from rice fields in the Philippines (Albay, Isabela, Laguna, Nueva Ecija, and Zambales) that were infested and non-infested with tungro virus. Males were cytologically and karyologically examined, described and compared. Lacto-aceto-orcein squash preparations of the testes of all *N. virescens* sampled had meiocytes which followed the convertional sequence of reductional-equational divisions. The dominant gametic cells were primarily spermatocytes undergoing Meiosis I stages. In terms of the qualitative features of the meiotic cells of all male *N. virescens* sampled, no obvious variation was detected. However, in terms of the meiotic index, the tungro-transmitting male *N. virescens* had mean index of

86.06% whereas non-tungro-transmitters had 81.70%. All *N. virescens* exhibited normal and regular meiosis. In terms of chromosome number, all *N. virescens* have 2n = 15, the karyotype formula is 7 II + XO. There were two types of spermatocytes: one with (7 IA) and the other with (7 IA + X), the latter was the predominant type. The mean relative lengths of diakinesis chromosome of male *N. virescens* from non-tungro rice fields of five provinces did not vary significantly, while those from tungro-infested fields exhibited heterogeneous measurements, many of which were statistically varied between and among each other: Among the five different rice fields, the male *N. virescens* from Isabela and Nueva Ecija, exhibited significant differences in mean relative lengths of diakinesis autosomes 1, 2, 4 and 6 and X chromosome. Chromosomes 3, 5 and 7 were stable autosomes of both tungro-vector and non-tungro-vector *N. virescens*. (Author's abstract)

Keywords: Biology, Green leafhopper, Nephotettix virescens, Cytogenetics

The Philippine Entomologist, Volume No. 15 Issue No. 1, 75-82 (Filipiniana Analytics) Fil(S) QL461 P5 15/1 2001

#### 0148

#### Characterization of a Î<sup>o</sup>-Carrageenase-producing marine bacterium, Isolate ALAB-001 Tayco, Crimson C., Tablizo, Francis A., Regalia, Raymond S., Lluisma, Arturo O.

Carrageenases are glycoside hydrolases that specifically degrade carrageenan, a highly anionic polysaccharide found in the cell wall of many red algal species. To date, only a few of these enzymes have been characterized, and identifying additional sources is important considering the role of carrageenases in production of carrageenan derivatives. In this paper, we report the characterization of a marine bacterial strain that produces  $\hat{1}^{\circ}$ -carragenase. The strain, which we designate as ALAB-001, was isolated from diseased thallus fragments of the red alga *Kappaphycus alvarezii*, a commercially important source of carrageenan. Genotypic and phenotypic data suggest that the isolate belong to a relatively poorly-characterized group of bacteria in Alteromonadaceae (Alteromonadales) and is closely related to *Marinimicrobium* and *Microbulbifer*. Significant  $\hat{1}^{\circ}$ -carrageenan activity (175 U/mL) was evident when the isolate was grown in the presence of  $\hat{1}^{\circ}$ -carrageenan. Activity against starch was also high (180 U/mL), but activity against agar, alginate, cellulose, i-carrageenan, and  $\hat{1}_{\times}$ -carrageenan was significantly lower (25-50 U/mL). Laboratory-scale production of the enzyme using batch cultures of the isolate was achieved by optimizing culture medium, length of culture time and degree temperature. Optimal growth was observed at 25°C, though the isolate survived at 30°C. An in-house developed seawater-based medium containing equal concentrations of yeast extract and tryptone (YETS) yielded the highest cell growth based on total protein concentration (~3000 µg/mL) and enzyme activity (~ 45 U/mL). (**Author's abstract**)

Keywords: Biology, κ-carrageenan, κ-carrageenase, Carrageena-degrading bacteria, Kappaphycus alvarezii

Philippine Journal of Science, Volume No. 142 Issue No. 1, 45-54 (Filipiniana Analytics) Fil(S) Q1 P55 142/1 2013

0149

A unified account of all known diatoms in the genus *Navicula*, class Bacillariophyceae, of the Philippines from 1886 to 1987 is presented. A total of 226 taxa are listed. Included herewith are the references that originally described or cited the taxon and the ecological/habitat records for each taxon. As much as possible, a list of exsciccata materials is given together with their repository places. (Author's abstract)

Keywords: Biology, Navicula, Bacillariophyceae, Philippines, Diatoms

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 13 Issue No. 1, 1-32 (Filipiniana Analytics) Fil(S) Q1.A3 S4 13/1 2001

0150

### Comparative treament of *Pseudomonas aeruginosa* burn wound infection using bacteriophage MB08 and antibiotics

Abengana, Justin Paolo B., Gemzon, Irni Mark C., Leung, Jonathan Mark S., Mamauag, John Carlo A., Nolasco, Jr., Jose C., de Jesus, Ma. Sheila M., Papa, Donna May D.C.

Bacteriophage therapy is a potential alternative to antibiotics in combating multidrug resistant pathogens. The efficacy of antibiotics and bacteriophage were evaluated in the treatment of burn wound infection induced with *Pseudomonas aeruginosa*. A third degree burn wound was performed in Sprague-Dawley rats and infected with *P. aeruginosa* via topical route. The efficacy of antibiotics (Colistin and Gentamicin) topically applied daily was compared against the efficacy of *P aeruginosa* Phage MB08 in hydrogel also applied topically but only in a single time on the burn wound. In comparison to untreated control rats, those treated with a single dose of bacteriophage showed significant reduction in the number of bacteria present in the rat's blood and displayed a notable difference in their state of health. On the other hand, rats administered with antibiotics showed less potency in treating the burn wound infections. The results showed that Phage MB08 has therapeutic significance in treating burn wound infections in rats since a single topical application of this phage was able to rescue rats from infection caused by *P. aeruginosa* in comparison to multiple topical applications of antibiotics. (**Author's abstract**)

Keywords: Biology, Pseudomonas aeruginosa, Bacteriophage, Colistin, Gentamicin, Sprague-Dawley

Acta Manilana, Volume No. Issue No. , 77-81 (Filipiniana Analytics) Fil(S) Q181 A81 v.60 2012

0151

#### Comparison of conventional plate assays with DNA-based screening protocols for protease and cellulase production from putative *Bacillus* isolates

Rañoa, Diana Rose E., Lumibao, Candice Y., Roxas, Jennifer L., San Luis, Boris B., Hedreyda, Cynthia T.

Putative *Bacillus* isolates obtained from mud and soil samples of Mt. Makiling, Los Ba $\tilde{A}$ ±os, Laguna were screened for the production of either cellulase or alkaline protease using cellulose and casein plate assays, respectively. Five out of eight isolates assayed for cellulase activity tested positive. DNA from these eight samples were extracted using the modified ROSE method for slot blot hybridization with cellulase gene probe. Out of the five samples positive for the cellulose plate assay, only three exhibited hybridization results. DNA from the eight isolates were used as templates for PCR amplification using primers specific for *B. subtilis* cellulase gene. Out of the

eight isolates, two produced the expected 350-bp cellulase amplicon. Another set of ten putative *Bacillus* isolates were screened for the production of alkaline protease using casein plate assay. Four isolates exhibited protease activity. Genomic DNA extracted from ten isolates were subjected to slot blot hybridization using a fragment of alkaline protease gene from *B. pumilus*. Five isolates, of which four previously tested positive for protease activity, showed positive hybridization signals. PCR analysis using primers designed based on alkaline protease gene of *B. pumilus* showed that only one isolate produced the expected 320-bp PCR amplicon. These data suggest that biochemical plate assays may be advantageous for isolating bacteria that produce different types of cellulase and alkaline protease, while DNA-based methods are useful in detecting specific target genes but may therefore miss out on novel or variant enzymes. (Author's abstract)

Keywords: Biology, Bacillus, Alkaline protease, Cellulase, Slot blot hybridization, Polymerase chain reaction (PCR)

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 17 Issue No. 1, 31-36 (Filipiniana Analytics) Fil(S) Q1.A3 S4 17/1 2005

## Comparison of pollen abortiveness in four weed species treated with mercuric chloride *Regis, Emelina G., Lagunzad, Daniel A.*

Pollen grain abortiveness due to mercury exposure was investigated in four species of weeds, namely *Cleome rutidosperma* Mart., *Commelina diffusa* Burm.f., *Ludwigia micrantha* (L.) Hara, and *Stachytarpheta jamaicensis* (L.) Vahl. All four species tested showed mean pollen grain abortion rates significantly higher than those of their unexposed cohorts. Pollen grain abortion was manifested by reduced size and staining deficiencies. Scheffe's test for variability indicated that higher mercury concentrations are required to effect changes in pollen grain abortiveness. The weed species tested can possibly be used as bioindicators of mercury pollution. Because of the plant's ability to absorb mercury, these species can also be considered as possible bioremediators. (Author's abstract)

**Keywords:** Biology, Pollen abortiveness, Mercury, Bioindicator, Cleome rutidosperma, Commelina diffusa, Stachytarpheta jamaicensis, Ludwigia micrantha

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 14 Issue No. 1, 21-27 (Filipiniana Analytics) Fil(S) Q1.A3 S4 14/1 2002

#### 0153

#### CpG oligodeoxynucleotides as immunomodulators of rBlo t 5-induced allergic reactions Ramos, John Donnie A., Chua, Kriesler William S., Dela Pena, Kristoffer C., Denoga, John Joseph L., Gamboa, Leolina Remeceta M., Hernandez, Alyssa L.

Unmethylated oligodeoxynucleotides (ODN) containing CpG motifs have been implicated to playa role in shifting allergic Th2 response to a less inflammatory Th1 reaction by modulating cytokine and antibody expressions. The immunomodulatory role of CpG-ODN in the regulation of sensitization to the house dust mite *Blomia tropicalis* recombinant Blo t 5 allergen in BALB/c mice was determined in this study. The immune response of BALB/c mice administered with rBlo t 5 + CpG, rBlo t 5 alone, or PBS were determined through the production of immunoglobulin subclasses and the cytokines IFN- and IL-4. Pre-treatment with CpG ODN resulted in elevated IFN- and rBlo t 5-specific IgG2a antibody expression. Moreover, CpG-treated mice showed significantly

reduced IL-4 and IgE production compared to the Blo t 5-treated and placebo groups (p<0.05). Results obtained in this study confirmed that CpG ODN exhibit immunoprophylactic effects on rBlo t 5-iduced allergic reactions. Its use as an adjuvant in the development of highly effective vaccine and immunotherapeutic reagent against house dust mite allergy is highly

recommended. (Author's abstract)

Keywords: Biology, Oligonucleotide, Allergy, Blomia tropicalis, Recombinant allergen, Immunomodulator

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 81 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0154

#### Degradation of pyrene, fluorene and fluoranthene: the role of lignin peroxidase and manganese peroxidase from Ganoderma lucidum

### Dedeles, Gina R., Baldueza, Vanessa D., Salcedo, Mary Joy L., Santos, Kharla Jane L., Singh Shah, Geeta C., Solis, Angeline Dawn E.

Reports on the medicinal properties of *Ganoderma lucidum* are extensive, yet little is known of its ligninolytic system and bioremediation potential. The most ubiquitous ligninolytic enzymes produced by this fungus, lignin peroxidase (LiP) and manganese peroxidase (MnP) cultured in N-rich and N-poor media, respectively, were explored for their ability to degrade polycyclic aromatic hydrocarbons pyrene, fluorene and fluoranthene. Mycelia collected after 3 d culture were incubated for 21 days in both N-rich and N-poor media containing Polyaromatic hydrocarbons (PARs) (20 mg fluoranthene, 2.5 mg pyrene and fluorene, respectively) with shaking at 30°C. Metabolites were extracted with ethyl acetate and analyzed by Fourier Transform Infrared Spectroscopy (FTIR) and Thin Layer Chromatography (TLC). Results showed that crude LiP and MnP have the ability to distort the aromatic rings of fluorene, thus transforming C=C to C-CH indicating a reduction in its aromaticity. In contrast, LiP and MnP were able to reduce the amounts of pyrene and fluoranthene but were not capable of their transformation. Analysis by TLC revealed the presence of these PAH metabolites but were not yet further characterized. (Author's abstract)

**Keywords:** Biology, Ganoderma lucidum, Lignin peroxidase, Manganese peroxidase, Bioremediation potential, Polycyclic aromatic hydrocarbons, Lignin degrading activity

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 58 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0155

#### Development of biochemical procedures for the diagnosis of genetic disorders Reyes, Marita V.T., Zafra, Racquel G., Estrada, Sylvia C., Brizuela, Nancy

Normal patterns of carbohydrates, amino acids, alpha keto-acids and mucopolysaccharides in the urine of newborns, infants and children (n = 118) were established. Comparison with those found in the case group (n=429) that included cases of developmental delay, seizure disorders, mental retardation, autistic behavior, multiple congenital anomalies, multiple skeletal deformities, sepsis, meningitis, etc. highlighted significant findings.

The biochemical procedures done include the common screening procedures for phenyketones, a-keto acids, reducing sugars, tyrosine, cystine and mucopolysaccharides; one- and two- dimensional thin layer chromatography for identification of amIno acids, ketoacids and sugars and cellulose acetate electrophoresis for identification of mucopolysaccharides.

In addition to glucose, several in the case group had other sugars like fructose, galactose, xylose and lactose in various combinations. There were twenty in the case group found to be positive for phenyl ketones, 24 for alphaketones and one positive for cystine. Various amino acid patterns: a generalized increase or an increase in specific amino acids (e.g. glycine, alanine, beta-alanine, methionine, proline, OH-proline, tyrosine, histidine, lysine, glutamate, leucine, isoleucine and valine) were also demonstrated.

The normal samples that were positive in the turbidity test for mucopolysaccharides were found to have chondroitin sulfates A and C by electrophoresis. However 48 in the case group were found to have urinary heparan sulfate and dermatan sulfate either singly or in combination in addition to chondroitin sulfates A and C.

The study established reference data on urinary metabolites in infants and children. It also documented the presence of inborn errors of metabolism among Filipino children. (Author's abstract)

Keywords: Biology, Carbohydrates, Amino acid, Alpha keto-acid, Mucopolysaccharides, Urine, Infants and children

NRCP Research Journal, Volume No. 3 Issue No. 2, 1-37 (Filipiniana Analytics) Fil(S) Q179.9 N323 3/2 1993

## Developmental Biology of the Supermale YY Tilapia (*Oreochromis niloticus*): histogenesis of the reproductive system

## Herrera, Annabelle A., Cruz, Rinella R., The fish genetics breeding program-genetic manipulation for improved tilapia project

Histogenesis of the reproductive system of supermale (YY) tilapia and XY tilapia reared at the Central Luzon State University was analyzed with the use of paraffin sections. In the course of development, the primordial germ cells appeared at the same age in YY and XY males, i.e., at 8 days posthatch. These cells which were larger in the YY (1.85  $\mu$ m) than in the XY male (0.9  $\mu$ m) later established themselves in the gonadal anlage by days 9-22. The lobules appeared earlier in the YY at day 15. Blastema of the reproductive duct appeared in the YY at day 23 and in the XY at day 27. By day 79, meiotically active cells were abundant in both groups. By day 95, the YY fish showed mature sperm cells in the fully differentiated testis while it was at day 105 in the XY fish. The supermale consistently demonstrated bigger testis, with thicker somatic tissues, more spermatogenic cells, and more advanced developmental stage than XY fish of the same age. Germ cell and nuclear size in the YY and XY fish were not statistically significantly different, although the general trend was that spermatogenic cells were bigger in the supermale tilapia. ANOVA ( $\hat{l} \pm = 05$ ) showed significant difference in size of the testis, spermatocysts, and vas deferens. The study showed that with the same rearing conditions and same age, the larger supermale tilapia has superior reproductive capacity with its larger testis and ducts, faster histogenesis and spermatogenesis, and higher gonadosomatic index (GSI). (Author's abstract)

Keywords: Biology, Developmental biology, Supermale tilapia, Histogenesis, Reproductive system

### Distribution of anuran species in Loboc Watershed of Bohol Island, Philippines Jose, Reizl P.

The Philippines is rich in biodiversity and Bohol Island is among the many places in the country requiring attention for conservation efforts. For this reason, a survey of anurans was conducted in Loboc Watershed, the forest reserve in the island. Different sampling techniques were used. Three transect lines was established and were positioned perpendicular to water bodies parallel to the existing trails. A 10x10 meter quadrat size was established along each transect line. A visual encounter technique was used along each established quadrat and identification was done using a field guide. Fifteen species of anurans were recorded. One species belongs to families Bufonidae (*Bufo marinus*) and Megophryidae (*Megophryis stejnegeri*); two to family Microhylidae (*Kalophrynus pleurostigma* and *Kaluola picta*); six family Ranidae (*Fejervarya cancrioora, Limnonectes leytensis, Limnonectes magnus, .Platymantis guentheri, Playmantis corrugatus,* and *Rana grandocula*) and five Rhacophoridae (*Nyctixalus spinosus, Polypedates leucomystax leucomystax, Polypedates leucomystax quadrilineatus, Rhacophorus appendiculaius* and *Rhacoporus pardalis*). The disturbed nature of the area still recorded endemic and threatened species. This suggests that forests and critical habitats in the area need to be protected and conserved. (Author's abstract)

Keywords: Biology, Bufonidae, Megophryidae, Microhylidae, Rhacophoridae, Anuran species, Ranidae

Asian Journal of Biodiversity, Volume No. Issue No. , 126-141 (Filipiniana Analytics) Fil(S) QH75.A1 A85 v.3 2012

0158

#### Diversity and status of butterflies in Maitum Village, Tandag, Surigao del Sur, Philippines Casio Ramirez, Ray Kristoffer, Mohagan, Alma B.

Diversity and assessment of butterflies of Maitum, Tandag, Surigao del Sur were conducted to provide information on the species composition, diversity and status of butterflies in dipterocarp forest and agro ecosystems. A total of 104 species of butterflies belonging to 68 genera and 5 families were documented. Species richness of the butterflies was higher in the dipterocarp forest (89) than the agro ecosystem (51). The dipterocarp forest had greater mean individual (4.173) than the agro ecosystem (3.712). The diversity level was fair in dipterocarp forest (H'= 1.638) as compared to the agroecosystem area with low level of diversity (H'= 1.369). Dendrogram for similarity of species composition showed a fairly low species between the two study stations, this suggests the importance of the two habitats for the conservation of butterflies in Maiturn Village, Tandag, Surigao del Sur Assessment of status showed that 57 species (54.8 %), were common 16 (15.3%) were rare, 12 (11.5%) were rare Philippine endemics, 6 (5.7%)Philippine were common endemics, 2 (1.9%)common Mindanao endemics, 1 (.96%) rare Mindanao endemic, 1 (.96%) very rare eastern Mindanao endemic, and 9 (8.6%) were undetermined. These results suggest that Maitum, Tandag, Surigao del Sur is the horne of 104 species of butterflies and the dipterocarp forest is the horne of diverse and endemic species of butterflies for conservation. (Author's abstract)

Keywords: Biology, Diversity, Status, Conservation, Butterflies, Maitum Village

Asian Journal of Biodiversity, Volume No. Issue No. , 74-112 (Filipiniana Analytics) Fil(S) QH75.A1 A85 v.3 2012

#### DNA barcoding of birds in the University of the Philippines, Diliman Campus, with emphasis on striated grassbirds *Megalurus palustris*

Luczon, Adrian U., Torres, Andrew F., Quilang, Jonas P., Ong, Perry S., Fontanilla, Ian Kendrich C.

DNA barcoding is increasingly being used by researchers acros the globe to aid in the identification of species. Using this taxonomic tool on bird species in an urban green space within Manila, i.e. the University of the Philippines Diliman campus, Luzon, Philippines, DNA barcodes of eleven species were generated. Different haplotypes for some of the species were observed. Using BLAST, the cytochrome oxidase subunit 1 (COI) sequence of every species from this study was correctly matched with the corresponding species having a COI record in Genbank, with the exception of the Striated Grassbird *Megalurus palustris*, which is a new COI record. The three distinct haplotypes for *M. palustris* were then compared with COI sequences from other members of the sylviid "Old World Warblers" to determine the effectiveness of the DNA barcode in discriminating it with other species. Results show that COI was successful in placing *M. palustris* as a distinct taxon. (Author's abstract)

Keywords: Biology, Cytochrome oxidase I gene, DNA barcoding, Locustellidae, Megalurus, Philippines

Philippine Journal of Science, Volume No. 142 Issue No. 1, 1-11 (Filipiniana Analytics) Fil(S) Q1 P55 142/1 2013

#### 0160

#### Ecology and genetic structure of giant clams around Savu Sea, East Nusa Tenggara Province, Indonesia

Tisera, Wilson L., Naguit, Ma. Rio A., Rehatta, Beatrix M., Calumpong, Hilconida P.

Giant clams are harvested by coastal communities around Savu Sea for food. As one of the important inhabitants of the reef, their status in terms of abundance of adult population and recruits was assessed. The genetic structure of *Tridacna* was also determined for use in the establishment of network of MPAs around Savu Sea. There were four species identified during the survey: *Tridacna crocea, T. maxima, T. squamosa* and *Hippopus hippopus* with *T.maxima* as the most common in all sites. Clam density ranged from 0.33 ind./  $m^2$  to 19 ind./  $m^2$ .

Population subdivision was found to be highly significant among the five *T. maxima* populations as assessed using the Analysis of Molecular Variance (AMOVA). The percentage of total molecular variation within samples was 73.20%, and that among samples was 26.80%, amounting to FST = 0.26798 which is significant (p-value = 0.014). However, pairwise comparison revealed genetic relatedness between some populations. (Author's abstract)

Keywords: Biology, MPAs,, Genetic structure, Genetic relatedness, Giant clams, Savu Sea

Asian Journal of Biodiversity, Volume No. Issue No. , 174-194 (Filipiniana Analytics)

#### Effect of mykovam, beneficial indigenous microbes and compost for improved growth of *Terminalia catappa* in an acidic infertile soil *Bawalan, Ralph Julius G., Ferrolino, Jose Brian A., Zarate, Jocelyn T.*

*Terminalia catappa*, commonly called Talisay, is a very promising tree for mass production due to its rich oil content and multiple medicinal uses of almost all parts of the plant. This study explored the establishment of Talisay in an acidic marginal grassland soil in the nursery with the help of mycorrhizal fungi, beneficial indigenous microbes and compost as soil amendments in addition to chemical fertilizers.

Results showed that application of compost plus chemical fertilizer (CF)(T6) gave significantly ( $p^2$ , giving 30% increase in shoot FW and 28% in leaf area over the CF alone. Treatments T4 (BIM+CF), T5 (Mykovam +BIM+CF) and T6 (Compost+CF) gave similarly the highest total fresh weight or 11.99 g/plant, giving 61 % increase over the CF plants alone. The treatment T4 (BIM +CF) gave significantly the second highest shoot FW, root dry weight (DW), and total DW. Treatments T7 (MYK + BIM +Com+CF) significantly (p(Author's abstract))

Keywords: Biology, Talisay, BIM, Biofertilizers, Compost, Mykovam

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 64 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0162

#### Effects of arbuscular mycorrhizal fungi inoculation on growth and Cu uptake and toxicity of *Desmodium cinereum* (Kunth) D.C. *Adiova, Joden M., Pampolina, Nelson M., Aggangan, Nelly S.*

The effect of arbuscular mycorrhizal fungi (AMF) inoculation on copper (Cu) uptake and toxicity of *Desmodium cinereum* (Kunth) D.C. was studied. This legume produces large amount of biomass that can serve as buffer in areas with high concentration of Cu. Pre-germinated seeds of *D.cinereum* inoculated and non-inoculated with AMF were grown in sand-soil mixture treated with increasing Cu concentration (0, 400, 800, 1200, 1600ppm Cu). Increasing Cu concentration gave a corresponding reduction on height, diameter, leaf area, and biomass of the plants. Root growth and nodule formation at 1200 and 1600ppm Cu level were inhibited (*ppD. cinereum*, make it an ideal tool for phytoremediation of Cu contaminated sites. (Author's abstract)

**Keywords:** Biology, Alleviate, Arbuscular mycorrhizal fungi, Copper, Desmodium cinereum, Phytoremediation, Toxicity

Philippine Journal of Science, Volume No. 142 Issue No. 1, 87-96 (Filipiniana Analytics) Fil(S) Q1 P55 142/1 2013

## Effects of gamma radiation on the testicular cells of corn earworm [helicoverpa armigera (Hubner)]

Rimas, Ma. Filipina M., Ocampo, Pablo P., Ocampo, Virginia R.

The effects of gamma radiation doses, 100 and 150 Grey, on some reproductive parameters of male corn earworm pharates were eveluated. A group of irradiated insects was allowed to develop and the adult test group was obtained. The remaining adults were allowed to mate with normal females and their F progenies were collected. The testes of normal and irradiated pharates, emerged adults and their F1 larval progenies were obtained and histologically examined.

Results show that the spermatogonia are the most sensitive among the different cell types in the testes. This pattern was much exemplified among pupae evaluated immediately after irradiation. The mean values observed on the number of spermatogonia were 112.2, 55.3, and 46.6 for the control, 100 Grey and 150 Grey, respectively. In all test groups examined, the spermatogonia were found to have reduced number and sizes due to radiation treatments. The cells atrophied among irradiated individuals. Significant variations in the number and sizes of cells and cell bundles among test groups were consitently observed in the primary and secondary spermatocytes, and spermatids. Although the apyrene sperms slightly atrophied in the adults and F progenies, the spermatozoa were found to be the most tolerant to radiation treatment. (Author's abstract)

Keywords: Biology, Helicoverpa armigera (Hubner), Corn earworm, Gamma radiation

The Philippine Entomologist, Volume No. 14 Issue No. 2, 159-174 (Filipiniana Analytics) Fil(S) QL461 P5 14/2 2000

## Effects of UV -C on the masking behavior of the green urchin Salmacis sphaeroides (Linnaeus, 1758)

Taguba, Cyril A, Dy, Danilo T., Belleza, Dominic Franco C., Abao, Rex Samuel A

The tropical urchin S. sphaeroides is commonly observed to cover itself with pieces of debris that it picks up from the substrate using its tube feet. This behavior is understood to be a response to bright sunlight. Adult S. sphaeroides were exposed to four different light treatments (dark, photosynthetically active radiation (PAR), UV-C and PAR+UV-C) and quantified the rate of covering response using aluminium foil discs as covering material. Another objective was to demonstrate the harmful effect of UV -C on the covering response of sea urchins. Test urchins covered themselves considerably when exposed to PAR, while UV-C+PAR covered themselves slightly urchins under more than under UV-C alone. Urchins with the least covering response were from the dark treatment. The experiments demonstrated that S. sphaeroides is negatively phototactic and that exposure to UV -C may hinder this response, presumably due to physiological stress. (Authors' abstract)

Keywords: Biology, Salmacis sphaeroides, Effect of light on, Urchin, Green

#### Elastic properties of a biopolymer Ayade, Heev, Licup, Albert james, Bernido, Christopher, Carpio-Bernido, Ma. Victoria, Otadoy, Roland, Bacabac, Rommel

The mechanical and dynamical properties of a cell are primarily determined by the network of biopolymers in the cytoplasm and the nucleus. Furthermore, these constituent biopolymers play an important role in biological functions, such as in facilitating molecular transport within the intracellular environment, in changing structure for movement, and in providing mechanical support to maintain shape. The cell's physiological behaviour, which collectively contributes to the organism's health, is therefore linked with the interplay of intracellular biopolymers. Since each biopolymer in a cell contributes to cell mechanical properties, understanding the physics behind the adaptive elasticity of individual biopolymers is crucial in gaining biological insights on emergent cellular behaviour. In this study, the elastic properties of a single biopolymer under tensile stress were investigated, deriving an beyond elasticity model that is valid thermal regimes.

This novel elastic model was shown to predict the behaviour of stretched double-stranded deoxyribonucleic acid, single-stranded ribonucleic acid, and titin in recent experiments. The model uses the persistence length, which is proportional to the bending rigidity, considering thermal fluctuations, and is validated at minimum bending mode of truncated polynomial expansion. Our newly derived elasticity model fits a broader range of force-extension relations in various types of biopolymers, compared to existing wormlike chain and freely jointed chain models. Therefore, our approach is generically applicable to biopolymers and is applicable to industrial polymers of similar properties. (Author's abstract)

**Keywords:** Biology, Elasticity, Biopolymers, Cell mechanics, Persistence length, Bending rigidity, Wormlikechain, Freely jointed chain, Double-stranded, Single-stranded, Titin, Bending mode

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 175 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0166

#### Enhanced autophagic cell death in expanded polyhistidine variants of HOXA1 reduces PBX1 coupled transcriptional activity and inhibits neuronal differentiation Paraguison, Rubigilda C., Higaki, Katsumi, Nanba, Eiji

HOXA1 is a member of the homeobox gene family and is involved in early brain development. In our previous study, we identified novel variants of polyhistidine repeat tract in HOXA1 gene and showed that ectopic expression of expanded variants led to enhanced intranuclear aggregation and accelerated autophagic cell death in a time-dependent manner. Autophagy has also been reported to have an important role in ageing. Here, we further investigate the implications of poly histidine variants on HOXA1 function. Aside from intranuclear aggregation, we observed cytosolic aggregates during the early stages of expression. Rapamycin, an autophagy inducer, resulted in decreased protein aggregation and cell death. Here, we also show an interaction between variants of HOXA1 and one of the HOX protein known cofactors, PBX1. Expanded HOXA1 variants exhibited reduced PBX1-coupled transcriptional activity through a regulatory enhancer of HOXB1. Moreover, we demonstrate that both deleted and expanded variants inhibited neurite outgrowth in retinoic acid-induced neuronal differentiation in neuroblastoma

cells. These results provide further evidence that expanded polyhistidine repeats in HOXA1enhance aggregation and cell death, resulting in impaired neuronal differentiation and cooperative binding with PBX 1. (Author's abstract)

Keywords: Biology, Autophagy, Cell death, HOXA1, Polyhistidine repeats

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 82 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### 0167

#### Evaluation of Philippine Gemmula: forms related to G speciosa and G kieneri Olivera, Baldomero M.

Gemmula (Weinkauff, 1875) is the largest genus in the subfamily Turrinae (H. & A. Adams, 1853). In this article, Philippine forms of Gemmula with morphological similarities to Gemmula speciosa (Reeve, 1843) and Gemmula kieneri (Doumet, 1840) are evaluated. Two new species, Gemmula sogodensis and Gemmula sikatunai, are described. A group of Gemmula specimens collected from the Western Atlantic appear to be a form of Gemmula sikatunai. The similarity between Philippine and Atlantic forms suggests that Gemmula sikatunai is remarkably stable, long-lived species. (Author's abstract)

Keywords: Biology, Turrinae, Gemmula, Relict species

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 17 Issue No. 1, 1-14 (Filipiniana Analytics) Fil(S) Q1.A3 S4 17/1 2005

0168

#### Evaluation of the potency of generic anticancer drugs against various human tumor cell lines using *in-vitro* cell-based assay and parallel line assay *Florento, Leila M., Tuaño, Elena R., Santiago, Katherine, Matias, Ronald R., Tuazon, Alexander O.*

Anticancer drugs must be cytotoxic and potent enough to successfully treat tumor tissues or cells. Storage and temperature requirements must be strictly monitored and adhered to when transporting these drugs from one facility to another. Deviations from the prescribed storage and transport conditions may impact on the activity of the drug. Potency is an expression of activity of a drug in terms of concentrations required to achieve a desired effect. Relative potency is defined as the potency of any biological product expressed relative to a well-defined reference preparation. The objective of the study was to compare the *in-vitro* cytotoxic activity of generic anticancer drugs and to determine its relative potency in comparison with the originator. In this study the cytotoxic potency of six (6) anti-cancer drugs was determined in an *in-vitro* cell-based assay using different human tumor cell lines. Half-maximal inhibitory concentration (IC50) of the different drugs was obtained from an experimentally derived dose-response curve. The dose-response curve of the different oncology products tested was comparable with the originators. The cytotoxic response based on IC50 varied depending on the cell type used. The relative potency effect of the products was analyzed statistically using Parallel Line Assay (PLA version 111.2.06), which demonstrated that generic oncology products tested had similar efficacy with that of the originator. The products showed equivalent results as proven by both *in-vitro* cell-based assay and statistical analysis. *In-vitro* cell-based assay promises to be a useful and reliable method of demonstrating anticancer drug activity. (Authors abstract)

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 77 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0169

## Fermentation kinetics of gelatin-immobilized *Lactobacillus plantarum* BS using skim milk as substrate

#### Esmeris, Caryl Joy, Calapardo, Marilou R., Del Barrio, Marilyn C., Elegado, Francisco B.

Probiotics should at least have 10<sup>7</sup> CFU/ml count for more effective health benefits. However, a common problems with probiotic products is cell viability especially at ambient conditions. Cell entrapment or may promote viability.

A local lactic acid bacteria isolate, *Lactobacillus plantarum* BS, showed good probiotic properties in previous studies. Entrapment in gelatin was thought to enhance cell viability and create a different form of probiotic drink. The growth kinetics of gelatin-immobilized *L. plantarum* was investigated using 8, 10, and 12% (w/v) skim milk as substrates. Batch fermentation was done at 37°C and agitation speed of 100 rpm. Total sugar consumption, biomass production, titratable acidity, pH and viability of immobilized cells during storage were determined. Maximum growth of *Lb, plantarum* BS was observed at its logarithmic phase, which was  $6.5 \times 10^7$  CFU/ml,  $6.0 \times 10^7$  CFU/ml and  $6.1 \times 10^7$  CFU/ml for 8, 10 and 12% (w/v) skim milk concentrations, respectively. Its stationary phase was observed after 6 h of fermentation. Highest rate of substrate consumption and biomass production were observed at 8% (w/v) skim milk concentration, suggesting substrate inhibition at higher concentrations.

Results also showed that through time, the pH of the substrate dropped while the total titratable acidity increased, suggesting an increase in the lactic acid production. The viability of the microbial cells during storage was also investigated and results showed that the viability of gelatin-immobilized cells was higher than that of the free cells during storage at refrigerated conditions. The growth of gelatin-immobilized *L. plantarum* was best described by the Moser Model yielding a  $\mu_{max}$  value of 0.3556 hr 1 and Ks value equal to  $3.2E+7 \mu g/ml$ . (Author's abstract)

Keywords: Biology, Lactobacillus plantarum, Viability, Probiotics, Lactic acid bacteria, Skim milk, Kinetic study

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 198 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0170

#### Floristic inventory of the Luneta Park, Manila Elazegui, Erwin P., Cruz, Crezzar German V., Canlas, Louvell P.

A floristic inventory of the Luneta Park in Manila was conducted on January 2008. The study provides baseline information on plant resources and generates a listing of plants such as trees, shrubs, herbs, palms and vines. A total of 95 species of plants belonging to 52 families and 81 genera have been documented. There were one gymnosperm and 94 flowering plants. Of these 32 trees, 37 shrubs, 15 herbs, 7 are palms and 3 are vines. Three species are endemic to the Philippines, namely: *Cycas chamberlanii. Heterosphate* 

*philippinensis* and *Podocarpus* sp. Family Palmae/Araceae has the most number of representative species having 15 species types, followed by Family Leguminosae/Fabaceae with 7 species and Family Agavaceae and Family Araliaceae with 5 representative species each. The identified plants are economically important as source of food, medicine, and lumber, others are for ornamental uses. The gathered data will provide useful information on the survival of taxa and promote effective strategies for botanical conservation and environmental awareness. (Author's abstract)

Keywords: Biology, Floristic inventory, Plant resources, Taxa, Endemic species, Botanical conservation

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 100 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0171

# Foliar anatomy of jade vine *Strongylodon macrobotrys* A. Gray (fabaceae): implications of ground and vascular tissue organization to growth and development *Robil, Jan Lorie M., Tolentino, Vivian S.*

Foliar anatomy of threatened tropical vine Strongylodon macrobotrys was investigated, focusing on its stem, petiole and leaflets. Leaves and stems of the vine were collected from Lucban, Quezon. Tissue sections of stems and leaves were processed and their structures were observed under light microscope. Findings reveal that ground ans vascular tissue characteristics have implications to the growth and developemnt of the vine. The stem has thin uniseriate epidermis, compact mesophyll and wide pith, with large isodiametric cells. The vascular cylinders is very distinct, with well developed xylem tissue. Firm xylem tissue in young stem of S. macrobotrys is of great mechanical advantage for its twinning habit since the vine is lacking of other support structures. Transverse sections of S. macrobotrys petiole revealed one distinct ridge vascular bundle which runs from the medial to the distal region of the petiole before reaching the attachment of the first two leaflets. It is suggested that this vasculation pattern has anatomical implications to the plant's trifoliar leaf development. Leaves are dorsiventral with collateral midvein. Four to eight layers of large isodiametric to polyhedral transition parenchyma cells are sandwiched between the palisade and spongy parenchyma which houses most of the lateral veins. The ground tissue organization of the leaves that can be related to the plant's physiology (i.e. metabolism and water storage) is uncommon in the family. It is concluded that the foliar anatomy of S. macrobotrys generally conforms to the anatomy of other plants under Fabaceae. Several anatomical features of the vine have implications to its growth and development, reflecting morphological adaptations, particularly for mechanical support. (Author's abstract)

**Keywords:** Biology, Fabaceae, Foliar anatomy, Included vascular bundle, Transition parenchyma, Strongylodon macrobotrys

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0172

#### Food and feeding habits of *Synodontis nigrita* from the Osun River, SW Nigeria *Olojo, E. A. A., Olurin, K. B., Osikoya, O. J.*

An investigation was conducted into the food and feeding habits of *Synodontis nigrita* from the Osun River near Epe, Lagos, Nigeria. The food items in the stomach of the *S. nigrita* covered a wide spectrum, ranging from various types of plankton to invertebrates and plants. A seasonal variation was also noted in the stomach contents of *S. nigrita* over the period of investigation. The predominant food items found in the stomach were *Polycystis* spp., *Closterium* spp., *Oedogonium* spp., plant tissues, insect parts and detritus. This suggests that *S. nigrita* is an omnivore. (Author's abstract)

Keywords: Biology, Synodontis nigrita, Food habits, Feeding habits, Polycystis spp., Closterium spp., Oedogonium spp., Plant tissues, Insect parts, Detritus

NAGA, WorldFish Center Quarterly, Volume No. 26 Issue No. 4, 21-24 (Filipiniana Analytics) Fil(S) SH1 I81 26/4 2003

#### Four new records and one new species of Philippine myxomycetes from Hundred Islands and Anda Island, Pangasinan

## Kuhn, Rudolf V., Corpuz, Liwayway Hiyas M., Javier, Anton Oliver M., Parra, Christian M., Rodillas, Coleen P., dela Cruz, Thomas Edison E.

Myxomycetes are a morphologically diverse group of eukaryotic microorganisms. Their unique life cycles and fascinating fruiting bodies make them ideal model organisms for study of cellular differentiation. In the Philippines, a country known for its biodiversity, limited studies unfortunately were done on myxomycetes. Our research study thus assesses the diversity and occurrence of myxomycetes in selected islands of Hundred Islands and in Anda Pangasinan. (105)Island. Aerial and ground leaf litter (135), twigs (135) and barks (15) were collected from the islands of Camantiles, Monkey, Children, Governor, Century Park, Sison, and Shell and from Anda Island. Moist chambers (420) were set-up for each of the collected samples and were observed for plasmodia and fruiting bodies to assess their myxomycete diversity. Following incubation for 8 weeks, the moist chamber cultures yielded 34 species of myxomycetes representing 9 genera. Highest myxomycete yield was observed in Century Park Island (51 %) and with aerial leaf litter as substrate (50 %). Arcyria cinerea was the most abundant species among all island sites. Diversity assessment using the Species:Genus (S/G) ratio showed Governor's and Shell Islands as the islands with the highest taxonomic diversity. The Coefficient of Community (CC) indices revealed highest species similarity (0.53) between Governor and Children's Islands. Of the 34 species identified, five species were new records for the Philippines: Craterium microcarpum, Elaeomyxa miyazakiensis, Lepidoderma tigrinum, Perichaena pedata, and Physarum decipiens. (Author's abstract)

Keywords: Biology, Myxomycetes, Biodiversity, Moist chamber set-ups, Hundred Islands, Anda Island

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 101 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Frequency distribution of blood groups ABO, MN and Rh factor in Philippine cosmopolitan, regional, and the national populations *Guzman, Ruth Marian S., Gervasio, Ricardo Noel R., Fontanilla, Ian Kendrich C., Cao, Ernelea P.*

Frequency distribution of blood groups is important as it is used in modem medicine, genetic research, anthropology, and tracing ancestral relations of humans. Blood groups include the ABO, Rh and the MN red cell antigens. The frequency distribution of these three blood groups were obtained and assessed for differences from three populations: (1) a regional population from the town of Cabagan located in Isabela province; (2) a cosmopolitan population from the University of the Philippines' roster of students; and (3) the national population's data obtained from blood banks all over the Philippines. This study sought to determine the frequency distribution of ABO, MN, and Rh factor blood groups to establish whether there exist differences in distribution among the three population categories. Standard blood agglutination sampling was conducted in these populations to determine blood types. Chi-square tests on the genetic frequencies reveal that there is no significant difference in the distribution of blood groups ABO and Rh. The blood group MN, however, displayed twice as many M blood type in the regional population than in the cosmopolitan population. This suggests a localized segregation of alleles responsible for the MN blood type within distinct populations in the Philippines. Computation of the allelic frequencies also revealed that both populations are not at Hardy-Weinberg equilibrium based on the distribution of the different MN blood types. **(Author's abstract)** 

Keywords: Biology, Genetic frequencies, ABO, MN, Rh factor, Hardy-Weinberg equilibrium

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 21 Issue No. 2, 43-49 (Filipiniana Analytics) Fil(S) Q1.A3 S4 21/2 2009

#### The fruit anatomy of Moringa oleifera Lam: a potential plant for healthy active ageing Tolentino, Vivian S., Cang, Santi Rex, Mendoza, Sheila Mae, Musico, Janina C., Panes, Vivian A., Tan Gana, Neil H., Julian, Russell, De Los Reyes, Beni

Moringa oleifera L. commonly called "malunggay" in the Philippines, is considered one of the most economically important species. It is probably the most useful plant in the world, since every part of the plant can be used for food, medicine, nutrition and as a source for oils. It is an important crop in India, Ethiopia, the Philippines and the Sudan, and is being grown in West, East and South Africa, tropical Asia, Latin America, the Caribbean, Florida and the Pacific Islands. The ethnobotanical, nutritional and folkloric uses of the plant are voluminous, and is reported to be acceptable, based on its wide usage in different regions of the country and in Asia. Yet, there have been no known clinical human trials to quantify the effects of Moringa, neither is there any extensive anatomical studies on the plant. Thus this study aims to characterize and describe the anatomy of the peri carp of the fruit at different stages of development. Fruit samples of different ages were processed and sectioned using different microtechniques. The pericarp is differentiated into exocarp, mesocarp and endocarp. The exocarp of the young fruit contained an outer single layer of epidermal cells and subepidermal layers that were composed of 2-3 layers of elongated collenchyma cells and 3-5 layers of polygonal sclereid cells. The epidermis of the exocarp of a mature one is uniseriate with abundant sclerified fiber cells. The fibrous exocarp is tough and hard. The mesocarp showed the vascular bundles, the xylem and phloem. The endocarp showed irregular-shaped parenchyma cells, which differentiated into longitudinally arranged fibers at maturity. This study can used as baseline data in determining the age of malunggay fruit to be used as vegetable and possible use as dietary and industrial fiber. (Author's abstract)

Keywords: Biology, Exocarp, Mesocarp, Endocarp, Uniseriate, Pericarp

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 94-95 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Fruticose lichens from selected sites in Luzon as sources of biologically active lichen acids Borricano, Jayne Nicholei C., Canal, Joecela N., Marcelo, Denisse Marie A., Perez, Myleen Claire P., Santiago, Krystle Angelique A., dela Cruz, Thomas Edison E.

With new and re-emerging diseases, the search for new drugs from natural sources is of urgency. Lichens, a symbiotic association between a fungus and an alga or a cyanobacterium, are known prolific sources of secondary metabolites and thus, can be tapped as new sources of biologically active natural products. Our research study then explores the antibacterial activities of lichen acids extracted from fruticose lichens. Sixty three lichen thalli were collected from different sites in Luzon Island, e.g. Bataan, Batangas, Benguet, Cavite & Laguna. Morphological characterization identified the collected fruticose lichens as Usnea baileyi (3), Ramalina dendriscoides (58), Stereocaulon massartianum (1) and Cladonia gracilis (1). The lichen thalli were then air-dried and their lichen acids extracted with acetone and tested against gram-positive bacteria (Bacillus subtilis, Staphylococcus aureus) and gram-negative bacteria (Escherichia coli, Pseudomonas aeruginosa) using the paper disk diffusion assay. Results showed that all the 45 tested extracts inhibited at least one of the test bacteria. Most of the lichen extracts were found active mainly against gram-positive bacteria. Extracts from R. dendriscoides were observed to be the most active. Selected lichen extracts also showed activity against S. aureus even at a volume of 30 µl. MIC/MBC of two lichen extracts, Rd06 and Rd42, were found to be 156 µg/ml and 2,500 µg/ml, respectively. Detection of lichen acids using TLC showed the presence of at least eight lichen acids. TLC-bioautography detected barbatic acid, stictic acid, diffractaic acid, galbinic acid, norstictic acid, salazinic acid and usnic acid to be the bioactive lichen acids. (Author's abstract)

Keywords: Biology, Fruticose lichens, Lichen acids, Paper disk diffusion assay, TLC, Bioautography

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 72 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0177

#### Genetic diversity of Philippine *Trichomonas vaginalis* isolates using the 5.8S ribosomal RNA gene *Masalunga, Marvin C., Rivera, Windell L.*

Trichomoniasis, a sexually transmitted disease caused by *Trichomonas vaginalis*, is an important but overlooked disease occurring worldwide. Many studies report the various clinical aspects and methods to detect infection with *T. vaginalis*, but there are very few current reports concerning the intraspecies diversity of the organism, which may prove useful in effective epidemiological assessment of the disease. This study aimed to establish the diversity of *T. vaginalis* isolates in a sample population in the Philippines using the 5.8S rRNA gene and associated internal transcribed spacers (ITS), and to synthesize *T. vaginalis*-specific primers from the conserved regions of the DNA sequences. Vaginal and urethral swabs were collected and subjected to culture methods to identify *T. vaginalis*-positive samples. Crude DNA extracts of culture-positive samples were amplified through polymerase chain reaction (PCR) using primer set TFR112. The desired PCR products were purified and sequenced for phylogenetic analysis. Four haplotypes were identified from the sample population, each differing from the designated standard

haplotype by a single nucleotide residue. The putative rRNA region is highly conserved, and BLAST searches indicate that it is unique to *T. vaginalis*. GC rich-regions unique to the four haplotypes were identified from the sequence alignments, and these were used to develop new *T. vaginalis*-specific primers. A phylogenetic tree was generated which proved the monophyly of the species under genus *Trichomonas* and the monophyly of the isolates used in this study. The synthesized primers were tested through PCR using the same samples, and they were found to be 100% sensitive. The results prove promising in further epidemiological studies, especially those that will make a concordance between strains and clinical states. Results can also be used as basis for the improvement of current methods in diagnosing trichomoniasis. (Author's abstract)

Keywords: Biology, Trichomoniasis, Trichomonas vaginalis, Polymerase chain reaction (PCR), DNA sequencing, Haplotypes,, Phylogenetic tree

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 88 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Genetic variability within the population of the vulnerable Mindanao endemic Blue-Capped Kingfisher (Actenoides hombroni) using polymorphic DNA markers Fernandez-Casim Lothy, Nuneza, Olga M., Teves, Franco G.

The restricted range and small population size of Mindanao endemic blue-capped kingfisher (*Actenoides hombroni*) and the degradation of its habitat provide an ideal case to study the genetics of this species. DNA samples were taken from *A. hombroni* netted from Nursery and Gabunan, Rogongon, Iligan City and Kimangkil, Bukidnon. Random amplified polymorphic DNA (RAPD) analysis and agarose gel electrophoresis were used to assess the genetic variability within its population. The random primer used had generated 25 reproducible RAPD markers showing three distinct banding patterns with low polymorphism. Shared or specific fragments were counted and genetic similarity within population was calculated. The similarity coefficient (F) estimation revealed that there were more pairs of individuals with F values equal to 1 (high genetic similarity) and having no F value equal to 0 (low genetic similarity). Results suggested that there is a considerable low genetic diversity that existed within the population of *A. hombroni*, which could be explained by their geographic proximity. Findings of this study are significant most specially in the formulation of conservation strategies for the Mindanao endemic and vulnerable *A. hombroni*. (Author's abstract)

Keywords: Biology, Actenoides hombroni, Genetic variability, PCR, RAPD markers, Similarity coefficient, Rogongon, Iligan City, Mt. Kimangkil, Bukidnon

Asian Journal of Biodiversity, Volume No. Issue No., 156-173 (Filipiniana Analytics) Fil(S) QH75.A1 A85 v.3 2012

0179

Geographic variation in vegetative and flower morphometry among populations of *Lilium* philippinense Baker (liliaceae), an endemic species in the Philippines Balangcod, Teodora D., Cuevas, Virginia C., Balangcod, Kryssa D. Lilium philippinense is an endemic species with a narrow geographic distribution along the southwestern part of the Cordillera Central Range, Luzon, Philippines. Recently, its population is decreasing due to over collection and habitat loss. This study aims to establish if the populations of this species represents a single population. Morphometric analyses of vegetative and floral characteristics were studied in 23 populations of *L. philippinense*. Morphometric features of the vegetative and floral organs were measured from five plants that were randomly collected from each of the 23 populations. Correlation analysis reveals that most morphometric traits are correlated among the 23 populations. This is supported by principal components analysis suggesting that there is morphometric association among the populations. Elevation significantly correlates with corolla diameter. Using analysis of variance with post hoc tests on the four cluster showed that the populations significantly differ only in corolla diameter and leaf length. Generally, statistical analyses suggests that the 23 *L. philippinense* populations are closely associated with each other and probably represent a single population. The variation in leaf width and corolla diameter can be considered as a start of differentiation among the populations possibly implying selection on these two traits. (Author's abstract)

**Keywords:** Biology, Cordillera Central Range, Geographic variation, Morphometry, Luzon, Philippines, Lilium philippinense

Transactions of the National Academy of Science and Technology, Volume No. 34 Issue No. 1, 84 (Filipiniana Analytics) Fil(S) Q149.P5 N25 34/1 2012

#### 0180

## The goby *Trypauchenopsis intermedia* Volz 1903 (Gobiidae) from the Philippines *Bucol, Abner A., Alcala, Ely L., Alcala, Angel C.*

The cryptic Indo-Pacific goby *T. intermedia* Volz 1903 caught from the muddy estuary of Jalaur River in Iloilo, Panay Island is reported for the first time as a new country record for the Philippines. A brief description and a photograph of the only specimen are also presented. (**Author's abstract**)

Keywords: Biology, Trypauchenopsis intermedia, Gobiidae

Philippine Scientist: a scholarly journal for natural and physical sciences and mathematics, Volume No. Issue No., 97-101 (Filipiniana Analytics) Fil(S) Q1 J95 v.49 2012

#### 0181

#### Histo-physiological development in the gestation of the male seahorse, *Hippocampus comes* Cantor 1850 *Oconer, Edna P.*

Gravid and non-gravid male seahorses were compared morphologically and histologically for the structural difference of the internal brood pouch and embryo development. Paraffin sections were prepared to examine the histological profile of the pouch during distinct stages of gestation. Histophysiological results confirmed the presence of gradually thickening epithelial lining and multilayered crevices to support and protect the developing embryos. Development of glandular tissues observed at

mid-gestation is believed to secrete specific hormones to nourish the developing embryos. Prior to attaining the near-term stage, the yolk was fully resorbed and a complete form of the embryo was noted to lie in quiescent awaiting its parturition. Sign of active spermatogenesis was noted during gestation. (Author's abstract)

**Keywords:** Biology, Brood pouch, Crevices, Male gestation, Spermatogenesis, Traditional Chinese Medicine, Seahorse embryogenesis

MSU Research Journal, Volume No. 4 Issue No. 2, 12-22 (Filipiniana Analytics) Fil(S) Q179.9 M66 4/2 2002

0182

#### Identification of bacteria isolated from standing and dripping water of Bulalon Cave, Burdeos, Polillo Islands, Quezon Province Pulido, Marian A., Baldovino, Manuel M.

Cave microbiology and its possible contribution to microbial diversity in the Philippines have not been given favorable attention at present and are almost neglected. It has been recognized that microbial contribution to cave ecology, mineral formation and ecosystem bioenergetics are some of the salient information that might be drawn from the taxonomic studies of microbial communities specifically from caves in the Philippines. Hence, preliminary assessment on the bacterial diversity of caves in the Philippines was conducted based on the samples collected from Bulalon Cave in the Municipality of Burdeos, Polillo Island, Quezon Province. Standing water from streams and underwater passages as well as dripping water were collected and analyzed following standard collection and isolation procedures. Representative bacterial isolates were then purified and characterized using the conventional methods. Cultural, morphological, physiological and biochemical tests revealed significant presence of *Escherichia coli, Salmonella* sp. and *Pseudomonas* sp. Furthermore, results suggest that the water inside the cave is highly contaminated with these microorganisms, either indigenous (resident) or transient from fecal wastes of common cave inhabitants, bats and birds, as well as those of human origin. Though they are common water-borne bacteria, their growth and adaptation in a subterranean environment of extreme and/or near-starvation conditions are indeed interesting facets of microbial diversity. Thus, characterization of bacterial strains is currently being further performed to explore taxonomic and biotechnological significance. (Author's abstract)

**Keywords:** Cave microbiology, Biology, Bacterial diversity, Standing and dripping water, Resident and transient microorganisms, Subterranean environment

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 62 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0183

#### Identification of ribosome-inactivating protein (RIP) in selected plants for medicinal plant properties screening Panes, Vivian A., Corpuz, Maricel, Uy, Abigail Loren T., Tan Gana, Neil H.

Ribosomal-inactivating proteins (RIPs) are proteins that are generally found only in the leaves, seeds and latex of some plants. These proteins naturally function as part of the defense mechanism of plants against predators like

bacteria, viruses and insects. These proteins have the ability to inactivate the ribosomes of such predators, hence, disrupting protein synthesis. As such, ribosomal inactivating proteins (RIPs) exhibit antiviral, antibacterial, antifungal as well as antitumour activities. These proteins are important in the field of medicine, particularly in the production of drugs against various pathogens.

This present study aimed to isolate RIPs from the seeds of Cucurbitaceae plants including *Cucumis melo* (melon), *Cucumis sativus* (cucumber), *Luffa acutangula* (patola) and *Cucurbita maxima* (squash). Protein extracts were then analyzed using SDS-PAGE. Results of the SDSPAGE analysis showed that nearly all of the plant species had at least a protein that is close to the molecular weight of known, documented RIPs from the same plant family. *Cucumis melo* and *Luffa acutangula* both had protein bands at 25 kDa close to the 26 kDa molecular weight of pepocin;

*Cucumis sativus* has a 30 kDa band similar in weight with a novel RIP found in *Cucurbita moschata; Cucurbita maxima* had a protein band with a molecular weight of29 kDa which has the same molecular weight with TAP-29 RIP. On the other hand, two RIP genes (*Curcin 1* and *Curcin 2*) were identified through PCR analysis using four gene specific primers among plants of the genus *Jatropha* (*J curcas, J podagrica* and *J pandorifolia*) of the family Euphorbiaceae. Another plant species (*Acalypha hispida* L.) also of the family Euphorbiaceae was also found to have the *Curcin 1* gene. Cloning experiments for the confirmation of the candidate Curcin genes will be further pursued. (Author's abstract)

Keywords: Biology, Genes, Proteins, Defense, Cucurbitaceous, Euphorbiaceous

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 84 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

## *In vivo* toxicology assessment of sytematically introduced functionalized nanoparticles in mice

#### Palmes-Saloma, Cynthia P., Ababon, Myka Francesca R.

The last few years have seen the emergence of various applications of nanomaterials in the field of biomedicine. Fluorescent semiconductor nanocrystals, or quantum dots (QDs), have proven to be extremely useful as fluorescent tags for quantitative imaging and detection. Recently, quantum dots with targeting and imaging functionalities have been used in the study of drug delivery and therapeutics. On the other hand, single-walled carbon nanotubes (SWCNTs) are members of the fullerene family of carbon which are composed of carbon atoms arranged in a single sheet of benzene rings rolled up into a tubular form. Carbon nanotubes possess unique optical, electronic, and physicochemical properties that make them useful in a diverse number of applications in different fields, including therapeutics and diagnostics in the biomedical field. Studies have been conducted exploring the use of nanotubes as sensors for detection of mutations and other molecular abnormalities, as scaffolds for tissue regenerationn, and as delivery systems for a wide range of diagnostic and therapeutic agents such as peptides, DNA, and various drugs. However, before any clinical trials can be undertaken to test these nanomaterials in various biomedical applications, their toxicological and pharmacological profiles will have to be studied completely to assess the safety of their use for therapy. We evaluated the possible toxicological effects of QDs and SWCNTs to be used for biomedical applications through systemic introduction of the nanomaterials into mice via tail vein injection. Morphological analysis of various organs, especially those of the reticuloendothelial system (RES), showed no apparent abnormalities 24 hours after introduction of the nanomaterials. Furthermore, no nanomaterials were observed in the brain, indicating that they were unable to cross the blood-brain barrier. The survival and embryonic development of systemically exposed embryos were also similar to the controls. Our results indicate that, at least for the time points observed, there were no adverse effects of the introduction of nanomaterials via the systemic route in mice, showing promise for future therapeutic applications. (Author's abstract)

Keywords: Biology, Nanoparticles, Quantum dots, Single-walled carbon nanotubes, Mouse embryos

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 106-107 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

# Induction of somatic embryo from cotyledonary tissues of cashew (*Anacardium occidentale* L.) by in vitro culture

Lumeran, Belen T., Daulog, Sayrha Pamela M., Uban, Rechelle G.

Cotyledonary explant of cashew (*Anacardium occidentale* L) is used for the induction of somatic embryo using solid and semi-solid Knudson C medium with varying concentrations of benzylodenine (BA) and naphthalene acetic acid (NAA). The following treatments were used: TO (Knudson C only). T1(Knudson c + 0.5 mg/L, BA + 0.5 mg/L NAA), T2 (Knudson C + 1.0 mg/1 BA + 1.0 mg/L NAA) and T3 (Knudson C + 2.0 mg/L BA 2.0 mg/L NAA). Somatic embryo developed 7 days from inoculation. Results showed that a higher concentration of BA and NAA (2.0 mg/L) enhanced somatic embryo were induced by a little lower concentration (1.0 mg/L). Treatment 3 (2.0 mg/L BA and .NAA) is considered the best treatment concentration to induce the development of somatic embryo (80.0%)

solid Knudson C medium while Treatment 2 (10 mg/L BA and .NAA) for semi-solid medium (60%). Furthermore, solid medium showed to be the best concentration of medium for the induction of somatic embryo for this particular plant. (Author's abstract)

Keywords: Biology, Somatic embryo, Cotyledonary explant, Anacardium occidentale

MSU Research Journal, Volume No. 4 Issue No. 2, 23-29 (Filipiniana Analytics) Fil(S) Q179.9 M66 4/2 2002

0186

#### An interactive identification key: the philippine derbidae project Yap, Sheryl A., Bourgoin, Thierry

Identification is the process of finding unknown organism to which an organisms belongs. There are several methods that are available for aiding this process. The most common is the use of a conventional paper-based identification keys - a tedious and time consuming work. The other one is with the help of a computer-aided identification keys - with more options, support back-tracking, provide pictures of excluded species as well as of those that are still under consideration, and provides drawings or pictures of characters or body parts that is/are being described (Yap and Froese, 2005).

With about 160 genera and 1500 species, Derbidae represents the third larger family of the Fulgoromorpha (FLOW, 2010). F. Muir (1917) was able to comprehensively collect and study them in the Philippines. He identified and described a total of 39 genera and 98 species based on the large collection of prof. C. F. Baker and his own. Most hemipterist have paid less attention to the derbid fauna of the Philippines, aside from those that are found attacking economically important plants. The high endemicity of the derbids was noted by Muir (1917), and clearly showed that many more species remain to be discovered.

Using Xper2 - an open e-tool to manage descriptive data - we present here the first illustrated computer-aided identification key for the known Philippine derbid genera based on Diagnostical morphological characters. This computer-aided key would facilitate much faster identification of Philippine derbids in the field and would be helpful to those studying derbids with limited access to foreign literature. (Author's abstract)

Keywords: Biology, Derbidae, Computer-aided identification key, Interactive identification key, Identification

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 132 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0187

## Laboratory scale bioremediation of copper containing wastewater from gold smelting using biogenic hydrogen sulfide

#### Trinidad, Lorele C., Migo, Veronica P., Alfafara, Catalino G., Abisado, Rhea G.

The need for an economical, environment friendly and efficient treatment technology for heavy metal contaminated wastewater led to studies on bioremediation technologies. One of the promising agents is the Hydrogen sulfide  $(H_2S)$  producers.

Application of biogenic  $H_2S$  for the bioremediation of  $Cu^{2+}$  - contaminated wastewater from gold smelting showed a 99.94 % removal of  $Cu^{2+}$  and recovery of 0.64 g of Copper sulfide (CuS). The concentration of  $Cu^{2+}$  was reduced from 1434 ppm to 0.885 ppm based on the analysis of Spectroquant NOVA 60. Parameters that were used include incubation of the sulfate reducing bacterial culture for three days at 36°C, use of 1875 mL Sulfate Reducing Medium (SRM), Nz sparging of the bacterial culture every 2 min (total of10 min) after 2 and 3 days of incubation and use of tubing with an inner diameter of 0.1 em as inlet for  $H_2S$  that will be reacted to  $Cu^{2+}$  in the wastewater and separation of the growth chamber and the precipitation vessel. SRB-21 isolated from sediment samples from Mogpog, Marinduque was used in this study.

Excess H<sub>2</sub>S produced from 1875 mL bacterial culture was able to reduce the concentration of  $Cu^{2+}$  in 100 mL of the wastewater from 1434 ppm to 677 .95 ppm. This corresponds to an additional 53.72%  $Cu^{2+}$  precipitation and recovery of 0.16 g CuS.

This study showed that bioremediation technology based on biogenic  $H_2S$  can clean up industrial wastewater contaminated with  $Cu^{2+}$ , recover  $Cu^{2+}$  in the form of CuS, and the laboratory scale bioreactor system used is an effective treatment system for  $Cu^{2+}$  from wastewater of gold smelting. (Author's abstract)

Keywords: Biology, Biogenic H2S, Bioremediation, Copper, Gold smelting, Sulfate reducing bacteria

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# Larger forms in lophiotoma: four new species described in the Philippines and three from elsewhere in the Indo-Pacific *Olivera, Baldomero M.*

A group of venomous turriform gastropods in the subfamily Turrinae, genus *Lophiotoma*, has been investigated. Previously, forms in this group were identified as either *Lophiotoma unedo* or *Lophiotoma indica*. Our analysis has led to the description of four new species from the Philippines (*L. bisaya, L. friedrichbonhoefferi, L. panglaoensis,* and *L. tayabasensis*) and one each from Australia (*L. capricornica*), South Africa/Mozambique (*L. dickkilburni*), and Madagascar (*L. madagascarensis*). A new subspecies, *L. indica queenslandica*, is also described. In addition, 11 distinctive forms related to these taxa that may or may not deserve separate taxonomic status are defined; these need further evaluation. It is hypothesized that the forms of *Lophioloma* discussed in this report are closely related to a particular subset of *Gemmula*, the *G kieneri/G interpolala* group. (Author's abstract)

Keywords: Biology, Toxoglossate mollusc, Venomous snail, Turridae, Lophiotoma, Shell morphology, Conacea

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 1, 1-28 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/1 2004

0189

#### Lemon grass (Cymbopogon citratus)extract: a promising antibacterial juice Magpantay, Ruth Berry O., Diaz, Marie Manuelle C., Torino, Hanna Nikka L., Cabiscuelas, Maria Evelyne S., Zulaybar, Teofila O.

The antibacterial property of lemon grass (*Cymbopogon citratus*) crude extract in formulated juice was determined in this study. Lemon grass is widely grown in some parts of Asia (Malaysia, Thailand, Philippines, etc.). It is known to have useful properties such as antiseptic and antifungal. It also contains citral and antimutagenic (Mycecerene) components. Thus, lemon grass was used in this study as an additive in the formulation of a juice drink which may benefit people because of its antibacterial value.

The antibacterial activity was analyzed using the paper disc assay method. The two test organisms used were *Staphylococcus aureus* and *Escherichia coli*. Kanamycin monosulfate was used as positive control and sterile water as negative control.

Results showed that the crude extract of lemon grass was less effective in inhibiting the growth of *S. aureus* and *E. coli* as compared to the positive control. However, when formulated into juice, lemon grass extract was found to be more effective than the kanamycin sulfate in inhibiting the growth of the two test organisms. The sensory evaluation test showed that the concentrations 20g lemon grass:200ml water and 20g lemon grass:400 ml water with honey and calamansi are the most acceptable. However, the concentration of 20g lemon grass:400 ml water with honey and calamansi is more acceptable in terms of color.

The data support the hypothesis of this study that lemon grass crude extract has antibacterial activity against *S. aureus* and *E. coli* which can be used in the formulation of lemon grass juice with antibacterial value. (Author's abstract)

Keywords: Biology, Cymbopogon citrates, Staphylococcus aureus, Escherichia coli, Kanamycin, Antibacterial

# Lipid peroxidation and patterns of cadmium and lead accumulation in the vital organs of suckermouth armored catfish *Pterygoplichthys pardalis* castelnau from Marikina River *Jumawan, Joycelyn C., Salunga, Thucydides L., Catap, Elena S.*

Lipid peroxidation and the patterns of cadmium (Cd) and lead (Pb) accumulation in the gills, liver, gut and muscles of *Pterygoplichthys pardalis* from four sites of Marikina River were analyzed to study effects of possible metal toxicity alongside stress response. Mean Cd concentrations from all tissues studied are within permissible amounts (0.02-0.05 mg/L). Mean Pb concentrations from the muscles, gills and gut were within permissible amounts except for the liver (0.22 mg/L). Lipid peroxidation, indicative of oxidative stress was highest in the spleen, followed by the liver and gills among fish samples. Lipid peroxidation values were not correlated with Pb and Cd concentrations in fish samples and were not site-significant which suggest that other possible factors might have also contributed to such stress aside from the Pb and Cd determined in the study. Morphologic and histological observations of gills, gut and liver show general health for this invasive pollution tolerant species, confirming several adjustments and adaptations towards air-breathing, though minute pathologic changes were seen in the liver and gills. This study is the first to assess the patterns of metal accumulation in this invasive species under field conditions in relation to oxidative stress. Further studies using specific biomarkers of metal accumulation and oxidative stress are necessary to support the novel results of this study in *P. pardalis*. (Author's abstract)

**Keywords:** Biology, Lipid peroxidation, Pb and Cd bioaccumulation, Janitor fish, Pterygoplichthys pardalis, Oxidative stress

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0191

#### Local Vibrio isolates exhibit molecular characteristics distinct from reference V. harveyi and V. campbellii strains

#### Cortado, Hanna H., San Luis, Boris B., dela Peña, Leobert, Monsalud, Rosario G., Hedreyda, Cynthia T.

Six Vibrio isolates identified biochemically as Vibrio campbellii from Southeast Asian Fisheries Development Center (SEAFDEC) in Tigbauan, Iloilo, were characterized by 16 rDNA sequence, total protein profile, and DNA profile analyses. Genomic DNA from the isolates were subjected to PCR using four sets of primers targeting gene fragments of hemolysin and toxR based on sequences from reference Vibrio harveyi (IFO 15634), V. campbellii (IFO 1563). isolates identified and local as V. harvevi. Total protein profile could not distinguish the isolates from one another and from the reference V. harveyi (IFO 15634) and V. campbellii (IFO 15631). Analysis of 16s rDNA sequences revealed high degree of sequence similarity (96% -99%) of the six local isolates with other Vibrio species including V. campbellii and V. parahaemolyticus, indicating that this analysis will not be useful in resolving their identity. All six isolates exhibited characteristic reference V. harveyi PCR profile when a primer set designed to amplify a 308-bp fragment of hemolysin gene in that species was used. However, no amplicons were generated for these isolates using primers that amplify toxR gene fragments in V. harveyi. This suggests that the six isolates were not bonafide V. harveyi strains. The isolates also did not exhibit V. campbellii characteristics since the primer designed to target the toxR gene in V. campbellii could not amplify DNA from any of the

six isolates, suggesting that they were not bonafide V. campbellii strains either. The toxR gene from the six isolates could be amplified using a primer based on toxR gene sequences from a SEAFDEC isolate previously identified as V. harveyi (PN-980 I). These data suggest that the six isolates previously identified as V. campbellii as well as PNseparate 980 Ι mav be classified in one group from bonafide reference V. harvevi and reference V. campbellii strains, based on the identical results in the molecular analyses performed in this study. (Author's abstract)

Keywords: Biology, Vibrio, toxR, Hemolysin, Protein profile, PCR

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 17 Issue No. 1, 23-30 (Filipiniana Analytics) Fil(S) Q1.A3 S4 17/1 2005

0192

#### Management of Vibrio infections in fishery industry by antibiotic susceptibility profiling Bautista, Jing R., Gayanelo, Phoebe Jean B., Lahoylahoy, Lucilyn D.

*Vibrio* causes the most diseases and infections in the tropical fishery industry which has led to significant mortality in fishery culture. Despite employment of several chemical treatments and sanitary procedures, *Vibrio* infections still prevail indicating the ineffectiveness of the methods used or the possible development of antibiotic resistance of *Vibrio* strains. This study determines the antibiotic susceptibility profile of *Vibrio* isolates from *Peneaus monodon* (Tiger prawn) and *Selar boops* (Oxeye scad) against common broad-spectrum antibiotics. *Vibrio* strains were isolated from external body surface and intestinal content of tiger prawn and oxeye scad and were grown on Thiosulfate Citrate Bile Salts Sucrose Agar (TCBS Agar), a selective and differential medium for isolation of *Vibrio*. Phenotypic profiles of the isolates were determined by employing the Kirby-Bauer disc diffusion method. All *Vibrio* strains isolated from tiger prawn and oxeye scad were resistant to chloramphenicol and conversely susceptible

streptomycin and erythromycin. The emergence of chloramphenicol resistant *Vibrio* strains indicates the need for constant monitoring of microbial profiles in local fisheries as well as establishment of guidelines regarding methods being employed in eradicating infections in the fishery industry. (Author's abstract)

Keywords: Biology, Vibrio, Peneaus monodon, Selar boops, Antibiotic susceptibility profiles

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0193

## Mandibular shape variation in the ants *Diacamma rugosum* and *Pheidologeton diversus* philippinus

#### Manting, Muhmin Michael E., Tañedo, Jr., Eugene Vernon V., Torres, Mark Anthony J., Demonyo, Cesar G.

This study was conducted to determine mandibular shape variation in two species of ants that vary in their life history and social adaptation patterns. These includes the ant *Diacamma rugosom* which still retains the primitive faculties as solitary hunter and the ant Pheidologeton diversus which lives in a caste system complete with a quen and various type of workers. The specimens used in this study were collected from Initao National Park, Initao,

Misamis Oriental and stored in 70% ethyl alcohol solution. Body size measurements of each worker were taken. The mandibles of the ants were dissected from 150 randomly selected worker ants and photographed prior to Geometric Morphometric analyses. A total of 100 points were digitized from images of the mandibles using TpsDig ver. 2.12. The X and Y coordinates of the outline points were saved in Matlab format and were subjected to Relative Warp Analysis to remove non-shape components. Results showed that size-dependent shape variation was observable only in the eusocial ant *P. diversus* and not in the solitary species *D. rugosum*. Plots of the effective principal components for *P. diversus* showed that forty-seven percent of the shape variation could be attributed to allometry and that minor workers have slender sharp mandibles while the major workers and soldiers have thicker and more robust club. Pearson correlation values for shape variables against body size in *D. rugosom* ranged only from r=0.006 to 0.197. These results show that age- and size- related changes in the shapes of the mandible may accompany task partitioning in ants and may be important in studying the evolution of sociogenesis in ants. (Author's abstract)

Keywords: Biology, Eusocial ants, Diacamma rugosom, Pheidologeton diversus, Solitary ant, Mandible

#### Marine fungi from Kappaphycus Alvarezii and K. Striatum: potential causative agents of iceice disease in farmed seaweeds Solis, Michael Jay L., dela Cruz, Thomas Edison E.

Farmed seaweeds have been infected by ice-ice disease for over 30 years and have resulted to severe production and revenue losses. Previous studies showed the occurrence of the disease following infection of pathogenic marine bacteria and environmental stress. No studies, however, relate the disease with marine fungi. Our research study then aims to isolate and characterize marine fungi from healthy and *ice-ice*-infected Kappaphycus species and asses their ability to induce the disease. Two species of Kappaphycus, K. alvarezii and K. striatum (green and orange varieties), were collected from Calatagan, Batangas. Following washing with sterile artificial seawater and cultivation of collected algae on the culture media Malt Extract Agar (MEAS) and Potato Carrot Agar (PCAS) supplemented with 33 g/L marine salts, 18 morphospecies of marine-derived fungi (MDF) were isolated. Highest fungal diversity ( $H_8 = 2.4$ ) were then observed on infected than in healthy seaweeds. Among the Kappaphycus species, K striatum (orange variety) had the highest incidence of MDF with 67 fungal isolates while K striatum (green variety) had the lowest incidence with only 17 fungal strains. Most MDF isolates grew better in the presence of marine salts. The ability of the isolated marine fungi to produce carrageenolytic and cellulolytic enzymes and to utilize various components of red algae was also tested. Results showed that three and ten MDF isolates exhibited carrageenolytic and cellulolytic activity, respectively. Most isolates utilized different algal substrates, i.e. carrageenan. agar, and cellulose, but highest fungal biomass was obtained from several isolates grown in carrageenan. Among the ten fungal isolates assayed for their ability to induce "ice-ice" disease, infection with 3 MDFs (I, P, and F) produced iceice symptoms (thallus bleaching) in healthy, non-axenic cultures of K. alvarezii. Thus, marine-derived fungi may

play a role in the induction of the *ice-ice* disease in nature. (Author's abstract)

Keywords: Biology, Marine-derived fungi,, Ice-ice disease, Pathogenicity, Seaweeds, Kappaphycus sp.

Transactions of the National Academy of Science and Technology, Volume No. 34 Issue No. 1, 85 (Filipiniana Analytics) Fil(S) Q149.P5 N25 34/1 2012
Panisan, Alfie C., Sta. Isabel, Jamie Anne O., Valles, Brigette Anne C., Zarate, Jocelyn T.

The present worsening global health situation calls for healthier functional foods. This study was done to check for the possibility and acceptability of producing nutrient enhanced cookies through the incorporation of leaves of malungay, saluyot, kulitis, sili and kamote, referred to as MaSaKuSiKam puree. Results showed that five percent (5%)

of MaSaKuSiKam puree incorporation on the flour mixture was slightly preferred over the ten percent (10%) formulation. Variations in flavor were done through the incorporation of other ingredients. Thus cookies were prepared that were: 1) pure herbed (control), 2) herbed-chocolate chip flavored, and 3) herbed-carrot flavored cookies. Sensory evaluation was undertaken in terms of taste, odor, color intensity, mouth feel and general acceptability and compared with just plain (unammended cookies). Proximate analysis of crude protein and crude elemental fiber well as as analysis of iron and calcium content were done.

Statistical analysis showed no significant differences in all sensory attributes of the plain and herbed cookies. This means that herbed cookies were accepted similarly as the plain cookies by the participants/tasters. Higher nutrient contents of the herbed cookies made them more nutritious compared to the plain cookies. Procedures on the preparation of the cookies will be elaborated. It is recommended that studies on the incorporation of MaSakuSiKam puree to other food products be done. (Author's abstract)

Keywords: Biology, Cookies, Herbed cookies, Malungay, Saluyot, Kulitis

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 79-80 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0196

#### Microbial load assessment of some "one town one product (otap)" food products of Ilocos Norte

Franco, Prima Fe R., Acosta, Rowena D., Acebedo, Fairie Ann , Franco, Samuel S., Pascual, Carlos M.

This study was conducted to pre-assess the OTOP food products to be packed by the collaborative mobile packaging project of NEDA-DBP-MMSU. This endeavor ensures safety of consumers and creates benchmark information on the initial microbial load and shelf life of the OTOP food products.

Microbial load assessment was conducted for the following OTOP food products of Ilocos Norte: Chichacorn, Longganisa and Bagnet. Chichacorn samples from 8 famous manufactures in Paoay were considered. Bagnet Samples from 6 producers from Batac were studied and Longganisa samples obtained from 6 entrepreneurs in Batac were obtained. The samples were inoculated in Nutrient Broth and plated in Nutrient Agar. The Total Plate Count for each sample was counted. Results show that initial readings were above acceptable readings. Results of this study relayed to the manufacturers led to better measures employed in handling and preparation of their products thus lessening microbial load. (Author's abstract)

Keywords: Biology, One town one product, Microbial load, Total plate count, Food products

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 68 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

### Modularity and integration in the forewing of the Philippine rice black bug (Scotinophara SPP. stål, hemiptera: pentatomidae)

Manting, Muhmin Michael E., Torres, Mark Anthony J., Barrion, Adelina A., Demayo, Cesar G.

To determine how many modules define the shape of the forewings of Philippine Rice Black Bug (Scotinophara spp. **Stål**), the shapes of the forewing were summarized via Procrustes analysis of a total of 150 landmarks where 10 a priori models of variational modularity in the GM forewing data were tested using the  $\gamma^*$  (Gamma\*) test for goodness of fit (GoF) statistic by comparing the observed and expected covariance matrices. Jackknife support values for each model were also computed using  $\gamma^*$  as the GoF statistic. The analysis was implemented based on a total of 1000 replicates, dropping 10% of the specimens per jackknife replicate, and computing 95% confidence intervals for the statistic. Results showed that the forewing of RBB is spatially organized into two modules, the corium and the clavus - membrane. It can be concluded from this study that these two modules are mutually integrated but statistically independent from each other. (Author's abstract)

Keywords: Biology, RBB, Modularity, Integration, Geomatic morphometrics

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 91 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### 0198

#### Molecular cloning of cysteine protease inhibitors from four endemic Philippine plants Revelo, Renamar N., San Juan, Mari Des J., So, Ruby Haizeline S., Tan Gana, Neil H.

In the recent years, plant based cysteine protease inhibitors (CPIs) have found novel uses in the biomedical sciences such as antiviral, neurodegenerative suppressor, and anti-tumor activities. Though studies have been extensive on several plant families like Brassicaceae, Cucurbitaceae and, however, the studies on endemic Philippine plants are rare. Four endemic Philippine plants, namely: *Lycopodium cernuum* (Lamon-babae), *Trichosanthes cucumerina* Linn. (Melon-melonan), *Quisqualis indica* (Niyog-niyogan) and *Triumfetta bartramia* Linn. (Kulutkulutan) were investigated for CPIs. Three sets of specific polymerase chain reaction (PCR) nucleotide primers representing CPI sub-families were designed from Genbank published sequences and were used to isolate CP I nucleotides from the genomic DNA of the listed endemic plants. PCR amplicons of several sizes were isolated from L. cernuum, 600 and 1,500 bp; T. cucumerina, 750 bp; Q. indica, 450 bp; and T. bartramia, 450 and 750 bp. The amplicons were cloned into pGEM T Easy vector and were submitted for nucleotide sequencing. The results established the first report on the presence of CPI nucleotide fragments among the tested plants species. (Author's abstract)

**Keywords:** Biology, Cysteine protease inhibitors, Polymerase chain reaction (PCR), Lycopodium,, Tichocanthes, Quiscalis, Triumfetta

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#### Molecular investigation of cyclotides in *Rubiaceae* and *Cucurbitaceae Lim, Herb Ralston, Pareja, Andre Joseph, Tan Gana, Neil H., Chan, Merab A.*

Cyclotides are small disulfide-rich peptides that form unique cyclic structures and have a range of interesting biological activities including anti-human immunodeficiency virus (HIV) and neurotensin inhibition, antimicrobial activity and insecticidal activity. Extensive studies have been conducted in the plant family Violaceae, but remains limited for other related plant families from the tropics.

The five hundred eight peptide sequences of known cyclotides were sub-grouped into the four major cyclotide families (circulin A, kalata B1, cycloviolacin 01 and palicourein) and back-translated using the VectorNTI 10 software to generate the consensus sequence for the synthesis of representative polymerase chain reaction (PCR) primers. The genomic DNAs were isolated from selected species belonging to the families Rubiaceae and Cucurbitaceae. The PCR of ampalaya (*Momordica charantia*), gardenia (*Gardenia pseudosidium*) and squash (*Cucurbita maxima*) were able to yield amplicons from 80 to 200 bp, the typical size range of a putative cyclotides. The amplicons were cloned into pGEM T Easy vector and were submitted for nucleotide sequencing. Pattern matching of the nucleotide sequences revealed putative cyclotides similar to the Kalata B1 family. (Author's abstract)

Keywords: Biology, Cyclotides, Circulin A, Kalata B1, Cycloviolacin 01, Palicourein, Rubiaceae, Cucurbitaceae

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0200

#### Morphological differences in the shapes and venation of wings of selected dragonfly species Torres, Mark Anthony J., Gutierrez, Jr., Pedro M., Demayo, Cesar G.

Dragonflies (Odonata) are one of the most ancient and instantly recognizable groups of insects. They were originally classified in the *Libellula* within the Neuroptera. Classical dragonfly taxonomy is often based upon the venation of the wings. This study was conducted to analyze the morphological disparity in the wing shape and venation of five different dragonfly species namely: *Pantala flavescens, Aerthriamanta brepennis, Libellula incestra, Libellula croceipennis,* and *Gomphus externus* using Thin-Plate Spline (TPS) coupled with Correlation Analysis based on distances (CORIANDIS). These were done for triangle, anal loop and outline shapes of the left and right forewings and hindwings of the dragonflies. Results showed that the locations of the species in the "compromise" space reflect a high similarity between *Aethriamanta brepennis* and *Libelluta incestra* however; *Pantalaflavescens, Libellula croceipennis* and *Gomphus externus* show disparity with each other. Furthermore, there is congruence of anal loops (left forewings and right forewings) characters in *Pantala flavescens* and the triangle left forewing and anal loop right forewing in *Libellula croceipennis*. Stacked bar graphs also showed that *Pantala flavescens* departs considerably from other species, which seems to be largely a function of disparity of triangle left and right forewing characters. *Libelluta incestra* and *Libellula croceipennis* show close similarity of outline left hind wing. The high similarity of the character is maybe due to the fact that these two different species belong to the

same genus. Aethriamanta brepennis and Libellula croceipennis also indicate close similarity of outline left hind wing and anal loop right hind wing characters. Gomphus externus indicates high level disparity of outline left hind wing character from other dragonfly species. Results show that Pantala flavescens, Aethriamanta brepennis, Libellula croceipenis and Gomphus externus indicate disparity in their wing characters, although not all of the character differences are so distant. Pantala flavascens demonstrate high level of trait differences compare to the four dragonfly species. However, Aethriamanta brepennis and Libellular croceipennis show close similarity of their morphology. Results of this study suggests that Thin-Plate Spline (TPS) and Correlation Analysis based on distances (CORIANDIS) can be used as a tool for morphological disparity in dragonfly wings. (Author's abstract)

Keywords: Biology, Dragonfly, Wing venation, Morphological differences

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 92-93 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0201

#### Morphometric analysis and DNA barcoding of fruit flies Bactroceraoccipitalis (Bezzi) and B. philippinensis drew and hancock (Diptera: Tephritidae) from Cavite and Davao del Norte

#### Delomen, Michael Leonardo C., Mendioro, Merlyn S., Diaz, Ma. Genaleen Q.

Morphometric analysis and DNA barcoding using the 5' region of the mitochondrial cytochrome c oxidase subunit 1 (mtCOI) gene were carried out to distiguish the fruit flies Bactrocera occipitalis (Bezzi) and B. philippinensis Drew and Hancock. Adult flies and larvae were collected from Cavite and Davao del Norte, Philippines. The larvae were reared to adulthood at the Insect Ecology Laboratory, University of the Philippines Los Baños; adults were then identified along with field-collected adult specimens. Each specimen was assigned with a numerical rating from zero to six through morphological examination, using the diagnostic key originally described by White and Hancock in 1997. For morphometric analysis, ratings zero and six were used for B. occipitalis and B. philippinensis, respectively. The following structures were analyzed: lengths of abdominal tergites/sternites, femora, tibiae, and metatarsals; as well as wing length and width. Morphometric results showed significant differences (via t-test at a=0.05%) in tergite III, mid-femur, and the metatarsals of the  $2^{nd}$  and  $3^{rd}$  leg pairs. For DNA barcoding, genomic DNA was extracted from specimens assigned with every rating (0-2 = B. occipitalis, 3 =intermediate/hybris, 4-6 = B. *philippinensis*). Using customized primers, *mtCOI* was amplified, sequenced, and analyzed. A phylogenetic tree was constructed using the Neighbor Joining method. mtCOI clustering did not support morphological ratings, with B. occipitalis, hybrid, and B. philippinensis samples grouped together. Low bootstrap values at certain branches suggested the lack of phylogenetic differentiation among morphological species delineations. Pairwise distances of consensus sequences ranged from zero to 0.033, which were lower than the standard threshold of 0.5% utilized for species delineation in fruit flies. Therefore DNA barcoding failed to delineate B. occipitalis and B. philippinensis. (Author's abstract)

Keywords: Biology, Dacinae, Mitochondrial cytochrome c oxidase I gene, Neighbor joining, Tephritidae

Philippine Journal of Science, Volume No. 142 Issue No. 1, 69-76 (Filipiniana Analytics) Fil(S) Q1 P55 142/1 2013

#### A new genus and species of stick insect (Phasmatodea: Heteronemiidae: Lonchodinae) from the Philippine Islands Zompro, Oliver, Eusebio, Orlando L.

A new genus and species of stick insect, *Spinophetes spinotergum* Zompro & Eusebio, **gen. et sp. nov.** (Phasmatodea: Heteronemiidae: Lonchodinae) is described and illustrated from the Philippine island of Mindanao, specifically Mount Apo, the Philippines highest peak. These small Lonchodinae show striking development of the abdomen in the female. The new genus seems to be related to *Periphetes Stål*, 1877. (Author's abstract)

Keywords: Lonchodinae, Walking stick, Stick insect, Spinophetes spinotergum n. gen., n.sp, Phasmatodea, Biology

The Philippine Entomologist, Volume No. 14 Issue No. 2, 131-135 (Filipiniana Analytics) Fil(S) QL461 P5 14/2 2000

#### A new genus, two new species and a new subspecies of Philippine Ants (Hymenoptera: Formicidae) Calilung, Maria Vibien J.

Apomyrmex, n. gen., and the following new species and subspecies of Philippine ants respectively are described and illustrated: Apomyrmex manobo, Myrmicaria aphidicola and Strumigenys godeffroyi geococci. Biological notes are also included. (Author's abstract)

Keywords: Biology, Formicidae, Ants, New genus, New species, New subspecies

The Philippine Entomologist, Volume No. 14 Issue No. 1, 65-72 (Filipiniana Analytics) Fil(S) QL461 P5 14/1 2000

0204

#### Occurrence and diversity of myxomycetes (plasmodial slime molds) in Mt. Palay-palay, National Park, Cavite, Philippines

Corpuz, Israel Rhey, Martinez, Czarina Cherizze, Petilla, Kimberly Anne, Baranda, Jaela Nicole, Buaya, Anthony, dela Cruz, Thomas Edison E.

Myxomycetes are fungus-like organisms that are widely distributed in different ecological niches. This study look into the occurrence and diversity of myxomycetes in Mt. Palaypalay National Park in Cavite Province, Philippines. A total of 228 moist chambers were prepared from aerial and ground leaf litter, and twigs. Thirty one species of myxomycetes belonging to 11genera were collected from the field and moist chambers. These were identified as Arcyria cinerea, A. denudata, Collaria arcyrionema, Diderma effusum, D. hemisphericum, Didymium iridis, D. megalosporum, D. nigripes, D. squamulosum, Hemitrichia calyculata, H. serpula, Lamproderma scintillans, Perichaena pedata, Physarum bivalve, P. compressum, P. echinosporum, P. globuriferum, P. oblatum, P. roseum, P. viride, and Stemonitis fusca. Highest myxomycete yield was observed in aerialleaflitter. In terms of taxonomic

twigs showed the highest diversity followed by ground and aerial leaf litter. Highest species diversity and richness

were also observed in twigs while evenness was noted in ground leaf litter. Similarities of myxomycete assemblages were low between the three substrata. This research study is the first report of myxomycetes in Mt. Palay-palay National Park, Cavite, Philippines. (Author's abstract)

Keywords: Biology, Slime molds, Lowland forest, Species abundance, Species distribution, Taxonomy

Acta Manilana, Volume No. Issue No. , 57-65 (Filipiniana Analytics) Fil(S) Q181 A81 v.60 2012

0205

#### Occurrence of corticolous myxomycetes from acacia trees (Samanea samans Merr) collected from different sites in Luzon Island, Philippines Dagamac, Nikki Heherson A., Leontyev, Dmitry V., dela Cruz, Thomas Edison E.

Annually, the Philippines' deforestation rate is computed to be 1.4 % or about 89,000 hectares lost per year. This necessitates urgent assessment of the country's biodiversity. Moreover, the microbial flora in the Philippines is poorly documented. One of the less studied microflora are the myxomycetes. Myxomycetes thrive mainly in decaying substrates like litters, dungs, twigs and barks. Our research study then explores dead barks of living acacia trees from different sites in Luzon as microhabitat for myxomycete assemblages. Acacia trees are one of the most commonly grown trees in the country and thus, may harbour unique species of myxomycetes. Dead barks of living trees (5 trees per site) were then collected from the Northern Luzon Area (Sison, Alaminos, Anda and Mangataren in Pangasinan, Zambales, Isabela), Central Luzon Area (Subic, Nueva Vizcaya, Paniqui, Capaz, Tarlac, and Mt. Arayat, Pampanga), Southern Luzon Area (Los Banos in Laguna, Tagaytay City, Batangas, Daet in Camarines Norte, Goa in Camarines Sur), and from three sites in the Metro Manila Area (Ouezon City, Manila). Moist chambers (300) were set up for each of the collected samples (in triplicates) and were used to assess myxomycete diversity. Following incubation at room temperature for 8 weeks, substrates with plasmodia and/or fruiting bodies were observed. Preliminary results showed that eighty of the total moist chamber set-ups had corticolous myxomycetes. The percent myxomycete yield was low for the bark substrates, i.e. only 17 % and 8 % exhibited plasmodia and fruiting bodies, respectively. Morphological characterization of the fruiting bodies identified the myxomycetes as belonging to three genera, namely, Physarum, Didymium and Arcyria,. It seems that geographical locations did not influence the number nor kinds of myxomycetes observed on the acacia bark samples. The myxomycetes associated with the acacia trees were not as diverse as expected. (Author's abstract)

Keywords: Biology, Myxomycetes, Biodiversity, Physarum sp., Didymium sp., Arcyria sp., Acacia trees

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 99-100 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0206

Occurrence of SHV and TEM genes in phenotipically screened-positive extended spectrum ß-lactamases (ESBLS) producing organisms isolates from selected tertiary hospitals (2008) Verar, Jr., Wilfredo M., Silvestre, Vivian A., Florento, Leila M., Baltazar, Leilani A., Ritumalta, Mark Noe C., Matias, Ronald R., Tuazon, Alexander O.

Extended Spectrum beta-Iactamases (ESBLs) are a large, rapidly evolving group of plasmid-mediated enzymes that confer resistance to third and fourth generation cephalosporins, in addition to the earlier generation of cephalosporins. These enzymes have been derived from TEM and SHV genes by mutations and are produced by gram-negative bacilli. The presence of ESBLs in these organisms can result in treatment failure if the above mentioned antibiotics are used. There is still paucity of surveillance data regarding ESBLs locally. Laboratory diagnosis is problem for ESBL а detection. Positive screening results must still be verified with a confirmatory test. Molecular methods will identify and characterize the gene type rapidly. The objective of the study is to detect the occurrence of TEM and SHV genes among ESBLs producing organisms isolated from selected tertiary hospitals in Metro Manila (2006-2008). PCR was used to detect the expression of TEM and SHV genes. Klebsiella pneumoniae isolates were mostly positive for SHV gene whereas Escherichia coli isolates were mostly positive for TEM gene. Some organisms were found to be positive for both genes. ESBLs have become as serious problem and therefore implementation of appropriate ESBL detection method is recommended. The information will guide the infection control community in determining how to focus its efforts in reducing the emergence and spread of bacterial resistance. (Author's abstract)

Keywords: Biology, Extended spectrum beta-lactamases, TEM, SHV

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 153 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0207

#### Optimization of fermentation medium for the production of bioactive compound by Streptomyces sp. Papa, Irene A., Zulaybar, Teofila O.

The antimicrobial market is large and had a global sales of US\$ 23 Billion in 1996 (Rossner and Scott, 1996). The *Streptomycetes* produced around 55% of the 12,000 antibiotics known in 1995. Antibiotics can be antibacterial, antifungal or even anti-cancer agents, hence, the need to continue the search for antimicrobial compounds. Fermentation medium plays a significant role in the production of any antimicrobial compound. Components of the medium must enhance growth of the producing organism at the same time yield the highest amount of antimicrobials.

Streptomycete C1 was evaluated for its ability to produce an antimicrobial compound using three fermentation media: yeast malt broth (YMB), Croatian fermentation medium (CFM) and cassava medium (CM) after seven days of incubation with shaking. Three test organisms, namely, Staphylococcus aureus 1823, Escherichia coli1825 and Salmonella sp. were used to evaluate the different media using cup cylinder assay. C1 grown in CFM gave the highest zone of inhibition among the media evaluated in all test organisms: 20.69 mm (S. aureus); 22.26 mm. (E. coli) and 21.79 mm. (Salmonella sp). in all media evaluated. On the other hand, C1 grown in either YMB and CM gave similar zones of inhibition on the three test organisms.

Different concentrations of the cornstarch (10, 3 and 2% w/v) component of CFM were tested to optimize the growth and antimicrobial production of C1. CFM with 3% w/v cornstarch gave the highest production as shown by the larger zone of inhibition against *S. aureus* (22.06 mm.) and *E. coli* (22.58 mm.). The C1 broth extracted with ethyl acetate, evaporated to dryness and dissolved with methanol showed growth inhibition against the three test organisms.

Modified CFM is presently being utilized as production medium for the production of our bioactive compounds against Methicillin Resistant *Staphylococcus aureus* (MRSA). (Author's abstract)

Keywords: Biology, Antimicrobials, Croatian fermentation medium, Cylinder cup assay, MRSA and streptomyces

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 61 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

# Outline analysis of wing shape variations in four species of damselflies collected from a stream and waterfalls in Iligan City *Torres, Mark Anthony J., Udani, Cherry Anne M., Demayo, Cesar G.*

The higher level classification and biosystematics of damselflies (*Zygoptera*) rely on qualitative description of the shapes of the wings and selected wing venational elements, i.e. anal loop, fore- and hind wing triangle and subtriangle. This study was conducted to determine variations in the shapes of the wings and wing venational elements within and between populations of four species of damselflies collected from a stream and waterfalls in Iligan City. The aim of the study is to determine the reliability of these characters in ascertaining species boundaries in odonatans. The characters analyzed include the fore- and hind wing, triangle, subtriangle, and the pterostigma. The shapes of these characters were compared using the method of elliptic Fourier analysis which is used to summarize mathematically the outlines of closed biological contours. A total of three replicates were analyzed per character. Likewise, digitization was done three times to determine measurement error. Tests for significant differences in the shapes of the characters were also done using multivariate methods of analysis such as the Multivariate Analysis of Variance (MANOVA) and Procrustes ANOVA. The results showed that the wing shapes of the four damselfly species differ between sexes and significantly between the two sites. Aside from sexual dimorphism, geographic differentiation could explain the differences considering that damselflies are territorial in nature. The results also show that elliptic Fourier analysis could be used in understanding the diversification of these species of damselflies. **(Author's abstract)** 

Keywords: Biology, Outline analysis, Wing shape, Damselflies

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 93-94 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0209

#### Phenotypic distinction of enterobacterial flora of houseflies (Musca domestica L.) Fanuncio, Lady Jane C., Maguinsay, Carol Socorro, Bautista, Jing R., Lahoylahoy, Lucilyn D.

The synanthropic nature of houseflies (Musca domestica L.) allows them to be closely associated with humans. Their presence in residential and food settings poses a significant health threat to human beings as they are potential vectors of several pathogenic microorganisms. This study investigated the antibiotic resistance profiles of enterococci from houseflies collected in eating establishments around the vicinity of Mindanao State University-Iligan Institute of Technology, Iligan City. Twenty-four presumptively identified Enterococcus sp. isolated from the stomach contents of thirty-eight houseflies were assayed for their antimicrobial resistance making use of the Kirby-Bauer disc diffusion method. Twenty (83%) of the isolates showed phenotypic resistance to erythromycin while non-susceptibility was also exhibited against kanamycin (58%), tetracycline (54%), and chloramphenicol (21%). Ciprofloxacin was the most effective antibiotic having the highest number of susceptible isolates (83%) and thus the least number of resistant strains Eleven isolates exhibited against it. resistance least three antibiotics were characterized multi drugresistant to at and as

*Enterococcus*. The isolation of these antibiotic resistant *Enterococcus* strains from the houseflies suggests that these organisms may play a role in the transmission of antimicrobial-resistant bacteria in the community. Resistance of enterococci to multiple antibiotics leaves few alternatives for disease management as fewer drugs would be available to combat the infection caused by the resistant strain. Detection of these strains would impel constant monitoring of houseflies in the locality to manage the prevalence of enterococcal infections. (Author's abstract)

Keywords: Biology, Houseflies, Kirby-Bauer disc diffusion method, Multi drugresistant Enterococcus

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 52 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0210

#### Philippine social science in the century of biology engaging the biological dimensions of behavioral and social phenomena Bernardo, Allan Benedict I.

My main thesis in the paper is that Philippine social scientists need to engage the biological (i.e., genetic and neurological processes shaped by human evolution) dimensions of behavioral and social phenomenon. In developing this thesis, I first broadly clarify the so-called nature-vs.-nurture debate which pits biological explanations against social and cultural explanations, then proceed to briefly explain contemporary perspectives of evolutionary psychology that recast the nature- vs. -nurture debate. In particular, drawing from examples of recent research and theory, I attempt to show that current theorizing underscores the close interaction between biological and socio-cultural processes, and thus there is no need to construe biological knowledge as antagonistic to socio-cultural theorize. I cite some examples to show how social science theories are improved when biological factors are incorporated in the theories. I then discuss the implications to Philippine social science, and suggest that a small sector of the social science community should explore how the biological dimensions of social and behavioral phenomenon can improve our theorizing. I further suggest that there is a need to re-examine how Philippine social sciencies is engaged in theorizing; and to consider some possible constraints within the social science research process in the country. (Author's abstract)

Keywords: Biology, Behavioral phenomenon, Social phenomena, Nature vs. nature

Transactions of the National Academy of Science and Technology, Volume No. 28 Issue No. 2, 215-226 (Filipiniana Analytics) Fil(S) Q149.P5 N25 28/2 2006

0211

#### Physiological signaling and adaptation processes to drought and salinity stress interactions in rice Cadiz, Nina M., Kwon, Taek-Ryoun

The effects of drought and salinity stresses in plants are being studied extensively at the physiological and molecular levels. However, most studies deal with the single effect of each stress. However, under natural conditions, a single stress factor does not exist; thus this study aimed to address the conditions that will likely

approximate	that	of	the	natural	environment.
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A simple, repeatable system of combined drought and salinity stresses under a managed environment was established. Fully established rice seedlings of Vandana (drought tolerant), Pokkali (salt tolerant), IR-64 (drought sensitive) and IR-29 (salt sensitive) were challenged by drought, salinity and their combination. Physiological traits (e.g. osmotic adjustment, relative water content and growth characters) were used as screening parameters for drought and salinity stress interactions. Among the stresses imposed, the combined interaction of salt and drought stress was the most detrimental to all rice plants irrespective of genotypes. This was confirmed by the high relative water content (RWC %) of the leaf tissues in all cultivars under salinity stress as compared with the RWC of the various cultivars under drought and combined drought plus salinity stresses. The results were further confirmed by the low osmotic concentration of rice cultivars under salinity stress. Although different rice genotypes respond negatively to these abiotic stresses, Vandana (drought tolerant) and Pokkali (salt tolerant) were less affected by the stresses. The system established may be used by molecular biologists to search for novel genes working for both drought and

#### salinity stresses. (Author's abstract)

Keywords: Biology, Salinity, drought, Interaction, Adaptation, Physiological signal

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 71 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0212

#### Phytochemical screening and toxicity of some green leafy vegetables consumed in Batac, Ilocos Norte

#### Domingo, Doreen D., Domingo, Estrelita O., Franco, Prima Fe R., Ramos, Rei Karlo A.

Green leafy vegetables (GLV) such as Ipomea batatas, Ipomea aquatica and Corchorus olitorius are some of the traditionally grown vegetables in Batac, Ilocos Norte. These vegetables have long been consumed as part of the native cuisines of Ilocano culture. GLV have dietary components and phytochemicals like alkaloids, cardenolides, tannins, saponins and flavonoids that play important roles in alleviating certain disorders/age-related diseases. Nonessential or toxic substances can also be present and when accumulated in the body, they give а negative effect leading. The leaf and stem extracts of the GLV were subjected to: (1) phytochemical screening, (2) toxicity assessment considering Lethal Concentration 50 (LC<sub>50</sub>) through Brine Shrimp Toxicity Test (BSTT), and (3) calculation of the acceptable intake of GLV daily (DI) by individuals.

Phytochemical screening revealed that leaf and stem extracts of all the GLV contain alkaloids and cardenolides. Tannins were found present only in *C. olitorious* and *I. aquatica*. Whereas, saponins were found present in *C. olitorious* and flavonoids in *I. batatas*.

BSTT revealed that extracts of *Ipomea batatas* exhibited the highest toxicity against the shrimps (  $LC_{50}$  value **14.79 µg/ml**), compared with *Ipomea aquatica* ( $LC_{50}$  value **52.48 µg/ml**) and *Corchorus olitorius* extract ( $LC_{50}$  value **69.18** µg/ml).

Based on the evaluated toxicity level, the computed acceptable Daily Intake (DI) of these GLV in mg/kg of body weight as reference for the daily diet are as follows: *Ipomea batatas* (36.98 mg/kg of body weight), *Ipomea aquatica* (131.2 mg/kg of body weight) and *Corchorus olitorius* (172.95 mg/kg of body weight).

Hence, the GLV consumed in the City of Batac have alkaloids, cardenolides, tannins, saponins and flavonoids,

two of which have antioxidant property (alkaloids and flavonoids) necessary to reduce the ageing process and cytological degenerative behavior. The exhibited toxicity of GLV extracts against the shrimps can cause acute or chronic toxicities only when consumed in large quantities, thereby, attention to consumption and daily intake must be given to avoid extensive damage to cells and its metabolism. (Author's abstract)

Keywords: Biology, Phytochemical, Toxicity, GLV, LC50, Daily intake

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 78-79 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0213

#### Plant species diversity and endemism at dihang dibang biosphere reserve and its surroundings, eastern himalaya biodiversity hotspot Singh, Tarun P., Singh, Sarnam

An attempt has been made to give assessment of plant species diversity of primary and secondary forest vegetation types in Dihang Dibang Biosphere Reserve (DDBR), a single biosphere reserve in Eastern Himalaya. It is excellent example of continuous unbroken forest of the Himalaya from sub tropics to mountain tundra while surrounding area of southern part cover tropics. In the present study we have analysed seventy three sample plots in different forest types and species diversity indices were calculated, Sharmon-Wiener's H $\phi$  species richness, evenness, dominant species, dominant verses species richness, and important value index of Biosphere. The species richness in Subtropical evergreen II forest was found highest 7.21 with 350 numbers of species. Owing to the variation of microenvironment, diversity values within the same vegetation type vary between the samples from different patches. They study would be a great assistance for biodiversity conservation and planning of newly constructed DDBR and its surroundings. (Author's abstract)

Keywords: Biology, Species diversity, Endemism, Biosphere reserve, Eastern himalaya

Asian Journal of Biodiversity, Volume No. Issue No. , 1-22 (Filipiniana Analytics) Fil(S) QH75.A1 A85 v.3 2012

#### Population structure and reproductive biology of Siganus fuscescens Houttuyn 1782 (Perciformes, Siganidae) in Pujada Bay, Southeastern Mindanao, Philippines Jumawan-Nanual, Bernadette, Metillo, Ephrime B.

The mottled spinefoot rabbitfish, *Siganus fuscescens*, is an important but overfished species in Pujada Bay, Davao Oriental. In this study, body size (weight and standard length), fecundity and gonadosomatic index (GSI) of *S. fuscescens* were determined for a year at three sampling sites in Pujada Bay in order to analyze the population structure and reproductive patterns of the species. Mean standard lengths ranged from 5.5-15.1 cm, significantly much smaller than the expected length at maturity of 20-25 cm. However, relatively larger individuals (11.8-19.7 cm) were found in the less fished site. Length-weight relationship derived growth coefficient b from pooled data indicates isometric growth suggesting a robust bay-wide

*S. fuscescens* population amidst extreme overfishing. Length-frequency histograms indicate that the species attains maximum lengths in the months of September/October and in March. This well-separated bimodal pattern is reflected in peak GSI values implying that associated with maximum body size is gonad maturation during these months. Similar high fecundity during these months confirms that spawning period occurs twice a year from February to April with a peak in March and the other from September to October. The species employs an iteroparous and *r*-selected-opportunistic life history strategy (high reproductive effort, early maturity, multiple spawning), but extreme overfishing for decades may have driven the species to mature much earlier and spawn at a much smaller body size with a much lower fecundity. The less fished site, however, seems to allow individuals to mature at a larger body size and spawn higher number of eggs. Hence, some degree of protection from overfishing may help in the sustainability of populations and fishery of *S. fuscescens* in Pujada Bay. (Author's abstract)

Keywords: Biology, Siganus fuscescen, Spinefoot rabbitfish, Pujada Bay, Fecundity, Gonadosomatic index, Fishery, Resource management

The Philippine Scientist, Volume No. Issue No. , 62-79 (Filipiniana Analytics) Fil(S) Q1 J95 v.45 2008

#### A possible role of peptides in the growth enhancement of an industrial strain of Saccharomyces sp.

Cortes, Dino Paolo A., Domingo, Albert Francis E., Daquinag, Alexes C., Hedreyda, Cynthia T.

Individual addition of a commercially available nutritional supplement and a methanol extract from an industrial *Saccharomyces* sp. strain SMC resulted in the enhanced growth of *Saccharomyces* sp. strain SMC in minimal medium. Isolation of the growth enhancing components from aqueous extracts of the supplement and the cellular extract was performed using reversed-phase, gel filtration, and ion exchange chromatography. Reversed-phase chromatography using Sep-Pak® vac C18 yielded aqueous washes which elicited increased yeast growth. Gel filtration chromatography of the aqueous washes in a group separation mode using Sephadex G25 gave three distinct groups for the nutritional supplement, and four distinct groups for the cellular extract. Fraction groups that exhibited growth enhancing activity also exhibited high absorbances at all three wavelengths of 214, 260, and 280 nm. Two major fractions which tested positive for growth enhancing activity in succeeding experiments were obtained after passing each of the active GFC groups through a Toyopearl SP 550C cation exchanger column. The active component from the cellular extract did not bind to the cation exchanger. The absorbance data at 214 nm (peptide bond

experimental absorbance maximum wavelength), the Bradford assay (showing the presence of proteinaceous matter), and the active component's inclusion in the Sephadex G25 fractionation range of 1-5 kDa (characteristic of small peptides) suggest that the growth enhancing components of the nutritional supplement and methanol cell extracts are peptides. (Author's abstract)

Keywords: Biology, Brewer 's yeast, Peptides, Organic extraction, Chromatography, Bradford assay, Nutritional supplement

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 17 Issue No. 1, 15-22 (Filipiniana Analytics) Fil(S) Q1.A3 S4 17/1 2005

#### Preliminary cytogenetic characterization of the golden birdwing, *Troides rhadamantus* (Lucas) (Lepidoptera: Papilionidae)

#### Ocite, Myla, dela Cruz, Clifford, Reventar, Mary Rachel, Carpena, Nathaniel, Barrion, Adelina, Barrion-Dupo, Aimee Lynn

In order to initially investigate the chromosomes of the golden birdwing, *Troides rhadamantus* (Lucas), a single male specimen was procured from a private butterfly rearing station in Bay, Laguna. Meanwhile, the eggs of this species were collected from host plants in the same butterfly farm through the use of forceps. Following cytogenetic preparation of the male testes as well as the eggs, qualitative observation of the mitotic cells and chromosomes were done. Chromosome counting was carried out through the Image J software application. In addition to this, an interpretative drawing of the chromosomes and a karyogram were constructed from the chromosomes at premetaphase.

Out of the 30 mitotic cells examined, 29 showed 2n = 30 to 39. One mitotic cell had a chromosome number equal to 41. The mode or the most frequent chromosome number was 2n = 30, while the mean and median chromosome numbers were 2n = 32.5 and 2n = 31, respectively. (Author's abstract)

Keywords: Biology, Chromosomes, Golden birdwing, Karyogram, Mitotic cell, Pre-metaphase

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 89 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0217

#### Preliminary screening of methanolic extracts of kalingag (*Cinnamomum mercadoi* Vindal) and Talisay (*Terminalia catappa*) against methicillin resistant Staphylococcus aureus (MRSA)

#### Zulaybar, Teofila O., Papa, Irene A., Edradan, Maria Ruth R., Cruzado, Rhea Mii A., Edradan, Gail Ruth R., Ongluico, Niño Paolo T.

In Surigao del Norte, the native Mamanuas and other barriofolks use Kalingag (Cinnamomum mercadoi Vidal) as medicine to help digestion, aid in flatulence and as an expectorant while Talisay (Terminalia catappa) is used as sudorific and antihelmenthic. The widespread use of these plants in traditional medicine led the researchers to determine its effectivity against methicillin-resistant Staphylococcus aureus (MRSA). The worldwide occurrence of MRSA is one of the most common causes of fatal infections and diseases in hospitals. The drug of last resort is vancomycin. In 2002, the emergence of vancomycin-resistant enterococci and vancomycin-resistant S. aureus is raising serious public health concerns. With the emergence of resistant organisms, it is high time to continue search for novel antibiotics that inhibit pathogens resistant to other antibiotics.

Preliminary screening of methanolic extracts of Kalingag and Talisay leaves by cup cylinder method showed that Talisay can inhibit MRSA (22mm dia.). However, Kalingag extract has lower zone of inhibition (20.70mm) against MRSA which is significantly different than the control antibiotic (Vancomycin, 1,000 ppm) at 24.55mm. Thin layer chromatography showed several spots on Talisay crude extract. Moreover, bioautography plate has an active spot against MRSA.

Findings of this study suggest that Kalingag and Talisay can be a potent source of novel compounds for the treatment of infectious diseases. (Author's abstract)

Keywords: Biology, Kalingag, Talisay, Vancomycin., Methanolic extracts, Bioautography

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 75 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Preliminary taxonomic and image catalogue of copepod species (crustacea, copepoda) from the neritic waters of Northern Mindanao, Philippines *Metillo, Ephrime*

Copepods often dominate zooplankton samples and in the marine pelagic ecosystem they form a critical pivotal role in the transfer of biomass and energy from phytoplankton to fishes. Most neritic tropical copepods are very small (0.1 to 1.5mm average total length) and similar looking rendering them very difficult to identify to species level. Many species have been reared for the aquaculture live feed industry because they contain high levels of DHA, EPA, and AA poly-unsaturated fatty acids (PUFA) ideal for the increased survival of fish larvae. As part of a study aimed at screening for species that are easily reared and PUFA-rich, neritic marine copepods were collected in Iligan Bay and Mindanao Sea, identified to species level, and the whole animal photographed. The pictures and taxonomic information were made into a catalogue which became a very useful guide to quick and easy identification of species. To date, I have photographed 43 common species including: (1) Acartia negligens, (2) Acartia erythraea, (3) Pontella sp., (4) Calanopia elliptica, (5) Calocalanus pavo, (6) Candacia catula, (7) Candacia curta, (8) Candacia discaudata, (9) Canthocalanus pauper, (10) Paracandacia truncata, (11) Centro pages calaninus, (12) Centropages furcatus, (13) Centropages gracilis, (14) Copilia sp., (15) Corycaeus typicus, (16) Corycaeus limbatus, (17.) Corycaeus speciosus, (18) Corycaeus longistylis, (19) Cosmocalanus darwini, (20) Euchaeta manna, (21) Euchaeta media, (22) Euterpina acutifrons, (23) Labidocera acuta, (24) Labidocera pavo, (25) Labidocera minuta, (26) Labidocera detruncata, (27) Macrosetella gracilis, (28) Microsetella disseta, (29) Oithona similis, (30) Oithona plumifera, (31) Oithona rigida, (32) Oncaea venusta, (33) Paracalanus aculeatus, (34) Parvocalanus crassirostris, (35) Pontella surrecta, (36) Pseudodiaptomus philippinensis, (37) Sapphirina sp., (38) Subeucalanus crassus, (39) Temora turbinata, (40) Temora discaudata, (41) Undinula vulgaris, (42) Calanopia thompsoni, and (43) Tortanus discaudatus. In the long term, an electronic database comprising images, taxonomic and ecological information, and genetic barcodes will be built up from this preliminary catalogue. (Author's abstract)

Keywords: Biology, Copepods, Crustacea, Diversity, Image catalogue, Taxonomy

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 95-96 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0219

### Probiotic property of locally-isolated lactic acid bacteria and development of soya based probiotic product

Elegado, Francisco B., Calapardo, Marilou R., Saguibo, Jennifer D., Mercado, Margarita A.

Functional probiotic foods may help prevent food-borne diseases and gut disorders, enhance the immune system and fight colon cancer and heart diseases. This study was done to characterize the probiotic properties of local bacteriocinogenic lactic acid bacteria (LAB) isolates, evaluate their anti-obesity and hypoglycemic effects in mice, and assess a soya milk-based probiotic drink. Acid and bile tolerance tests were done on *Lactobacillus fermentum* 4B1 and *Lb. pentosus* 3G3 in comparison with *Lb. paracasei* IY9, a commercial probiotic isolate. Only 4B1 was able to recover after being exposed to pH 2 artificial gastric juice (AGJ) for 3 hours and transferred to pH 8 simulated intestinal fluid (SIF). However, at pH 3 AGJ, all strains were still viable and recovered in SIF.

Oral administration of the LAB isolates for 14 days showed that the blood glucose levels of mice fed with 4B1 and 3G3 decreased but not with 1Y9. The control group (normal diet) and high fat non-lactobacillus group showed increased blood glucose and body weight, respectively.

A formulation consisting of 150 ml 10% skim milk, 150 ml low sugar soymilk (4% sugar), 7.5 g white sugar, 7.5 g muscovado and 25 ml pineapple syrup, was most acceptable for a proposed probiotic drink on the basis of palatability and probiotic bacterial growth. This formulation was stable for 14 days with 3G3, 1Y9 and *Lb. plantarum* BS but only 2 days for 4B1. Sensory evaluation, in terms of sourness, sweetness, color, appearance and flavor, showed that the drink with BS was most acceptable, but not significantly different (P= 0.05%) from the drinks with 3G3, 4B1 and the uninoculated formulation. On the other hand the drink with 1Y9 was least acceptable and significantly different. The slight beany flavor of the fermented soy milk, though mixed with skim milk, still poses a challenge. (Author's abstract)

Keywords: Biology, Lactobacilli, Probiotic soya milk, Anti-obesity, Hypoglycemic

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 59 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0220

#### **Rediscovering job's tears** *Lingaling, Evangeline B., Lirio, Lorenza G.*

Preparing for quality life? There is money-making leisure out of the different products derivable from the plant which the local folks would name "job's tears, adlay, ag-gey, ag-dey, tigbi, etc." The plant, considered a weed by some farmers when found growing in rice paddies, is scientifically known as *Coix lachryma-jobi* Linn. Belonging to the same family where rice, com, barley, sorghum, belong (i.e. Family Poaceae/Gramineae), *Coix* is known to have a wide array of uses. Through interviews with the local folks who are knowledgeable on job's tears, this study documented several cultivated and wild varieties of *Coix* in three municipalities of Kapangan, Kibungan and Atok in Benguet Province. When the seeds are prepared into food (as when cooked like oatmeal, as tea or even into 'tapey' or rice wine), into ornaments (as when made into earrings, bracelets, necklace, rosaries. or curtains), or as medicine (to cure some ailments like wounds, urinary tract infections, etc.), it is remarkable that *Coix* plant is going to provide a lot of economic opportunities for people, both young and old alike, to prepare for quality life ahead. The study also showed that *Coix* is superior in terms of some essential nutrients and vitamins as compared with rice. Indeed, we may just have a solution at hand to the current rice shortage crisis. Rediscovering such diverse uses also would be inherent for people to protect, conserve biodiversity and propagate the plant because they realize that their livelihood and hence, survival, depend on the plant. (**Author's abstract**)

Keywords: Biology, Poaceae/Gramineae, Job's tears, Ornaments, Rice wine

#### The relationship of shell dimensions and shell volume to live weight and soft tissue weight in the mangrove clam, *Polymesoda erosa* (Solander, 1786) from Northern Australia *Gimin, R., Thinh, L.V., Griffiths, A. D., Mohan, R.*

Shell dimensions (length, height, width) and shell volume were evaluated as estimators of growth for *Polymesoda erosa* in northern Australia. Each parameter was a good estimator when applied to live weight ( $r^2$  values of 76-96 percent), but not to soft tissue weight (wet, dry, or ash-free dry weight) ( $r^2$  values of 13-32 percent). The b value for shell volume to weight relationship of clams collected during the dry season (June to October) was significantly different than for those collected in the wet season (February to April). (Author's abstract)

**Keywords:** Biology, Shell dimensions, Shell volume, Mangrove clam, Polymesoda erosa, Live weight, Soft tissue weight

NAGA, WorldFish Center Quarterly, Volume No. 27 Issue No. 3-4, 32-35 (Filipiniana Analytics) Fil(S) SH1 I81 27/3-4 2004

0222

# Relative warp analysis and correlation analysis based on distances to study morphological variations in the shell shape of *Pomacea canaliculata* (Lamarck) found in Iligan City *Tabugo, Sharon Rose M., Torres, Mark Anthony J., Demayo, Cesar G.*

In terms of analysis of the forms of organisms, landmark-based geometric morphometrics are more preferred nowadays, by many systematists over the so-called traditional morphometrics. In this study, Relative Warp Analysis and Correlation Analysis based on Distances were used to study the existing morphological variations in the shell shape *P. canaliculata* from the three major barangays in Iligan City: Buruun, Tubod, and Mahayahay. Relative warps are factors (principal components of partial warp scores) which themselves summarize the major vectors of shape variation within samples. Correlation Analysis based on distances on the other hand, allows both looking into similarities among specimens/groups, and interpreting such similarities in terms of congruence among traits. It is also a measure of trait disparity. Comparison of samples was done by looking into the relative contributions of shell shape between female samples from Tubod and Mahayahay and male samples from Tubod and Mahayahay. This is based on the three traits being considered. *P. canaliculata* (M)-Buruun departs considerably from other species groups, although this seems to be largely a function of trait #1 (top portion of shell) alone. Results obtained have somehow demonstrated that subtle shape differences in shell shape can be detected by geometric morphometrics. (Author's abstract)

Keywords: Biology, Geometric morphometrics, Relative warp, Shell shape, Trait disparity, Correlation analysis

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 103 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Salinity tolerance of introduced South American sailfin catfishes (Loricariidae: Pterygoplichthys GILL 1858)

#### Brion, Marco Alberto, Guillermo, Jr., Jose Gil, Uy, Cheston, Chavez, Joel, Carandang, IV, Jose Santos

The ecological distribution of species is limited by its physiological tolerances towards natural physical barriers. The experimental  $LC_{50}$  of salinity to an introduced freshwater fish was determined as it implies to its dispersal and distribution. South American sailfin catfishes belong to a freshwater fish family but introduced specimens have been collected in brackish waters of the Pasig River in the Philippines. Tolerance to salinity of this introduced fish could mean increased potential to expand its range into or via marine waters. Juvenile South American sailfin catfishes were purchased from local petshops and were subjected to a 96-hour toxicity test for salinity in the laboratory. Replicated tests using various salinity concentrations were performed. Mortality and survival of test samples were tabulated to determine  $LC_{50}$ . The  $LC_{50}$  of salinity was calculated to be 10.6 g/L. Survival analysis of the data gives an estimate that at 10 g/L concentration over 50% of the samples have strong chance of survival beyond 85 hours of exposure to saline water. *Post mortem identification of samples confirms they belong to genus* Pterygoplichthys. We discuss the implications of the  $LC_{50}$  results on the migration and dispersal of this introduced freshwater fish, and the application of taxonomic data in the study of invasions. (Author's abstract)

Keywords: Biology, Janitor fish, Pasig river, Pterygoplichthys, Salinity tolerance

Philippine Journal of Science, Volume No. 142 Issue No. 1, 13-19 (Filipiniana Analytics) Fil(S) Q1 P55 142/1 2013

0224

#### Sexual dimorphism and morphometric differentiation among colormorphs of the swordtail fish Xiphophorus helleri Torres, Mark Anthony J., Demayo, Cesar G., Gayanelo, Phoebe

Morphological distinction through truss network analysis in fishes has been an effective tool in the study of stock identification, thus improving the biological and systematic basis of management. In this study, the truss networks of three colormorphs of swordtail fish *Xiphophorus helleri* were analyzed using geometric morphometrics. This study aims to present an alternative digitized method to analyze fish truss network morphometric data. Analyses includes Procrustes fitting, thin-plate spline transformation grids, partial and relative warp scores, principal component analysis, discriminant analysis and cluster analysis. The results show distinct variation in body shapes between sexes within the colormorphs (sexual dimorphism) and distinct differences between the colormorphs. Variables that contribute to truss network variation were identified. The success of classification of every individual with respect to the group cases was identified (97.8 % correctly classified and 94.2% cross validated). The results proved the efficiency of geometric morphometric analysis in understanding biological forms in organisms. (Author's abstract)

Keywords: Biology, Sexual dimorphism, Truss network, Procrustes

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 96 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Simple and rapid screening of antimicrobials in feed samples Ramirez, Teresita J., Saguibo, Jennifer D., Sapin, Arsenia B., Sedano, Susan A.

The presence of antimicrobials in animal feeds and its ingredients is of great concern to the animal industry. The development of new microbial strains with antibiotic resistance poses a threat not only to animals but to consumers as well. Hence, a simple and rapid screening of antimicrobials in feed samples adapted from spot-on-lawn antimicrobial assay (U. S. Pharmacopoeia, 1990) was conducted.

Ninety percent (90%) of 30 feed samples tested for antimicrobials against Salmonella typhimurium or Salmonella enteritidis were found positive, while one out of three feed samples tested for antimicrobials against Escherichia coli was found positive. Three different feed samples were found negative for antimicrobials against Candida albicans, Saccharomyces cerevisiae, Aspergillus flavus and Aspergillus parasiticus. It was also found that increasing the moisture content of feeds increased the availability of antimicrobials in the culture medium resulting in greater zone of

Feed samples found to contain antimicrobials based on this simple method were further tested by artificial inoculation with *Salmonella enteritidis* and *Salmonella typhimurium*. Feed sample tested to be free of antimicrobials was used as control. Growth of these pathogens was monitored by cultural method and by PCR-based detection kit developed at BIOTECH. Results from this trial confirmed the preliminary evaluation obtained from the simple spoton-lawn assay method.

With the growing concern of antibiotic resistance in farm animals for food production and antibiotic carry-over in humans, this simple and rapid detection of antimicrobials in feed could facilitate the screening of antimicrobials in feeds before use by the animal industry. (Author's abstract)

**Keywords:** Biology, Antibiotic resistance, Zone of inhibition, Animal feeds, Antimicrobials, Spot-on-Iawn antimicrobial assay

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 63 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0226

#### Site-directed mutagenesis identifies putative soil-binding residues of *Bacillus subtilis* 168 endoglucanase *Cruz, Wilma T., Yun, Han Dae*

The *bglC* gene of *Bacillus subtilis* 168 was cloned. Conserved amino acids that are positively-charged and accessible on the surface of the native *Bacillus subtilis* BglC endoglucanase were substituted with negatively-charged or neutral amino acids by site-directed mutagenesis with the aim of identifying residues in the putative soil binding domain. Lysine residues at positions 38,177, and 249 seem to have significant roles in enzyme binding to soil as suggested by the decreased binding abilities of the mutant proteins. We hypothesize that the localized electrostatic changes due to the amino acid substitutions resulted in the decreased affinity of the protein for the negatively-charged soil surface. Further study is required to elucidate the precise role of each residue and the nature of the protein-soil interaction. (Author's abstract)

*Keywords:* Biology, Bg1C, Endoglucanse, Site-directed mutagenesis, Soil-binding domain, Chemical soils (montmorillonite, kaolinite)

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 56 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Species richness, assessment and conservation of some economically important Philippine lycopods

#### Amoroso, Victor B., Zamora, Prescillano M., Rufila, Lilibeth V.

Lycopods are lower vascular plants with microphyllous leaves and dichotomous branching. Field exploration and herbarium examinations revealed 39 species and 3 genera of Lycopodiaceae. Of these, 2 are endangered, 9 endemic and almost all species of Lycopods are economically important. Specific economic uses and distribution of Lycopods were recorded. Many of these ornamental species collected from the wild are sold exorbitantly in commercial gardens. The forest ecosystem is the best habitat and sources of these Lycopods for collection and propagation. The practice of over-harvesting from the wild has depleted and threatened the population of Lycopods. *Ex-situ* conservation was initiated at Central Mindanao University Fernery to save these economic and threatened species of Lycopods. Using hanging baskets or clay pots with crushed trunk of *Cyathea* and chopped coconut husk, propagation of Lycopods is possible. (Author's abstract)

Keywords: Biology, Species richness, Uses, Conservation, Lycopodiaceae

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 98 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0228

#### Studies on the production and utilization of vermicompost produced with the African Nightcrawler (*Eudrilus eugeniae*) in the Philippines *Guerrero, III, Raphael D., Villegas, Lina G., Guerrero, Luzviminda A.*

*Vermicompost* is the humus produced through the action of earthworms and other soil organisms. Studies were conducted to determine the effects of three stocking densities of the African nightcrawler (*E. eugeniae*) on the production of vermicompost and earthworm biomass, the effects of using vermicompost on the production of eggplant, cauliflower and cabbage, and the effect of vermicompost extract on primary root growth.

in partially shaded outdoor beds *E*. eugeniae was cultured (1.5 x 1.0 x 0.5 m) grass 200kg bedding materials per bed with 75% clippings 25% using of and rat manure. Three stocking rates of 1,2 and 3 kg per bed with three replicates each were tested. Clay pots were used for the study on the effects of different levels of vermicompost (0, 25%, 50%, 75% and 100%) and the recommended chemical fertilizer applications on the production of the test vegetables.

For the I. aquatica study, cuttings were placed in glass jars with 2-1 solutions of 0, 2.5 ml/ and 5 m/l and 5 m/l/l of vermicompost extract. The data were gathered after 47-49 days for the vermicomposting study, 45 days for the vegetable production study and davs for the growth study. root

The results showed that the highest vermicompost recovery (48%) and net production of earthworm biomass (3

kg) were attained with the stocking rate of 1 kg per bed after 35.3 days of vermicomposting. There were no significant differences in the production of cabbage, cauliflower and eggplant using 50%, 75% and 100% vermicompost, respectively, compared with their corresponding recommended chemical fertilizer applications. Primarv root growth was significantly better with 5 ml/l of those vermicompost extract compared with of control and lower concentration. the

The studies strongly indicate the feasibility of vermicomposting using *E. eugeniae* and the use of vermicompost as an organic fertilizer and root growth enhancer for vegetable crops. (Author's abstract)

Keywords: Biology, Eudrilus eugeniae, Vermicompost produced, Earthworms

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 24 Issue No. 1, 57-63 (Filipiniana Analytics) Fil(S) T1 N21 24/1 1999

#### Subcellular localization of cadmium in *Chlorella vulgaris* Beijerinck Strain Bt-09 Lintongan, P. B., Carino, F. A., Rivero, G. C.

Growth response curves of *Chlorella vulgaris* Beijerinck strain Bt-09 to sublethal concentrations of cadmium were evaluated. The growth responses of this microalgal isolate was determined through analysis of chlorophyll  $\hat{I}$ ± levels. Cadmium was effectively taken up by the cells as determined by Flame Atomic Absorption Spectrophotometry (F-AAS). Subcellular fractionation was undertaken to locate sites that accumulate cadmium. (Author's abstract)

Keywords: Biology, Chlorella vulgaris, Cadmium uptake, Subcellular localization

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 1, 29-36 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/1 2004

0230

#### Survey and census of ground lizards in the permanent field laboratory areas (PFLAS) in Mt. Makiling forest reserve

Buena, Elizabeth Regina L., Balatibat, Juancho B., Luna, Amelita C.

This study was conducted to survey the ground lizards of the Permanent Field Laboratory Areas (PFLAs) in Mt. Makiling Forest Reserve and estimate their population size using the pitfall trapping method and Schnabel formula for Repeated Mark-Recapture Technique. Lizard fauna were compared in terms of the number of species, number and size of individuals trapped and the condition of the immediate surroundings.

Five species of scincid lizards and one gekkonid were sampled from the Permanent Field Laboratory Area I and III. These were *Brachymeles gracilis, Mabuya multifascinata, Mabuya multicarinata, Sphenomorphus jogori, and Tropidophorus grayi,* and *Gecko gecko,* respectively. PFLA III (Plot 2) harboured all these species while PFLA I (Plot 1) had only 4 species oflizards. Furthermore, the population of the lizards in PFLA III was higher than in PFLA I. PFLA III is a plantation of Mahogany, *Swietenia macrophylla,* with less diverse plant species, limited food

resource, less litter biomass, and unhealthy interspecific interactions. The latter plot is a mixed secondary forest with high understorey, rich litter biomass, and rather diverse food resource (e.g. insects). This area, presumably, has healthy interspecific interactions, with a high predation rate resulting in less species and population of lizards.

The estimated population of all the species of lizards in PFLA I ranged from 6 to 45 individuals while for PFLA III, it ranged from 25 to 82. Among the species, *S. jagori* had the highest actual count and estimated population size. (Author's abstract)

Keywords: Biology, Brachymeles gracilis, Gecko gecko, Mabuya multifascinata, Pitfall trapping, Repeated-markrecapture technique, Sphenomorphus

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 97 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Translocation of the Clupeid Sardinella tawilis to another lake in the Philippines: a proposal and ecological considerations Mamaril, Augustus C.

The dwindling commercial catch of *Sardinella tawilis* (Clupeidae), locally known as 'tawilis', reported in recent years by local fisher folk in Lake Taal, Batangas, Philippines, could be a result of the interaction of factors such as over fishing, destructive fish-capture techniques, changes in water quality, and others. Like the rest of the handful of endemic freshwater fish species in the Philippines, *S. tawilis* is threatened with depletion of its stocks, if not with extinction in the near future. A conservation strategy that could be considered is the translocation of 'tawilis' to another lake in the Philippines, whose ecological features closely resemble those of Lake Taal and where 'tawilis' would receive socio-economic and cultural acceptability. Cases of clupeid introductions - natural and manmade, successes and failures - are presented from published literature. Special attention is given to the case of a well-planned trans-country (Thailand-to-Indonesia) attempt to introduce a clupeid fish. The broader questions of biodiversity, endemicity, conservation, and fish community structure in Lake Taal (and elsewhere) must be underpinned by sound basic taxonomy and ecology. (Author's abstract)

Keywords: Biology, Sardinella tawilis, Clupeidae, Taxonomy, Ecology

Conservation and ecological management of Philippine Lakes in relation to fisheries and aquaculture, Volume No. Issue No., 133-147 (Filipiniana Analytics) Fil(B) SH1 C74 2001

0232

#### Unraveling shrimp immunity by RNA interference technology Maningas, Mary Beth Bacano, Kondo, Hidehiro, Aoki, Takashi, Hirono, Ikuo

Shrimp aquaculture is an indispensable source of revenue in Southeast Asian and other developing countries. The industry however, is now plagued by a lot of disease and other disease-related problems. Understanding, therefore, the mechanism of the shrimp immune system will not only contribute to the basic knowledge of shrimp biology but

will be of enormous importance in the proper management and control of shrimp diseases as well. Here, we utilized RNA interference (RNAi) technology to elucidate the function *in vivo* of immune related gene in a crustacean system.

In vivo gene silencing studies were conducted utilizing transglutaminase (TGase) and clotting protein (CP) genes. Double stranded RNAs (dsRNA) were generated *in vitro* using T7 Ribomax express following the manufacturer's recommendations. Shrimp of about 1-2 grams weight were injected with 1 and 10 µg of dsRNA for each gene and gene expression in relevant organs were analyzed. RT-PCR was also conducted using primers from other immune-related genes.

Expression of TGase mRNA was inhibited in gills, heart, hemocyte, hepatopancreas, intestine and lymphoid organ while the CP gene was suppressed only in gills and heart tissues on day-1 post injection with 1  $\mu$ g and 10  $\mu$ g of TGase- and CP-dsRNA, respectively. Systemic gene silencing was observed for both genes and dosages as shown by mRNA expression, blood coagulation and protein data on day-7 post injection. Suppression of antimicrobial peptides (crustine and lysozyme) and genes involved in the prophenoloxidase system (prophenlooxidase and  $\alpha$ -2 macroglobulin)

following TGase and CP silencing demonstrate an association between blood coagulation and humoral biodefense genes in shrimp.

Results showed that RNAi technology is indeed a powerful tool in elucidating gene function in shrimp. Findings of this study can also serve as model for the possible prevention of viral or bacterial disease by utilizing reverse genetics technology through RNA interference. (Author's abstract)

Keywords: Biology, Shrimp, RNA interference, Transglutaminase, Clotting protein, Blood coagulation

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 86 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0233

# The use of *Gus*-reporter gene technique in the assessment of the competitive ability of *Rhizobium etli* nodulating *Phaseolus vulgaris* L. from the acidic soils of La Trinidad, Benguet, Philippines *Gutierrez, Rosemary M.*

Rhizobia bacteria are agriculturally important microorganisms that form nodules on the roots of legumes. Acidtolerant rhizobia could act as biological fertilizers in acid soils and the use of rhizobial strains in agriculture is more economical and a more environment-friendly technology. Using the gus maker gene, two new rhizobial isolates from La Trinidad, Benguet were tested for their nodulation competitiveness, i.e., the acid-tolerant, R. etli, RG-136 and the acid-sensitive R. etli RG-57, in comparison with a well studied acid-tolerant reference strain R. tropici UMR-1899. Two gus-marked derivatives were obtained and their competitive abilities were compared with their wild type parent strains and the reference strain using greenhouse experiments. Statistical analyses revealed that the wild type parent strains gave significantly higher nodule occupancies compared with the two gus-marked derivatives, indicating that the gus marker gene may not be a suitable genetic marker for the acid tolerant strains used in this study. (Author's abstract)

Keywords: Biology, Rhizobium, Gus gene system screening, Phaseolus vulgaris L., Rhizobium etli RG-136, Rhizobium etli RG-57, Rhizobium tropici UMR-1899

Philippine Scientist: a scholarly journal for natural and physical sciences and mathematics, Volume No. Issue No., 17-33 (Filipiniana Analytics) Fil(S) Q1 J95 v.49 2012

#### Vaccine development against the Philippine strain of Schistosoma japonicum Ramirez, Bernadette L.

Keywords: Biology, Schistosoma japonicum, S. mansoni, Vaccine development

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 24 Issue No. 1, 73-77 (Filipiniana Analytics) Fil(S) T1 N21 24/1 1999

0235

#### Wing ecomorphology and flight performance of bats in Pisan Cave, Kabacan, North Cotabato, Philippines

#### Tanalgo, Krizler C., Achondo, Marion John Michael M., Bretana, Bryan Lloyd P., Fernandez-Casim, Lothy, Tabora, John Aries G.

This research was conducted to study the functional morphology of the wings and flight performance of bats from Pisan caves, Kabacan, Cotabato, Philippines. This was carried out using mist netting method and measurements of mass (M) and basic Wing components that include wing span (B), wing area (S). Flight parameters such as aspect ratio and wing loading were computed from the values of wing component and predictions were made using aerodvnamic principles. Α total of 48 individuals representing eight species were studied. Results showed that Emballonura alecto, Myotis hors fieldii, and Pipistrellus javanicus have an average wing loading and low aspect ratio that indicate an intermediate speed in flight and exceptional maneuverability that is appropriate for catching moving Prey in a cluttered environment. High wing loading and low aspect ratio were noted in Cynopterus brachyotis, Eonycteriss pelaea, Hipposideros diadema, Rhinolophu sarcuatus and Rousettus amplexicaudatus. These value indicate that these bats though fast flyers, have poor maneuverability in terms of flight performance. The study suggests that wing morphology of bats affects flight performance and habitat selection which implies that maintenance of the habitat leads to the stability of the species population. (Author's abstract)

Keywords: Biology, Bats, Pisan caves, Wing morphology, Flight parameters, Habitat selection

Asian Journal of Biodiversity, Volume No. Issue No. , 113-125 (Filipiniana Analytics) Fil(S) QH75.A1 A85 v.3 2012

#### Zooplankton diversity in Philippine Lakes Mamaril, Augustus C.

Sustainable fisheries development partly depends on the availability of adequate zooplankton as principal food items of early life history stages of economically important fish species as well as of the adults of some species such as clupeids (e.g., *Sardinella tawilis* of Lake Taal in Batangas). The broad characteristics of the composition of freshwater zooplankton (Rotifera, Cladocera and Copepoda) of natural and man-made lakes in the Philippines are compared with those of the Oriental Region, in particular, and other tropical regions, in general. Two species of calanoid copepods are endemic, a somewhat remarkable occurrence considering that calanoids are represented by only five known species in the Philippines and absent in many large tropical lakes. *Daphnia*, which almost invariably influences food-web interactions and structures of plankton communities in temperate lakes, still has to be recorded. (Author's abstract)

Keywords: Biology, Zooplankton diversity, Rotifera, Cladocera, Copepoda, Sardinella tawilis

Conservation and ecological management of Philippine Lakes in relation to fisheries and aquaculture, Volume No. Issue No., 81-93 (Filipiniana Analytics) Fil(B) SH1 C74 2001

0237

#### Zooplankton spatial abundance and distribution in the West Bay of Laguna de Bay (Philippines) with notes on potential implications to food and health security Papa, Rey Donne S., Tordesillas, Dino T., Vitug, Lawrence D., Briones, Jonathan Carlo A., Zafaralla, Macrina T., Kada, Ryohei

Water quality and ecosystem health in the West Bay of the largest Philippine lake — Laguna de Bay — is threatened by the rapid urbanization and industrialization of its watershed. Zooplankton community analysis is often used as one of the tools to evaluate the trophic status, ecosystem health and sustainability of lakes. A study on the zooplankton species community composition and distribution in selected areas of the West Bay ofLaguna de Bay, Philippines was performed and correlated with water physico-chemical parameters to determine the response of the zooplankton community of the area to natural- and human-mediated disturbance on the lake which may have implications on fisheries, aquaculture and the health of the people inhabiting the lake shore. Zooplankton samples were collected from selected sites in the West Bay together with measurements of water quality parameters. A total of twenty twenty the samples examined. An assessment of their abundance and composition suggests that it is typical

of tropical eutrophic lakes with high productivity. Further comparisons with phytoplankton community structure, as well as physico-chemical parameters revealed zooplankton community responses to anthropogenic disturbance in the Laguna de Bay and its watershed. (Author's abstract)

Keywords: Biology, Freshwater zooplankton,, Tropical limnology,, Lakes, Aquaculture, Watershed

Acta Manilana, Volume No. Issue No. , 67-75 (Filipiniana Analytics) Fil(S) Q181 A81 v.60 2012

BOTANY

# Mutation frequency in mungo (*Phaseolus radiatus* L.) after treatment with an alkylating chemical mutagen

Palima, Corbelita J., Soriano, Joventino D.

Dormant seeds of green mungo (*Phaseolus radiatus* L.) were treated with aqueous solution of EMS at concentrations of 0.02M to 0.06M with phosphate buffer for periods of 6 to 24 hours at approximately 30°C. Seeds soaked in distilled water and buffer solution were used as controls.

The seeds were grown on moist blotting paper for germination percentage and seedling height measurements after seven days. The  $M_1$  seedlings were transplanted in field plots in a dose-to-row plan with two replications for determination of the frequency of somatic mutations, percentage of field survival at flowering stage, and seed-set. The  $M_2$  progenies were grown for determination of types and frequency of chlorophyll-deficient mutations as an index of the degree of genetic change due to the mutagen.

In general, a direct dose-effect relationship was obtained for the various biological criteria employed to measure the effectivity of the mutagen. These are percentage of germination after treatment, seedling height, somatic mutations, seed-set and germinal mutations.

Three types of induced chimeral sectors on leaves of  $M_1$  plants such as pale green, yellow green and yellow occurred with a frequency ranging from 4.65 to 31.03 per cent. Four types of chlorophyll-deficient seedling mutations were obtained, i.e., virescent, chlorina, xantha and albina with a frequency ranging from 0.23 to 7.55 per cent on the seedling basis and 2 to 26 per cent on the pod basis. (Author's abstract)

Keywords: Botany, Mungo (Phaseolus radiatus L.), Alkylating chemical mutagen, Distilled water, Buffer solution

Science Diliman, Volume No. Issue No., 81-103 (Filipiniana Analytics) Fil(S) Q1.A3 S35 v.1 1980

#### CHEMISTRY

0239

#### <sup>137</sup>Cs and <sup>210</sup>Pb distribution in Manila Bay sediment Sta. Maria, Efren J., Madrid, Jordan F., Olivares, Ryan U., Bulos, Adelina DM., Dayaon, Jennyvi P., Asa, Anie Day DC., Sombrito, Elvira Z.

Two radionuclides were measured in surface sediment samples taken from geographically distributed sections of Manila Bay, namely, cesium-137 (<sup>137</sup>Cs) and lead-210 (<sup>210</sup>Pb). Results indicated a noticeable change in the radioactivity concentration levels in sediments collected in 2005 and 2010, with a median concentration of 1.0 and 2.64 Bq kg<sup>-1</sup>, respectively. Higher levels of <sup>137</sup>Cs radioactivity were measured in the northern and inner portion of the bay adjacent to major river systems, agricultural and highly industrialized urban areas. <sup>137</sup>CS isotope increased in activity in most of the samples especially in the northwestern areas of Bataan and Pampanga with five times more than the activity from the first sampling measurements. Nevertheless, radioactivity concentrations observed in surface sediments along the bay are within the range of radioactivity in several areas monitored in the Northern Hemisphere. The country has been frequented by tropical cyclones and storms that have caused erosion, which may have introduced elevated material input into the bay. In addition, wind-driven circulation especially in the shallower areas of the bay is a possibility for the substantial sediment movement and accumulation along this coast. Conversely, areas with higher <sup>137</sup>Cs have lower values of <sup>210</sup>Pb. In an undisturbed environment, <sup>210</sup>Pb deposition

values are assumed nearly constant. Hence, changes in the radioactivity concentration levels of these radionuclides can be an indicator of pollution input from land-based sources, sediment movement and reworking in the coastal areas. At present, there is very limited information on the radioactivity level of various radioisotopes in Manila Bay. The data obtained are benchmark values against which changes that will be occurring in the bay can be assessed. (Author's abstract)

Keywords: Chemistry, Marine sediments, Manila Bay, Cs-137, Pb-21 0, Radioactivity, Radionuclide fallout

Philippine Nuclear Journal, Volume No. Issue No., 7-16 (Filipiniana Analytics) Fil(S) QC173 P55 v.16 2011

#### 0240

### Analysis of ecstasy in urine using gas chromatography with mass spectrometry *Portilla, Ma. Cristina B., Monlinong, Jason Paul , Garcia, Nissa Cheryl L., Pascual, Cherrie B.*

Ecstasy or methylene-dioxymethamphetamine (MDMA) is the most popular club drug and it acts as a stimulant and psychedelic, producing euphoria and sensual effects. This study aimed to develop a definitive method to analyze this drug in urine samples.

Ecstasy was analyzed by gas chromatography with mass spectrometry (GCMS). Blank urine spiked with known concentration of ecstasy was extracted with diethyl ether, concentrated and derivatized with N-methyl-N(trimethylsilyl) trifluoroacetamide (MSTFA) and injected into a Thermo GCQ Ion Trap. The gas chromatogram showed that the average retention time of MDMA was 7.50 min with diagnostic ions at m/z 130, 135, 250. Ephedrine was utilized as the internal standard and had an average retention time of 6.41 min with diagnostic ions m/z 130, 149 and 163.

Chromatographic results were repeatable. The coefficient of variation (CV) of the peak areas of MDMA at 250 ppb and 750 ppb, were 11 % and 7% respectively. Linear response was obtained for MDMA standards over the concentration range of 50 ppb to 1000 ppb using the internal standard method. The limit of detection (LOD) was 8 ppb while the limit of quantitation (LOQ) was 27 ppb.

Percent recoveries obtained for MDMA spiked in urine samples above the cut-off concentration of 500 ppb ranged from 95.5% to 102.9%, while for below cut-off concentration, they ranged from 95.5% to 102.3%.

This procedure may be used for routine confirmation of ecstacy in urine samples. (Author's abstract)

Keywords: Gas chromatography with mass spectrometry (GCMS), Ecstasy, Chemistry, Urine

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 121-122 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### 0241

#### Antimicrobial activity of the crude ethanol extract of the seeds of *Ipomoea muricata* (Jacq.) convolvulaceae against selected clinical isolates *Cardona, Carmelita C., Ysrael, Mafel C.*

The crude ethanolic extract of the seeds of *Ipomoea muricata* (Jacq.) Convolvulaceae was investigated for its activity against 45 bacterial clinical isolates. The 30% hydroalcoholic extract of the seeds of *I. muricata* exhibited strong antimicrobial activity against *Staphylococcus aureus* isolated from abscess, wound, and wound discharge. The *Bacillus subtilis* from corneal scraping, peritoneal fluid, urine and wound discharge was most sensitive to the extract showing a zone of inhibition of 21 mm. The extract showed strong activity against *Staphylococcus saprophyticus* isolated from urine and wound and *Streptococcus viridans* from the throat swab with zones of inhibition of 20 mm. However, the clinical isolates *S. aureus* isolated from seminal fluid, sputum in endotrachea, throat swab, blood, sputum, placental swab, and urine as well as the Gram-negative clinical isolates were resistant to the crude extract.

The crude extract of *I. muricata* at a concentration of 6000 mg/mL was found to be bacteriostatic against the clinical isolates *S aureus* from abscess (A-175), wound discharge (A-130), wound (4-459), *S. saprophyticus* from urine (A- 4534), wound (10-853), *B. subtilis* from peritoneal fluid (8-150), corneal scraping (4-707), urine (4-760) and wound discharge (4-814) with minimum inhibitory concentration (MIC) against these organisms of 3000  $\mu$ g/mL. The seed extract was bacteriostatic against *S. viridans* from throat swab (4-537) with MIC of 375.0  $\mu$ g/ml, and bactericidal against the same microorganism with minimum bactericidal concentration (MBC) of 750.0  $\mu$ g/ml,

The 30% hydroalcoholic extract of *I. muricata* was found active against *S aureus* A-175 and *B. subtilis* 4-707 equivalent to the activity of tetracycline at concentration of 1.93  $\mu$ /mL. and 1.88 ug/mL., respectively. The extract was active against *S saprophyticus* 10-853 and *S. viridans* equivalent to 1.86  $\mu$ g/mL, and 1.78  $\mu$ g/mL, tetracycline, respectively. This is the first published report on the activity of *I. muricata* seed extract tested against a range of clinical isolates. (Author's abstract)

Keywords: Chemistry, Ipomoea muricata (Jacq.), Convolvulaceae, Antimicrobial activity, Clinical isolates

Acta Manilana, Volume No. Issue No. , 49-55 (Filipiniana Analytics) Fil(S) Q181 A81 v.60 2012

#### Antimicrobial and cytotoxic terpenoids from Cymbopogon citratus Stapf. Ragasa, Consolacion Y., Phuong Ha, Huynh Ky, Hasika, Mith, Maridable, Julius B., Gaspillo, Pag-asa D., Rideout, John A.

The essential oil of *Cymbopogon citratus* Stapf., commonly known as lemongrass was extracted by the supercritical fluid extraction (SCFE) process. Fractionation of the essential oil afforded cymbopogonol (1) and citral (2). Citral isolated from the local collection of *C. citratus* contains neral (2a) and geranial (2b) in a 2.5:1 ratio. The stracture of 1 was elucidated by extensive 1D and 2D NMR spectroscopy. Antimicrobial tests on 1 and 2 indicated that they have moderate activity against *C. albicans* and low activity against *P. aeruginosa, E. coli, S. aureus,* and *T. mentagrophytes*. Both compounds were inactive against *B. subtilis* and *A. niger*. Citral was also found to be cytotoxic to colon adenocarcinoma (HCT 116) with an IC50 of 10.35  $\mu$ g/mL and to human lung adenocarcinoma (A549 with an IC50 of 17.74  $\mu$ g/mL. (Author's abstract)

Keywords: Chemistry, Cymbopogon citratus Stapf., Lemongrass, Citral, Cymbopogonol, Antimicrobial, Cytotoxic

The Philippine Scientist, Volume No. Issue No. , 111-122 (Filipiniana Analytics) Fil(S) Q1 J95 v.45 2008

### Chemiresistor electronic nose based on graphite composite for the detection of volatile organic compounds

#### Haygood, Klaud Jenssen F., Toledo, Aquinas Hyacinth G., Ranola, Rey Alfred G., Santiago, Karen S., Sevilla, III, Fortunato

An electronic nose system consisting of graphite composites and conducting polymers were developed for the detection of different VOCs. The sensing materials were graphite composites of insulating polymers such as epoxy, polystyrene (PS), polyethylene terephthalate-copolyvinyl acetate (PET-co-PVAc), poly-(dimethyl)-siloxane (PDMS) and cyanoacrylate (CA) and, conducting polymers such as polyaniline (PANi) and polypyrrole (PPy) doped with different dopants such as hydrochloric acid (HCI), sulfuric acid (H<sub>2</sub>SO<sub>4</sub>), sodium dodecylsulfate (SDS), p-toluenesulfonic acid (p-TSA) and dodecylbenzenesulfonic acid (DBSA).

The sensing materials were deposited as a thin film via spin coating (for graphite composite) and potentiostatic polymerization (for conducting polymers) onto a two gold (Au) wires with a gap of 150 mm mounted onto a Teflon substrate. The sensors were exposed on the headspace of the VOCs and the responses were measured using a linearized voltage output circuit. The E-nose system exhibited good reversibility (%RSD = 0.01-0.59), repeatability (%RSD = 0.05-0.80) and response time (40-750 s). Different patterns for each compounds as discerned from bar graphs and radar plots. Pattern recognition methods such as s such as principal component analysis (PCA) and cluster analysis (CA) revealed different cluster for different compounds.

These results demonstrate the potential of the developed e-nose for monitoring detecting volatile organic compounds in the environment. (Author's abstract)

**Keywords:** Chemistry, Chemiresistor, Electronic nose, Volatile organic compounds, Graphite polymer composite, Conducting polymers, Chemometrics.

Acta Manilana, Volume No. Issue No. , 43-48 (Filipiniana Analytics) Fil(S) Q181 A81 v.60 2012

0244

### Conductive polymers as host matrices for the dispersion of gold nanoparticles with electrocatalytic properties

#### dela Cruz, Angelica, Esteban, Anna San, Lapitan, Jr., Lorico, Tongol, Bernard John

Electropolymerization has attracted widespread interest in producing conductive polymers such as polypyrrole (PPy) and poly(3,4-ethylenedioxy) thiophene (PEDOT) with electrocatalytic and sensor applications. This study aimed to optimize the parameters for the electropolymerization of pyrrole and 3,4-ethylenedioxythiophene (EDOT) on Au polycrystalline electrode. Using cyclic voltammetric (CV) method, the monomer was polymerized anodically on Au polycrystalline electrode in HC1O<sub>4</sub> electrolyte at scan rates of 10 mVs<sup>-1</sup>, 50 mVs<sup>-1</sup> and 100 mVs<sup>-1</sup>. The surface morphology of the electropolymerized film on Au substrate was characterized using Scanning Electron Microscopy (SEM) and Non-Contact Atomic Force Microscopy (NC-AFM). Incorporation of Au nanoparticles on PPy-modified or PEDOT-modified Au electrode was accomplished by electrodeposition of gold metallic particles from an aqueous solution of HAuC1<sub>4</sub> at various deposition times. The dispersion of the Au metallic particles on PPy and on PEDOT films was investigated using SEM. Optimum conditions for the electropolymerization of the conductive polymers and for the electrodeposition of the Au metallic particles were utilized to produce metallic particles / conductive polymer composite films. The electrocatalytic behavior of these composite films towards ethanol and glucose oxidation was investigated. (Author's abstract)

**Keywords:** Chemistry, Conductive polymers, Polypyrrole, Polythiophene, Electropolymerization, Electrocatalysis, Sensors, Surface analysis

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 115-116 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0245

### The effect of dietary oil on the growth and intellectual capacity of mice *Aparato, Aurea R., Lagmay, Nora R.*

The nutritional values of three vegetable oils were evaluated on the basis of the growth response, the food efficiency ratio and the effect on mental activity. Avocado, sesame and coconut oil were the only sources of fat in the experimental diets fed to three groups of albino mice. Mice fed with avocado and sesame yielded higher body weight gains and food efficiency ratios than mice fed with coconut oil. This agrees with the reports made on the study of these oils by the biological assay. The values for the mental activity of mice fed with avocado and sesame diets were also higher. However, mice fed with avocado diet showed relatively higher values than those fed with sesame. It is possible that the content of essential fatty acids among others could be directly related to intellectual performance. (Author's abstract)

Keywords: Chemistry, Dietary oil, Food efficiency ratio, Coconute oil, Biological assay

Science Diliman, Volume No. Issue No., 1-19 (Filipiniana Analytics) Fil(S) Q1.A3 S35 v.1 1980

0246

### Effect of dopant ions on the electrical conductivity and microstructure of polyaniline (emeraldine salt)

Catedral, M. D., Tapia, A. K. G., Sarmago, R. V., Tamayo, J. P., del Rosario, E. J.

Samples of polyaniline (emeraldine salt) were prepared with different protonic acid dopants, namely, hydrochloric acid (HCI), nitric acid (HNO<sub>3</sub>), perchloric acid (HCIO<sub>4</sub>), sulfuric acid (H<sub>2</sub>SO<sub>4</sub>), and hydroiodic acid (HI). Using the two-point probe method, it was found that the samples had ohmic behaviors in which high linear coefficients were found in the range  $0.96863 \text{€}^{\circ} 0.9997$ . On the other hand, the electrical conductivities were measured using the Van der Pauw method. The undoped sample had a conductivity of  $5 \times 10^{-4}$  S/cm. The highest conductivity of 109.04 S/cm was observed for the HClO<sub>4</sub>-doped sample, while the lowest value (0.02 S/cm) was obtained for the HI-doped sample. These conductivities were compared with the computed energy gap between the highest occupied molecular orbital (HOMO) and lowest unoccupied molecular orbital (LUMO) where it was found that they are inversely proportional to each other. Scanning electron microscopy revealed significant differences among the samples in terms of shapes and morphologies. (Author's abstract)

**Keywords:** Chemistry, Dopant ions, Electrical conductivity, Microstructure of polyaniline, Emeraldine salt, Hydrochloric acid, Nitric acid, Perchloric acid, Sulfuric acid, Hydroiodic acid

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 41-46 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

#### Effect of functional iron oxide nanocrystals on the arsenic level in drinking water

Paragas, Danila S., De Guzman, Aileen G., Paragas, Danika Jade S., Imbag, Mark Dale S., Dela Cruz, Laurenz O.

Arsenic is a semi-metal element in the periodic table and a naturally occurring element in the earth's crust. It enters drinking water supplies from natural deposits in the earth or from the agricultural and industrial practices. It has created serious contamination of the environment, causing many mass poisonings throughout the world. This study was designed to prepare functional iron oxide nanocrystals (a nanomagnet) and be used in the treatment of contaminated with water arsenic. The synthesis of functional iron oxide nanocrystals was divided into three parts: soap making process, extraction of oleic acid from soap with commercial vinegar, and preparation of magnetite or functional iron oxide nanocrystals from rust and fatty acids. The functional iron oxide nanocrystals (0.5 g per litter of water) was placed in water contaminated with arsenic and stirred for 5 minutes. The formation of bubbles on the surface of nanocrystals was observed. The water samples before and after treatment was bought to the Natural Science Research Institute for the analysis of arsenic using THGA Graphite Furnace Atomic Absorption Spectroscopic method. Results of the analysis showed that the functional iron oxide nanocrystals was able to remove 85.89% of arsenic. The removal of arsenic is through nanomagnetism. Further studies on the effect of different amounts of iron oxide nanocrystals and concentration of arsenic in water must be conducted. (Author's abstract)

Keywords: Chemistry, Nanocrystal, Arsenic, Rust, Oleic acid, Nanomagnet

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 196 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

#### 0248

#### Electrochemical synthesis and characterization of poly(3,4-ethylenedioxythiophene)supported Pd-Sn nanoparticles dispersed on Au electrode for formic acid oxidation *Cabello, Mark Kristan E., Hsu, Hao Yuhn C., Garcia, Jonyl L., Tongol, Bernard John V.*

PdSn nanoparticles dispersed on polycrystalline Au electrode and poly(3,4-ethylenedioxythiophene )-modified polycrystalline Au electrode for the electro-oxidation of formic acid were synthesized using electrochemical methods.

Pd and Sn nanoparticles on polycrystalline Au electrode were synthesized via successive potentiodynamic electrodeposition. For the electrosynthesis of PdSn/PEDOT-modified polycrystalline Au electrode, PEDOT polymer was electrodeposited on polycrystalline Au via potentiostatic polymerization. Then, same electrodeposition procedure was done for PdSn deposition on PEDOT-modified Au electrode. Afterwards, the electrosynthesized electrocatalysts were subjected to electrocbemical characterization using cyclic voltammetry (CV). Lastly, the electrocatalysts were subjected to formic acid electro-oxidation by potential cycling.

PdSn dispersed on Au and PdSn on PEDOT-modified Au electrode were successfully electrosynthesized. The first oxidation peak of formic acid shifted at lower potential when Sn is added. Moreover, the PdSn/PEDOT-modified Au electrode has a more enhanced electrooxidation towards formic acid oxidation than the Pd/Au and PdSn/ Au catalyst due to the shift in the oxidation potential. (Author's abstract)

**Keywords:** Chemistry, Polycrystalline Au,, Poly(3,4-ethylenedioxythiophene), Formic acid, Potentiostatic electropolymerization, Potentiodynamic deposition, Pd, Sn

Acta Manilana, Volume No. Issue No. , 35-41 (Filipiniana Analytics) Fil(S) Q181 A81 v.60 2012

0249

#### Electroconductive polythiophene/polyester composite as *e*-cloth Macadangdang, Jr., Romulo R., Binag, Christina A.

Advances in textile technology and materials science are promoting a new breed of functional fabrics and at the same time conducting polymers have proven to be very useful in the fabrication of new materials such as conducting textiles. In this study, a conducting, flexible, and mechanically stable polythiophene/polyester (PTp/PE) patch was fabricated. The patch could be used as invigorator and bio-stimulator for fatigued and injured muscles and it could be an aid in removing cellulites.

PTp/PE was prepared by chemical polymerization with the following optimum conditions: 24 hours in diffusion bath (0.1 M thiophene monomer in chloroform) and 24 hours in polymerization bath (0.23 M ferric chloride dopant). The PTpIPE composite fabric exhibited good conductivity  $2.500 \times 10^{-3}$  S/cm (0.027% RSD, n=3) with 4.77% PTp content (12.23% RSD, n=3). Micrographs from scanning electron microscopy (SEM) showed PTp on the surface and in the interstices of the PE fabric. Results of the elemental analysis by energy-dispersive X-ray (EDX) spectroscopy showed the presence of sulfur (11.43%) in the fabric which is indicative of poly thiophene. A small and portable electronic circuit was assembled to supply electricity to the textile composite. The input voltage supplied to the circuit was 5 volts direct current (DC). The output voltage of 3 volts was measured by connecting the output connections of the circuit to the prepared conducting patch. The efficiency of the electronic circuit was 57.4%, thus the PTp/PE patch is a promising e-cloth. (Author's abstract)

Keywords: Chemistry, e-cloth, Bio-stimulator patch, Polythiophene, Polyester, Composite fabric

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 114-115 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0250

#### **Environmental mutagenesis, soil studies** *Lim-Syllanco, C.Y., Inofonada, V.F., Botuyan, M.V., Casareno R.*

Organic extracts of street soil samples from industrial, commercial and residential areas in Cainta, Makati, Mandaluyong, Manila, Marikina, Parañaque, Pasig, Quezon City, San Juan and Valenzuela were subjected to genotoxicity studies.

None of the samples exhibited direct DNA damaging potential as measured by the Rec Assay, indicating that the organic extracts of the street soil samples were not genotoxic before metabolic activation.

After metabolic activation, organic extracts of street soil samples from industrial areas of Cainta, Mandaluyong, Manila and Quezon City showed appreciable genotoxicity. The same observation was made of organic extracts from street soil samples from commercial areas of Cainta, Mandaluyong, Manila, Paslg, Quezon City and San Juan. Appreciable genotoxicity was also observed of organic extracts from street soils of residential areas in Makati, Marikina and San Juan. These were revealed by the host-mediated assay.

Chromosome breaking effects were observed in organic extracts of industrial areas in Cainta, Mandaluyong and Quezon City and also in commercial areas in Cainta, Mandaluyong, Pasig, Quezon City and San Juan. The same observation was made of organic extracts from street soils of residential areas in Makati, Marikina and San Juan.

These observations were correlated with benzo pyrene content of these street soil samples. (Author's abstract)

Keywords: Chemistry, Organic extracts, Street soil, Mutagenesis

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 15 Issue No. 4, 67-73 (Filipiniana Analytics) Fil(S) T1 N21 15/4 1990

0251

#### Essential oil content and antibacterial activity of some Philippine plants Torres, Rosalinda C., Ontengco, Delia C., Balgos, Nelly S., Villanueva, Merle A., Lanto, Eduardo A., Cruz, Ma. Cecelyn S., Ambal, Wilhelmina O., Estrella, Romulo R.

The essential oil content and antibacterial activity of eighteen (18) Philippine plants were determined using hydrodistillation and Kirby-Bauer Disk Diffusion Method, respectively. *Staphylococcus aureus* ATCC 25923. *Escherichia coli* ATCC 25922 and *Pseudomonas aeruginosa* ATCC 27853 were the bacterial strains used.

Results indicate that the oleoresin from *Canarium luzonicum* (Blume.) A. Gray (Manila Elemi) is the highest oilyielding plant material (18.57% v/w), followed by the leaves of *Pogostemon cablin* (5.03 % v/w), and the bark of *Cinnamomum mercadoi Vidal* (4.5% v/w). Likewise, Manila elemi oil showed strong antibacterial activity against *Staphylococcus aureus* and *Escherichia coli*. These two bacteria were also found susceptible to the oils of *Vetiveria* zizanioides, Mentha arvensis, Cinnamomum mercadoi, Zingiber officinale, Cymbopogon citratus, and Mentha spicata. (Author's abstract)

**Keywords:** Chemistry, Hydrodistillation, Kirby-Bauer Disk Diffusion Method, Staphylococcus aureus, Canarium luzonicum, Pogostemon cablin, Cinnamomum mercadoi Vidal, Escherichia coli, Vetiveria zizanioides, Mentha arvensis, Zingiber officinale, Cymbopogon citratus, Mentha spicata

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 24 Issue No. 1, 79-90 (Filipiniana Analytics) Fil(S) T1 N21 24/1 1999

#### Essential oil content and chemical composition of Philippine Cinnamomum mercadoi vidal (Lauraceae)

Torres, Rosalinda C., Melo, Catherine L.

The essential oil content of the leaves and bark of *Cinnamomum mercadoi* Vidal (Lauraceae) found in the Philippines was determined by water distillation in Clevenger type apparatus. The chemical composition of the leaf and bark oils was analyzed by gas chromatography. The compounds present in the hexane (non-polar) extract of the bark of *C. mercadoi* was also determined by gas chromatography-mass spectrometry.

The leaves of *C. mercadoi* yielded 2.0-3.22% (dry weight basis) essential oil while the bark oil yield was 1.0-4.76% (dry weight basis). The leaf essential oil was made up mainly of cinnamic aldehyde at 85.89%. Eugenol (6.28%) and caryophyllene (1.17%) were the other constituents detected. The total constituents detected represent more than 90% of the oil's composition.

Meanwhile, Philippine cinnamon bark oil's main components were methyl eugenol (57.55%), safrole (17.21%) and eugenol (6.27%). Cinnamyl alcohol (1.16%) and terpineol (0.48%) were the other components present.

Ten compounds were identified in the GC-MS analysis of the hexane extract comprising mainly the oily components of the bark. The major component identified was methyl eugenol (20.87%). Safrole (2.38%), eugenol (1.27%), ledol (3.22%); 4,4,8-trimethyltricyc1ododecane-2,9-diol (2.74%), tridecanoic acid (2.10%), spathulenol (1.75%), (-)Globulol (1.09%), (+)-epi-bicyclosesquiphellandrene (1.68%) and 14-methylmethylester pentadecanoic acid (1.46%) were the other constitutents detected. (Author's abstract)

Keywords: Chemistry, Cinnamomum mercadoi, Lauraceae, Essential oil, Chemical composition, Cinnamic aldehyde, Methyl eugenol

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0253

#### Essential oil content and chemical composition of Philippine Zingiber officinale Rosc. Torres, Rosalinda C., Manalo, Carmelita O., Villanueva, Merle A., Li, Ji

The essential oil content of Philippine *Zingiber officinale* Rosc. was determined by water distillation using the Clevenger type apparatus. The chemical composition of ginger oil was analyzed by gas chromatographymass spectrometry. The physicochemical properties of the oil were also evaluated.

The yield of essential oil from the sliced rhizomes of *Z. officinale* was 0.12% to 1.3% (v/w). Ground sample produced higher oil yield of2.1 %. By GC-MS analysis, the constituents identified in the oil were cineole (5.49%), - linalool (3 .5%), D-limonene (3.02%), camphene (2.65%), -citral (6.69%), -citral (9.12%), trans-geraniol (10.1%), borneol (1.55%), p-menth-1-en-8-o1 (2.09%), -citronellol (1.43%), citronellol acetate (1.25%), zingiberene (6.06%), -farnesene (3.45%), - myrcene (1.33%), -sesquiphellandrene (2.54%), hedycaryol (1.16%), 2-methyl-6-p-tolyl-2-heptene (2.75%) and eudesm-4(14)-en-ll-ol (1.17%). The constituents identified represent 74.8% of the oil's total composition. (Author's abstract)

Keywords: Chemistry, Ginger, Zingiber officinale, Essential oil, Chemical composition, GC-MS

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 124 (Filipiniana Analytics)

# Fabrication of anodic alumina oxide templates and their use for the electrosynthesis of polythiophene nanowires

Cui, Karina Milagros R., Binag, Christina A.

Nanowires of polythiophene (PTp) were electrochemically synthesized using the pores of the prepared anodic alumina oxide (AAO) templates. The anodization experiments were performed using Al foil to create alumina pores having pore diameters of 150-250 nm. The electrochemical polymerization synthesis of PTp nanowires was carried out using a potentiostatic condition in a three-electrode system. The best electropolymerization conditions were 0.1 thiophene Μ (Tp)monomer. 0.1 M tetrabutylammonium perchlorate (TBAC1O<sub>4</sub>) dopant, in 10.00 mL acetonitrile, at a temperature of  $0 \pm 1^{\circ}$ C, without stirring the polymerization solution using 1.6 V at 2 mA/cm<sup>2</sup> current density. Four-point probe conductivity tests were done to determine the electrical properties of the PTp nanowires formed. PTp nanowires revealed a higher conductivity of 11.30 S/cm (0.50% RSD, n=3) compared to the bulk polymerized A1 foil (1.45 S/cm). The scanning electron microscope image of PTp nanowires showed uniform cylindrical nodules with a diameter of ~ 150 nm. In this study, the facile AAO template synthesis method utilized for PTp nanowires growth gave higher conductivity that could find wider environmental and medical applications. (Author's abstract)

Keywords: Chemistry, Nanowires, Polythiophene, Template synthesis, Anodic alumina oxide, SEM

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0255

#### Fabrication of chitosan micron and submicron particles for drug sequestration Agbayani, Patricia Teresa F., Chakraborty, Soma

This study looks into the fabrication of nano-sized chitosan particles for *in vivo* drug sequestration. Nanoparticles, being porous in nature, can act like sponge that absorbs toxins and renders them inactive. Its high surface area to volume ratio makes it a more efficient way of flushing out toxins compared to using macromolecules. The biopolymer chitosan is the material of choice in this study because of its biocompatibility as well as abundance in the Philippines.

The particles were synthesized using precipitation and reverse microemulsion technique. Precipitation involved injecting chitosan solution into toluene and iso-octane, while the system was subjected to an ultrasound generator. The reverse microemulsion technique involved generation of chitosan nanoparticles in the reverse micelles of the surfactants Span 80 and Tween 80 in hexane. Glutaraldehyde was also used as a crosslinker.

An initial Scanning Electron Microscope (SEM) image showed that the particles generated via the precipitation method did not have well-defined surfaces. Instead, the reverse microemulsion method generated particles that were more rigid. The 10% (mol/mol) crosslinked system were of size 150-600nm. Also, Differential Scanning Calorimetry runs showed no drastic changes in sample transition temperature when the particles were subjected to a degradation test that simulated physiological conditions of pH 7.4 and 37°C. Surface area analysis of the nanoparticles is in progress using Brunauer, Emmett, and Teller (BET) analyzer. Chitosan can therefore form

nanoparticles by reverse micelles technique. The fabricated particles will be tested for sequestration of the drug propafenone, overdosing of which results in coma and seizures. (Author's abstract)

Keywords: Chemistry, Chitosan, Nanoparticles, Reverse microemulsion, Drug sequestration, Propafenone

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0256

### Fabrication of electrocatalyst based on PEDOT-PSS supported Pd nanoparticles for ethanol electro-oxidation

### Climaco, Maria Ivona F., Telan, Giovanna Janina D., Malijan, Frederick M., Garcia, Jonyl L., Fulo, Harris M., Tangol, Bernard John V.

Studies related on the search for an effective yet less expensive catalyst and support material for fuel cells, constitute a step on the development of possible solutions to increase the efficiency of a Direct Ethanol Fuel Cell while lowering its cost. Palladium nanoparticles were synthesized via oleylamine-mediated synthesis and precursor method to achieve a mean particle size of  $3.78 \text{ nm} \pm 0.45 \text{ nm}$  and  $3.63 \text{ nm} \pm 0.59 \text{ nm}$ , respectively as revealed by transmission electron microscopy (TEM). Poly(3,4-ethylenedioxythiophene) doped with poly(styrene sulfonate) (PEDOT-PSS) was prepared by a simple chemical synthesis procedure and was used as a supporting matrix for the Pd nanoparticles (PdNPs). Two different methods to remove the capping agent during the synthesis of metal nanocatalysts were studied, i.e. acetic acid washing and thermal annealing. It was found out that both thermal annealing and acetic acid washing were effective in removing the capping agent, oleylamine. The study was successful in developing an electrode based on PEDOT-PSS supported Pd nanoparticles which gave a current density of 0.90 mA/cm<sup>2</sup> for ethanol oxidation in alkaline medium, which is relatively lower compared to the activity of PdNPs–CNTs (carbon nanotubes)/Naûon–GCE (glassy carbon electrode) reported in the literature. The prepared electrode showed electrochemical stability even up to 50 oxidation cycles. This study is an effort pointing towards the development and possible commercialization of non-platinum based fuel cell anode dispersed on a conductive polymer matrix. (**Author's abstract**)

Keywords: Chemistry, Fuel cell, Electrocatalyst, Pd nanoparticles, PEDOT-PSS, TEM

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0257

### Factors contributing to the bioburden level of polyvinylpyrrolidone-kappa carrageenan hudrogel

#### Racadio, Charles Darwin T., Aranilla, Charito T., Feliciano, Chitho P., Lim, Wendy G., Relleve, Lorna S., Cruz, Veriza Rita C., Abad, Lucille V.

The reccuring problem of high bioburden level of Polyvinylpyrrolidone-Kappa Carrageenan (PVP-KC) hydrogels produced in industrial scale has befuddled both the researchers and the manufacturer involved in the

hydrogel's production. In an attempt to find a solution to this problem, different modifications in the current method of production have been devised and the bioburden levels of PVP-KC hydrogels produced using the modified methods were determined. The critical factors in the production parameters contributing to the bioburden of the hydro gels were then identified. Results showed a high bioburden level for the PVP-KC hydrogel prepared by overnight soaking of the PVP-KC components in non-sterile distilled water prior to further processing and eventual storage at room temperature preceding irradiation. This indicates that water sterility and storage temperature are critical factors that contribute to the hydrogel's bioburden level. Addition of bactericidal agent, namely Sodium metabisulfite, can decrease the bioburden counts of PVP-KC hydrogels by more than 350 times. (Author's abstract)

Keywords: Chemistry, Hydrogel, Carrageenan, Polyvinylpyrrolidone, Polyethylene glycol, Bioburden level

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0258

#### Fortification of sugar with vitamin A-technology generation and transfer Marero, L.M., Florentino, R.F., Aguinaldo, A.R., Capanzana, M.V., Saises, M.C.

This project aims to generate a technology for Vitamin A fortification of sugar; conduct storage studies. and transfer the fortification technology to a sugar milling plant. Raw materials were analyzed for potency of fortificant and quality of vegetable oil used in the antioxidant portion. Preparation of premix involved proper mixing of ingredients, operation of the Y-mixer, packing in suitable containers and labeling. Addition of premix to refilled sugar involved dosifier-mixer efficiency. homogeneity tests, packing of fortified sugar; and labeling. Quality control during premix preparation and fortification process, as well as on finished products were closely monitored. Vitamin A fortification of table sugar was initiated by the Philippines' largest sugar mill, the Victorias Milling Company, in 1996. with technical assistance from the FNRI-DOST, and financial assistance from UNICEF, following the Guatemala method with modifications. These were the use of coconut cooking oil in the antioxidant preparation fortification process. as well as on finished products were closely monitored. Vitamin a fortification of table sugar was initiated by the Philippines' largest sugar mill, the Victorias Milling Company, in 1996, with technical assistance from the FNRI-DOST, and financial assistance from UNICEF, following the Guatemala method with modifications. These were the use of coconut cooking oil in the antioxidant preparation, and the 50-feet line dosifier-conveyor/mixer for homogeneity in the fortification process. Preparation of vitamin A premix was based on 1/3 RDA of 4-6 year old children. i.e., 125 micrograms retinol per day, and an average consumption level of 12 grams. The recommended level of fortification included a 43.8% average due to processing and storage. Vitamin A concentration in the premix was 15 mg/g sugar and mixed to refined sugar at a ratio of 1 : 1000 to give 15 micrograms retinol per gran!. Stability test showed that the premix kept for 11 weeks, while fortified sugar showed 70 % retention after 6 months, at room temperature. However, in the second class sugar (Golden Sugar), retention of Vitamin A was only 50% at 7 month storage at room temperature. Vitamin A was only 50% at 7 months storage at room temperature. Vitamin A retained the hot coffee (96%), citrus juice (96%) and cake (84%). No differences were noted in the color and flavor of fortified sugar when compared to unfortified sugar. Vitamin A - fortified sugar was launched in the market by Victorias Milling Corporation in February, 1997. (Author's abstract)

Keywords: Chemistry, Sugar, Vitamin A fortification, Guatemala method, Antioxidants
## Free radical synthesis of endfunctionalized polymers Holdsworth, Clovia Isabel Z., Ken Busfield, W., Ouano, D., Thang, San H.

Endfunctionalized oligomers and polymers which can be used as building blocks for the syntheses of more complex structures and high performing materials, i.e. block and graft copolymers, networks, IPN, were prepared by free radical polymerization using allylic sulfides as chain transfer agents. These allylic sulfides which were found to efficiently introduce endreactivity to, and at the- same time lower the molecular weight of styrene, methyl methacrylate, methacrylonitrile and vinyl acetate single and mixed systems, act according to a two-step addition-fragmentation scheme resulting in an olefinic and either hydroxy or carboxyl endgroups. Block copolymers were successfully prepared from these endfunctional polymers. (Author's abstract)

Keywords: Chemistry, Oligomers, Polymers, Block copolymers, Graft copolymers, Networks, IPN

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0260

# Glycerol-crosslinked polyacrylic acid hydrogels Lee, Angela Lisandra S., Chakraborty, Soma

Glycerol is mostly generated as a by-product from soapmaking and biodiesel production process. With the increase in biodiesel production, glycerol is expected to be a surplus and, hence, it is practical to explore its potential uses. Polyacrylic acid (PAA) hydrogels are known to have excellent bioadhesive property which allows them to adhere to mucosal linings for extended periods, releasing encapsulated medications gradually with time. The objective of this study is explore the potential of glycerol to as а crosslinker for the fabrication of hydrogei. PAA

Hydrogels were fabricated by free-radical polymerization of acrylic acid (AA) at  $50^{\circ}$ C using benzoyl peroxide as initiator and acetonitrile as solvent. The PAA formed was crosslinked with glycerol in the presence of Novozym 435 in the same reaction vessel. The effects of various reaction parameters such as (1) presence of molecular sieves, (2) monomer to solvent ratio (3) reaction time were studied systematically.

Addition of molecular sieves to the system generated higher molecular weight hydrogels as compared to the reaction in the absence of molecular sieves. The ratio of 1:1 (v/v) AA:acetonitrile produced crosslinked PAA with a molecular weight of 2.1 x  $10^6$  g/mol after 6 hours of polymerization. Dilution of the system produced hydrogel of even higher molecular weight. The ratio of 1:2(v/v) AA:acetonitrile produced crosslinked PAA of 1.0 x  $10^7$ g/mol after 15 minutes of polymerization. The hydrogels swelled rapidly in deionized water. Almost 80% swelling was observed in 50 sec.

It can be concluded that glycerol can be used as crosslinker to fabricate PAA hydrogels. Moreover, since the fabricated hydro gels undergo rapid swelling, they can encapsulate water soluble drugs and can release them at a controlled rate These hydrogels will be evaluated for the controlled release of corticosteroid for the treatment of mouth ulcer. (Author's abstract)

Keywords: Polyacrylic acid, Chemistry, Hydrogel, Glycerol, Crosslinking, Drug delivery

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# The Identification of metallophytes in the Fe and Cu enriched environments of Brookes Point, Palawan and Mankayan, Benguet and their Implications to Phytoremediation *Claveria, Rene R., De los Santos, Carolyn Y., Teodoro, Katrina B., Rellosa, Mara A., Valera, Nestor S.*

It is important to consider the potential of plants in the remediation or rehabilitation of areas affected by mining as well as their capability of absorbing metals in anomalous amounts which could be an alternative to traditional mining. Phytoremediation is an innovative way of addressing the environmental impacts of mining. Studies on metallophytes have identified some plant species that thrive in nickeliferous laterites and in cupriferous soils. It has been of interest as to how these plants accumulate the heavy metals the soil contains, and specifically how much of the available metals are being taken up by these plants. In Brookes Point, Palawan, some of the identified plants that thrive in nickeliferous laterites, were Sapotaceae planchonella, Apocynaceae alstonia macropylla and Cunoniaceae weinmannia sp. Results showed similar responses among the plant species in terms of the total Fe content in their leaves, stems and roots. The positive relationship between the soil and plant components was observed manifesting the characteristics of indicator plants for Fe. Apocynaceae alstonia macrophylla specifically had high Fe contents in the root system making it also an accumulator and phytostabilizer for Fe. In Mankayan, Benguet, four native fern species that can tolerate the Cu enriched soils were identified and analyzed for Cu using the root-stern-leaf components. These species were Pteridium aquilinum, Dicranopteris linearis, Pteris sp. and Nephrolepis hirsutula. The results showed Nephrolepis hirsutala and Pteris sp. to be the best Cutolerant species. These plants were not only considered as indicator plants for Cu manifested by the positive correlation between soil and plant components but also as accumulators and phytostabilizers for Cu due to the high Cu content in their roots. These are characteristics of metallophytes and thus such plants may be used for phytoremediation. (Author's abstract)

Keywords: Chemistry, Metallophytes, Phytoremediation, Brookes point, Mankayan

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 21 Issue No. 2, 1-12 (Filipiniana Analytics) Fil(S) Q1.A3 S4 21/2 2009

# Ion chromatographic method with post-column fuchsin reaction for measurement of bromate in chlorinated water Genuino, Homer C., Espino, Maria Pythias B.

An ion chromatographic method that employs a post-column reaction with fuchsin and spectrophotometric detection was optimized for measuring bromate (Bro<sub>3</sub>·) in water. BrO<sub>3</sub>· is converted to Br<sub>2</sub> by sodium metabisulfite and then reacted with acidic fuchsin to form a red-colored product that strongly absorbs at 530 nm. The reaction of BrO<sub>3</sub>· and fuchsin reagent is optimum at pH 3.5 and 65°C. The method has a limit of quantitation of 4.5  $\mu$ g L<sup>-1</sup> and is linear up to 150  $\mu$ g L<sup>-1</sup> BrO<sub>3</sub>-. Recoveries from spiked samples were high ranging from 95 to 102 % using external standard calibration and 87 to 103 % using standard addition method. Intra-batch and inter-batch

reproducibility studies of the method resulted to RSD values ranging from 0.62 to 2.01 % and percent relative error of 0.12 to 2.94 % for Br03- concentrations of 10  $\mu$ g L<sup>-1</sup> and 50  $\mu$ g L<sup>-1</sup>. This method is free of interferences from common inorganic anions at levels typically found in chlorinated tap drinking water without preconcentration. The optimized method can be applied to trace analysis of bromate in chlorinated tap drinking water samples. (Author's abstract)

Keywords: Chemistry, Bromate, Fuchsin, Chlorinated water, Post-column reaction, Ion chromatography

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 21 Issue No. 1, 29-36 (Filipiniana Analytics) Fil(S) Q1.A3 S4 21/1 2009

0263

## Metal absorption capacities of <sub>κ</sub>-carrageenan blends *Cuyegkeng, Ma. Assunta C., Henares, Terence G.*

Lead, cadmium and zinc were allowed to bind to the sulfated galactan units of  $\kappa$ -carrageenan by preparing a mixture 1% κ-carrageenan 0.1 of in Μ  $Pb(NO_3)_2$ and  $Cd(NO_3)_2$ , equilibrating  $Pb^{2+}$ overnight. and The concentration in the supernatant was stripping the determined using potentiometric but initially analysis (PSA) concentration range for this application was much higher. The  $Pb^{2+}$  and  $Cd^{2+}$  concentrations were then determined by atomic absorption spectroscopy (AAS). The concentration of bound metal was calculated by subtracting the amount of metal in the supernatant from the amount in the original solution. Results show that  $Pb^{2+}$  and  $Cd^{2+}$  in solution is the complexed with carrageenan.

carrageenan-chitosan However, complexation with various and carrageenan-poly-N-isopropyl acrylamide (N-IPAAm) blends changes the amount of bound metal, indicating that the polyelectrolyte blend can be used to control the binding capacity of the biopolymers.

AFM micrographs show some change in the topology of the various polymer systems. Thermal analysis, FTIR and GPC were also used to characterized the polymer blends. (Author's abstract)

**Keywords:** Lead, Chemistry, κ-carrageenan, Carrageenan-chitosan, Carrageenan-poly- N-isopropyl acrylarnide, Cadmium, Zinc

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0264

# Microwave-assisted cadogan reaction: its application to synthesis of heterocyclic compounds Creencia, Evelyn C., Iizuka, Tomohiro, Horaguchi, Takaaki

Microwave-assisted heating under controlled conditions is a valuable technology for chemical syntheses since it often dramatically reduces reaction times and the formation of side products.

The Cadogan method for the synthesis of N-containing heterocycles involves the deoxygenation of aromatic nitro compounds in the presence of triethyl phosphite which acts as the reducing agent. The reaction is carried out at high temperature under nitrogen condition for several hours. Due to the versatility of Cadogan reaction, we have investigated it using microwave irradiation as the source of energy to drive the reaction to produce the desired products at shorter reaction time.

The aromatic nitro compound was mixed with triethyl phosphite in a suitable reaction vessel and irradiated with microwave radiation at a particular power for a number of minutes. The identity of the product was determined by IR,  ${}^{1}$ H and  ${}^{13}$ C spectroscopic data.

For the synthesis of carbazole from 2-nitrobiphenyl, we obtained a yield of 64% carbazole by irradiating 0.5 mmol of2-nitrobiphenyl with 3.0 mmol of triethyl phosphite in a test tube for 7.5 min at 600 W. When 0.5 mmol of2- nitrodiphenylamine was added to 2 mmol oftriethyl phosphite in a test tube and irradiated at 600 W for 5 min, 43% phenazine was obtained. When 2,2' dinitrobiphenyl was mixed with triethyl phosphite and irradiated at 80 W for 5 min or at 200 W for 36 no reaction was observed as evidenced on the TLC plates. At higher power or longer periods of time, decomposition took place and the mixture ignited. The following products were obtained when a mixture of 0.5 mmol of 2,2'-dinitrobiphenyl and 3.0 mmol of triethyl phosphite were irradiated at 600 W for 3 min, 200 W and 17 min and 200 W and 20 min: 24% carbazole and 11% benzo[c]cinnoline, 38% carbazole, respectively.

The results showed that microwave radiation could be conveniently used for organic synthesis as the reaction time is greatly shortened and littleor no side products are formed. (Author's abstract)

Keywords: Chemistry, Microwave, Carbazole, Cadogan reaction, 2-nitrobiphenyl, 2-

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0265

# Morphology-controlled polyacetylene films synthesized in liquid crystalline solvents Shirakawa, Hideki

We present two topics on morphology control of polyacetylene by using liquid crystalline materials as a solvent: one is a direct preparation of polyacetylene thin films in which the fibrils are arranged macroscopically in one direction, and the other synthesis of helical polyacetylene thin films. A nematic liquid crystal (LC) consisting of an equimolar mixture of 4-(trans-4-n-propylcyclohexyl)-ethoxybenzene and its buthoxybenzene derivative was used for this purpose. Macroscopic alignment of the catalyst dissolved in the nematic LC mixture was attained either by letting it simply flow down along the glass wall of the Schlenk flask or by keeping it on a flat surface under a magnetic field of 2 - 14 kG parallel to the catalyst solution. The electrical conductivity of thin films prepared by this method reached the level of  $10^4$  S cm<sup>-1</sup> along the oriented direction after iodine doping.

A planar structure has been accepted for both *cis* and *trans* isomeric polyacetylenes. However, we have synthesized for the first time helical polyacetylene thin films with clockwise and counterclockwise helical structures under asymmetric and anisotropic reaction field consisting of chiral nematic LCs by adding 5 wt.-% of chiral binaphthol derivative as a dopant into the nematic LC mixture. The films synthesized showed not only clockwise and counterclockwise helical structures of fibrils that are bundles of polyacetylene chains observed in scanning electron microscopes, but also positive and negative Cotton effects in the region corresponding  $\pi$ - $\pi$ \* transition of the

polyacetylene molecule in circular dichroism spectra. By virtue of its high electrical conductivity of  $1.5 \times 10^3$  S cm<sup>-1</sup> upon iodine doping, the present helical polyacetylene could be promising candidates for molecular solenoid, and electromagnetic shielding

and absorptive material. (Author's abstract)

Keywords: Chemistry, Liquid crystal, Polyacetylene films, Ethoxybenzene, Buthoxybenzene

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0266

## Nanoparticle dispersions in carrageenan films Enriquez, Erwin P., Aliganga, Anne Kathrena A.

Motivated by the widespread interest in Q-sized semiconductor particles (e.g., CdS, TiO<sub>2</sub>) and the relatively abundant seaweed resource of the Philippines, we initiated studies of dispersed semiconductor nanoparticles in seaweed biopolymers, particularly,  $\kappa$  and *i*-carrageenan. *Iota*-and  $\kappa$ -carrageenan are sulfated galactans with an average of single and double sulfation groups per repeat unit, respectively.

Cadmium sulfide was grown *in situ* on adsorbed, ultra thin films of the polysaccharide by treatment with aqueous CdCI<sub>2</sub> followed by exposure  $H_2S$ The to gas. the films resulting nanoparticles were studied by following the UV-Vis spectra of during exposure to  $H_2S$  gas. The absorption band edge of the CdS-carrageenan composite was observed to vary from 2.8 eV absorption 2.6 eV Based band edge theory to on for semiconductor particles, these results are indicative of nano-sized CdS particles ranging from 40 Å to 60 Å diameter. The particle size and film morphology were additionally studied by atomic force microscopy (AFM). AFM images showed various particulate morphologies: from small particles to rod-like of dimensions in the order of 50-100 nm. These images reveal what appear to be templated crystallization of CdS in the biopolymer matrix. (Author's abstract)

Keywords: Chemistry, K-carrageenan, I-carrageenan, Iota, Nanoparticle, Cadmium sulfide

Advance Polymers for the 21st Century: proceedings of the DOST-JSPS workshop on materials and polymer chemistry, Volume No. Issue No. , 23-36 (Filipiniana Analytics) Fil(B) QD380 A95 1998

0267

# Occurrence and determination of Haloacetic Acids in Metro Manila drinking water Rodriguez, Irene B., Espino, Maria Pythias B.

Haloacetic acids are found in chlorinated water with high organic matter content. An analytical method based on a US EPA method for measuring these compounds in water is described. The optimized method used diethyl ether as extraction solvent with sulphuric acid-methanol as esterification agent and subsequent detection by gas chromatography-electron capture detection. Evaluation of this method showed that it was linear in the concentration range of 10 to 150  $\mu$ g L<sup>-1</sup> and the method detection limits were from 17 to 57  $\mu$ g L<sup>-1</sup>. Although the method demonstrated low recoveries (16 to 43%), it is useful in the quantitative determination of monochloroacetic acid as well as the qualitative determination of other haloacetic acids in water. Drinking water samples taken from different areas in Metro Manila serviced by the local treatment plants were analysed using the method. Monochloroacetic acid was quantified and found in concentrations ranging from 19 to 157  $\mu$ g L<sup>-1</sup>. In most of the water samples, the concentration of monochloroacetic acid exceeded the US EPA maximum allowable total concentration of 60  $\mu$ g L<sup>-1</sup> for the five haloacetic acids (monochloro-, dichloro-, trichloro-, monobromo-, and dibromoacetic acids) in drinking water. This initial study established the occurrence of potentially harmful haloacetic acids in the local drinking water supplies. (Author's abstract)

Keywords: Chemistry, Haloacetic acids, Disinfection by-products, Drinking water, Chlorination

# Polymeric membranes for pressure-driven filtration del Rosario, Ernesto J.

Pressure-driven membrane filtration involves molecular separations based on selective permeation of molecular species through membrane pores and / or preferential solubility of molecules in the membrane matrix. Filtration processes which do not involve a phase change include microfiltration (MF), ultrafiltration (UF) and reverse osmosis (RO) while those accompanied by a phase change include pervaporation (PV) and membrane distillation (MD). Polymeric membranes for pressure-driven filtration are usually prepared by the phase inversion method wherein a thin film consisting of a ternary solution of polymer, solvent and non-solvent is coagulated by immersion in a non-solvent.

Polysulfone (PS) membranes were prepared and used for the micellarenhanced ultrafiltration (MEUF) of coconut water. The sugar solute was entrapped in micelles formed by sodium dodecyl sulfate or betaine above the critical micelle concentration (<u>cmc</u>); this was shown by the drastic increase in solute rejection by the PS membrane above the <u>cmc</u>.

UF membranes prepared from acetylated bacterial cellulose (*nata de coco*) were used to decolorize synthetic and natural melanoidins. Maximal decolorization of 73.8% and 93.8% were observed for synthetic and natural melanoidins, respectively, using membranes prepared from 25% cellulose acetate in the polymer (dope) mixture.

Preliminary studies were conducted on the application of MF, UF, PY and MD for processing mango puree. The decay curves for permeate fluxes were evaluated in terms of membrane fouling. Gas chromatographic analysis was done on the aroma compounds in the retentates and permeates after membrane filtration using different membranes. (Author's abstract)

**Keywords:** Chemistry, Polymeric membranes, Microfiltration (MF), Ultrafiltration (UF), Reverse osmosis (RO), Pervaporation (PV), Membrane distillation (MD), Polysulfone (PS), Micellarenhanced ultrafiltration (MEUF)

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 21 Issue No. 2, 35-41 (Filipiniana Analytics) Fil(S) Q1.A3 S4 21/2 2009

# Preparation and photoelectrochemical characterization of polyaniline doped with copper phthalocyanine tetrasulfonate

Carino, Stephen R., Ordonez, Ishmael S., Sumera, Florentino C.

Photoelectrochemistry of polyaniline (PAni), a conducting polymer deposited on an indium-doped tin oxide (ITO)-coated substrate. studied glass was in aqueous medium consisting of 2mM Fe(CN)6<sup>3-/4-</sup> in 1M KCI. On illumination of the polymer-modified electrode with white light, cathodic densities  $20\mu A/cm^2$ photocurrent greater than were detected. Doping of the conducting polymer with a dye, copper pthalocyanine tetrasulfonate (CuPcTS) doubled the photoelectrochemical response to about  $40\mu$ A/cm<sup>2</sup> at applied potential of 0.0V vs Ag/AgCI. The polymer was prepared by electropolymerization of aniline in  $0.1M H_2SO_4$  via repeated cycling between 0.0 to 0.7V vs. Ag/AgCI. Copper phthalocyanine tetrasulfonate (Na salt) was incorporated by polymerizing the aniline monomer in the presence of the dye. The conducting polymer-dye composite was characterized by IR, UV-Vis, SEM, and cyclic voltammetry. (Author's abstract)

**Keywords:** Chemistry, Polyaniline (PAni), Copper pthalocyanine tetrasulfonate (CuPcTS), Photoelectrochemical cell, Photosensitizer dye, Conducting polymer, Electropolymerization

Advance Polymers for the 21st Century: proceedings of the DOST-JSPS workshop on materials and polymer chemistry, Volume No. Issue No. , 83-96 (Filipiniana Analytics) Fil(B) QD380 A95 1998

0270

# Sedimentation rate estimates in Sorsogon Bay, Philippines using <sup>210</sup>Pb method Aniago, Ryan Joseph, Madrid, Jordan F., Sta. Maria, Efren J., Olivares, Ryan U., Asa, Anie Day DC., Dayaon, Jennyvi P., Bulos, Adelina DM., Sombrito, Elvira Z.

Sorsogon Bay has experienced a long history of recurring harmful algal blooms over the past few years. In an attempt to establish a chronology of events in the sediment layer, lead-210 (<sup>210</sup>Pb) dating method has been utilized in estimating sedimentation rates from three selected areas along the bay. Based on the unsupported <sup>210</sup>Pb data and by applying the Constant Initial Concentration (CIC) model, the calculated sedimentation rates were 0.8, 1.3 and 1.8 cm yr<sup>-1</sup> for sediment cores collected near the coastal areas of Castilla (SO-O 1), Sorsogon City (SO-07) and Cadacan River (SO-03), respectively. High sedimentation rates were measured in sediment cores believed to be affected from frequent volcanic ash releases and from areas near human settlement combined with intensive farming and agricultural activities. The collected sediments may indicate the general quality and composition of the sediment samples, i.e., amount of organic matter and grain size. The calculated sedimentation rates obtained provided an overview of the sedimentation processes and reflect the land use pattern around the bay which may help in understanding

history and distribution of materials and nutrient input relative to the occurrence of harmful algal bloom in the sediment columns. (Author's abstract)

Keywords: Sorsogon Bay, Chemistry, CIC model, Unsupported Pb-210, Sedimentation rate

Philippine Nuclear Journal, Volume No. Issue No., 17-26 (Filipiniana Analytics) Fil(S) QC173 P55 v.16 2011

# Side-chain polymer as matrix in cholesteric liquid crystals/polymer composites *Cada, Leonorina G., Domingo, Zenaida, Laag, Eleanor, Descallar, Jenny*

Liquid crystals/polymer composites were prepared by dispersing cholesteric formulations (coco-cholesteryl esters:E7) in commercial polymethylrnethacrylate (PMMA) and in laboratory synthesized side-chain polymers (SCP). The side-chain copolymers were obtained via the ring opening reaction of a commercially available epon resin, ethyleneglycol diglicidyl ether, with the 4-(ω-arninohexyloxy)-4'-cyanobiphenyl nematic properties of the resulting and twisted nematic cholesteryl 4-arninobutyrate. Switching the PMMA as polymer-dispersed liquid **PDLCs** using crystals (PDLC) were evaluated. matrix exhibited distinguishable droplet with bipolar and twisted radial configuration. Α maximum voltage of needed 70:30 by weight (LC:PMMA) 60 volts was to transform a composite into transparent state. LC formulations dispersed in the SCP bearing а cyanobiphenyl cholesteryl and pendant were found to exhibit fingerprint texture. groups LC/PMMA Compared LC/SCP to the composite, the dispersions required lower voltage for switching. (Author's abstract)

**Keywords:** Chemistry, Side-chain polymers (SCP), Coco-cholesteryl esters, Polymer-dispersed liquid crystals (PDLC), Aminohexyloxy

Advance Polymers for the 21st Century: proceedings of the DOST-JSPS workshop on materials and polymer chemistry, Volume No. Issue No. , 97-102 (Filipiniana Analytics) Fil(B) QD380 A95 1998

0272

## Spectrophotometric analysis of α-tocopherol using emeraldine film Monlinong, Jason Paul, Portilla, Ma. Cristina B., Bugayong, Monica G., Pascual, Cherrie B.

 $\alpha$ -Tocopherol is an antioxidant, which slows down or prevents the oxidative damage to our body. This antioxidant was analyzed spectrophotometrically using emeraldine film as the sensor.

The polyaniline (PANI) film in emeraldine form (green film) was first chemically synthesized using aniline hydrochloride and ammonium persulfate onto the surface of a plastic acetate film. The polymerization was carried out for 2 hours at room temperature.

The prepared emeraldine film exhibited maximum wavelength at 700 nm in the optimum pH of 2. The changes in absorbance of the chemically polymerized emeraldine film in the presence of  $\alpha$ -tocopherol at 700 nm were studied.

 $\alpha$ -tocopherol produced a decrease in the absorbance of the emeraldine film and the change in absorbance was proportional to its concentration. The plot of the change in absorbance versus  $\alpha$ -tocopherol concentration was linear

in the range of 0 to 150 mg/L. Repeatable responses were obtained. Values of the coefficient of variation (CV) ranged from 0.09 to 0.2 %. The method was sensitive and the limit of detection for  $\alpha$ -tocopherol was 0.03 mg/L.

The method was applied to the analysis of a pharmaceutical preparation of  $\alpha$ -tocopherol. The amounts of  $\alpha$ -tocopherol measured were in good agreement with the label claim. This study has shown that PANI film in the emeraldine form can be an effective sensor for the detection of  $\alpha$ -tocopherol. (Author's abstract)

Keywords: Chemistry, a-tocopherol, Antioxidant, Emeraldine film, Polyaniline (PANI), Spectrophotometric analysis

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 122 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0273

# Studies on the utilization of citrus wastes Anzaldo, Felicidad E., Briones, Annabelle V.

The volatile oil was removed from the wastes of calamansi (Citrus microcarpa Bunge), suha (Citrus grandis L.) and dalanghita (Citrus aurantium L.) by hydro-steam distillation and by expression. Hydro-steam distillation gave the highest yield. The physicochemical properties of the oils were also determined. Distilled oils have higher values of acid and ester numbers with lower values of specific gravity and refractive index than the expressed oils. Identification of the chemical constituents was done by thin -layer chromatography, gas-liquid chromatography and infra-red spectroscopy. The results showed the presence of limonene, citral, geraniol, L- pinene, β-pinene, terpineol and

The residues after distillation of the volatile oil were utilized for the production of pectin. The results recorded a yield of 5.51% for dalanghita, 4.26% for calamansi and 1.34% for suha. The product obtained conforms with the specifications set by the United States Pharmacopeia XXII (1990) and are classified as rapid-set type.

Utilization of oil-free citrus wastes for carotenoid production was also done. The highest yield of carotenoid content was observed in calamansi as compared to suha and dalanghita. (Author's abstract)

**Keywords:** Chemistry, Calamansi (Citrus microcarpa Bunge), Suha (Citrus grandis L.), Dalanghita (Citrus aurantium L.), Hydro-steam distillation, Chromatography

NRCP Research Journal, Volume No. 3 Issue No. 2, 115-142 (Filipiniana Analytics) Fil(S) Q179.9 N323 3/2 1993

0274

# Synthesis and characterization of chitosan and κ-carrageenan IPN hydrogel systems for transdermal drug delivery Gonzales, Christian, Dalafu, Haydee, Chua, Modesto T., Chakraborty, Soma

Interpenetrating polymer network (IPN) hydrogel systems were synthesized using the biopolymers--chitosan, modified chitosan and  $\kappa$ -carrageenan, along with polyacrylic acid (PAA) as the second component for transdermal

#### drug

#### delivery

Chitosan-PAA semi-IPN hydrogel system was fabricated by polymerization of AA in the presence of the crosslinker N,N'methylenebisacrylamide (NN'MBA) and chitosan/modified chitosan. 3-chloro-2hydroxypropyltrimethylammonium chloride (quat 188) was used as the modifier to impart antibacterial property to chitosan with. Since K-carrageenan film has poor strength, for the -carrageenan-PAA system, a full IPN was NN'MBA-crosslinked PAA NaOH-crosslinked synthesized with and κ-carrageenan.

IPN hydro gels were allowed to swell in deionized water. It was detected that the increase of crosslink density, slowed down the rate of swelling of the system. In the case of chitosan-PAA semi IPN, the rigidity of the hydrogel increased with the increment of the chitosan component of the system. Incorporation of Quat 188 further improved the structural integrity of the hydrogel and hence the transition temperature as revealed by differential scanning calorimetry analysis.  $\kappa$ -Carrageenan-PAA IPN also showed improved rigidity with the increase of  $\kappa$ -carrageenan content as both the systems swelled rapidly without rupturing on addition of deionized water.

Since these hydrogels can swell without rupturing, they can incorporate drugs solubilized in water and can be used as patches for transdermal drug delivery. These hydro gels are under evaluation for the incorporation and release of the drugs silver nitrate and mafenide acetate, the drugs that are used for the treatment of wound due to burn. (Author's abstract)

Keywords: Chemistry, Chitosan, Polyacrylic acid, Interpenetrating network, ĸ-carrageenan, Quat 188

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 118 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0275

# Synthesis of glycerol-crosslinked poly(methylmethacrylate) microparticles for the controlled delivery of mosquito repellent Sala, Leo Albert G., Villanueva, Keith Michael A., Chua, Modesto T., Chakraborty, Soma

Cross linked polymers can act as controlled release device to serve as sustained release source of mosquito repellant for a long period of time. One such polymer is poly(methylmethacrylate)(PMMA). However, being relatively hydrophobic it shows limited swelling in amphiphilic and polar solvents and hence limits its encapsulation and release application. This can be remedied by the use of a more hydrophilic moiety in the polymer network such as glycerol which is highly hydrophilic due to the presence of three hydroxyl (–OH) groups. Hence the research focused on the fabrication of glycerol crosslinked poly(methyl methacrylate) (GXPMMA) nano particles that can be used for the controlled release of mosquito repellent DEET (N, N-diethyl-m-toluamide). GXPMMA was synthesized by polymerization and crosslinking MMA with glycerol in one step in the presence of biocatalyst Novozyme 425, initiator benzoyl peroxide in tolerance peroxide in toluene. It was observed that increase in reaction temperature from 50 to 70 °C, and decrease in the amount of toluene resulted in the formation of the product in shorter period of time. GXPMMA showed maximum swelling in amphiphilic solvent acetone. GXPMMA was converted into nanoparticles of size 200 nm by nanoprecipitation technique. DEET was incorporated into nanoparticles by dispersing the particles in acetone containing DEET. It was released at a controlled rate for 6 h. (Author's abstract)

Keywords: Chemistry, Nanoparticles, Glycerol, Poly(methyl methacrylate), DEET, Mosquito repellant

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 152 (Filipiniana Analytics)

# Total mercury in three fish species sold in a Metro Manila Public Market: monitoring and health risk assessment

Africa, Criselda R., Pascual, Artemio E., Santiago, Evangeline C.

The total mercury concentrations in *bangus* or milkfish (*Chanos chanos* Forskal), tilapia (*Oreochromis nilolicus*) and *galunggong* or round scad (*Decapterus spp.*) purchased from a local market in Metro Manila from 5 August to 20 October 2004 were determined by cold vapor atomic absorption spectrophotometry. The ranges of total mercury concentrations observed from about 30 composite test samples for each fish species were 0.0060 to 0.015 mg kg<sup>-1</sup> (wet weight) for *bangus*, 0.0041 to 0.017 mg kg<sup>-1</sup> (wet weight) for tilapia and 0.014 to 0.05 mg kg<sup>-1</sup> (wet weight) for *galunggong*. Risk assessment for neurological effects associated with the consumption of the fish species with the highest concentration of mercury (0.05 mg kg<sup>-1</sup> for *galunggong*) was done. The calculated daily dose of total mercury of  $0.06 \,\mu g \, d^{-1} \, kg^{-1}$  body weight indicates that consumption of anyone or any combination of *bangus*, tilapia, and *galunggong* sold in Nepa-Q-Mart from August 5 to October 20 in 2004 does not entail risk of adverse neurological effects. (**Author's abstract**)

Keywords: Chemistry, Milkfish, Cold vapor atomic absorption spectrophotometry, Round scad, Health risk assessment, Mercury monitoring, Tilapia

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 21 Issue No. 1, 1-6 (Filipiniana Analytics) Fil(S) Q1.A3 S4 21/1 2009

0277

# Water quality analysis and utilization of small farm reservoirs (SFRs) for aquaculture in Region III Torres, L. D., Saturno, J. O., Gutierrez, R. L.

This research project was conducted to improve aquaculture production in Region ill through water quality analyses and utilization of small farm reservoirs (SFRs) for sustainable community development.

A total of23 farmer-cooperators (FCs) from various municipalities of the region were involved in the study after seminar-orientation. Two different culture systems, extensive (GMT) and semi-intensive .(GMT, GIFT and FAC Selected Lines) randomly assigned were tested using the genetically improved strains of Oreochromis niloticus (Nile tilapia). Growth monitoring is done every month and water analysis is bi-monthly or weekly if necessary while pesticide residue and metal detection performed to each were prior culture system.

In phase I, results showed that most SFRs have water pH within the ideal range for fish culture while DO and BOD were at tolerable levels. Phosphate values are less than 200 ppm while tWo sites gave higher than the allowable values but corrective measures were done at once. Abucay, Bataan and Talugtug, Nueva Ecija showed positive results for Organophosphorous using Rapid Field Kit (RFK.) however, Gas Chromatographic analysis confirmed the presence of the same for Talugtug, Nueva Ecija. Step-wise regression model identified percentage recovery related to phosphate and sodium as the main contributors, but phosphate as the lone predictor of average body weight (ABW) and average growth rate (AGR).

Phase II revealed that total ammonia level remained below the safe level while heavy metals, Cu and Hg were minimal and within the tolerable limit set by USFDA. No detectable residue was detected for both analyses for pesticide residue. Copper, predator, fish strain, mercury, BOD, hardness, DO and potassium ion were predictors of percentage recovery using the same regression model. Further, predator and strain as predictor of ABW while strain was the lone predictor variable of AGR

Both type of culture systems exhibited high percentage recovery though lower fish density than the carrying capacity resulted to better growth rate and fish average body weight (ABW). Combination of rain, deep well and natural spring as sources of water is beneficial to tilapia and water exchange of at least 2-3 times every culture period yielded better harvest. Generally, SFRs water in the region is classified hard and relatively safe, an indication of its suitability for fish culture. (Author's abstract)

Keywords: Chemistry, Water quality, SFRs, Reservoirs, Small farm reservoir, Aquaculture

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 30-31 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

# ECOLOGY

0278

## Some butterflies of Boracay Island Cayabyab, Bonifacio F., Alcantara, Edwin P.

Boracay Island, Malay Aklan is one of the well known and busiest tourist destination in the country at present. Owing to the increasing demand for space for commerce and domiciles, the butterflies habitat and range in this island resort are rapidly diminishing. We conducted a rapid survey of the butterflies at Boracay last April 2010 to document the butterfly fauna and contribute in the biodiversity inventory of the locality.

We noted down the species that we observed based on their flight pattern and morphological appearance. In other cases we use sweep net to examine closely the butterflies and release them later after confirming our identification.

A total of thirty two species from seven families were noted. The order of decreasing density of the seven families was: Papilionidae (8) > Nymphalidae (7) > Pieridae (6) > Danaidae (3) > Hesperiidae (4) = Lycaenidae (4).

Additional counts particularly in the watershed will be included in the future to be able to record the species that are strictly present in forested areas. We will also invite partners in the locality. (Author's abstract)

Keywords: Ecology, Butterflies, Boracay, Tourist, Island, Resort

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 130 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

### Philippine biodiversity: ecological roles, uses, and conservation status

Alcala, A. C., Alcala, E. L., Buot, Jr., I. E., Diesmos, A., Dolar, M.L., Fernando, E. S., Gonzalez, J. C., Tabaranza, B.

The Philippines has been recognized as having one of the world 's megabiodiversity centers for terrestrial and near-shore marine fish fauna. This is due to a number of factors: insular condition providing barriers to faunal and floral dispersal, isolated high mountain areas promoting high levels of endemism as a result of geographic isolation, tropical rain forests providing equable climatic conditions year round, and unique geological origin of islands. The paper deals with species of seed-bearing and non-seed-bearing flowering plants, freshwater and top carnivorous fish, amphibians and reptiles, birds, and terrestrial and marine mammals. The main topics discussed are conservation status at the species level, values and uses of biodiversity, threatened and endangered species, recommendations on their conservation. (Author's abstract)

Keywords: Ecology, Biodiversity, Endemism, Conservation, Endangered species

Transactions of the National Academy of Science and Technology, Volume No. 28 Issue No. 2, 203-214 (Filipiniana Analytics) Fil(S) Q149.P5 N25 28/2 2006

# **EDUCATION**

0280

# The rural women entrepreneurs: their business profiles, entrepreneurial behaviors, management styles, problems and prospects Sulabo, Evangeline C., Domingo, Lorna P.

Entrepreneurial ventures have provided rural women and their families resource capabilities to cope with the rising social and economic pressures on their families. Rural women entrepreneurs, who were mostly married and with college education, gleaned their entrepreneurial ideas from outside their formal education, i.e. inclinations, needs, exposure, experiences, and influence of other people. Although a significant portion of them inhereted their business from their parents, most of them decided to engage in business after proper consultation with their husbands and other people in the same business. Proprietorship was the most common type of business ownership. Trading, particularly selling of either fresh, cooked or processed food items, was the most popular type of business they engaged in. The use of feasibility study or other form of written business plan was not commonly practiced and they determined the business feasibility of an enterprise "mentally." Business earnings was determined mostly on the basis of expenses and sales of the business or on the mark-up for the items bought. The ambulant peddlers or vendors did not usually register their business because they considered these as petty or "small time" businesses where income was only meant to meet the daily basic needs of their families. Lack of capital was considered as the major impediment to their business growth. A high percentage of the rural women entrepreneurs were not aware of government units providing support or other forms of services available to small enterprises like them.

The rural women entrepeneurs viewed women as better business people than men contending that women possessed qualities favorable to business. They were moderate risk-takers, "imitative" types of entrepreneurs, and democratic in their styles of business management. (Author's abstract)

**Keywords:** Education, Women in development, Rural employment, Women in business, Women entreprenuership, Businesswomen, Women change agents, Women and poverty, Women business managers, Women vendors, Women and economy

NRCP Research Journal, Volume No. Issue No., 137-216 (Filipiniana Analytics) Fil(S) Q179.9 N323 v.5 1998

# ENGINEERING

0281

# Assessment of renewable energy resource potential and application for decentralized rural electrification using geographic information system (GIS) Opiso, Earl M., Kumar, Sivanappan

One consequence of massive economic development across the globe since the industrial revolution is the depletion of fossil fuel and global climate change. Countries increase its energy demand to sustain their economic growth. However, this relationship between energy demand and economic growth greatly affects our environment. It is already a given fact that fossil fuels will eventually run out, thus the move towards alternative sources of energy which are renewable and at the same time eco-friendly.

This study evaluates solar and biomass energy sources in Bukidnon, a province located at the southern part of thePhilippines, by means of analyzing the theoretical and the technical potential of these renewable sources of energyusinggeographicinformationsystem(GIS).

Various scenario analyses were also carried out to show the effects of different financial parameters (initial costs, operations and maintenance cost and electricity export rate) to the renewable energy systems financial viability using RETScreen software.

Results show that Bukidnon has an estimated technical solar energy potential of 55 MW power plant capacities that could be added to the grid and 69 MW of installed capacity power plant can be set-up from the technical potential of agricultural crops.

In conclusion, the study was able to provide a GIS-based support system for the government in the formulation of policies and strategies with regards to finding interested investors that could develop a suitable site for renewable energy system in the province and thus, could help avert future energy crisis and at the same time reduce GHG emissions. (Author's abstract)

Keywords: Engineering, Renewable energy resources, Solar energy, Biomass resource, RETScreen, GIS

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 191 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0282

**Batangas health E-center** *Hernandez, E., Anonuevo, A., Castor, J.L., Ronquillo, D.G.*  Batangas Health-e-Center (BheC) is a GSM and Web-based Telehealth System for Chronic Disease Management. The system will use set of medical devices to obtain vital sign information from participating patients. The data then will be transferred and stored in a dedicated LAMP server via internet. The server through its database stores important patient information and test results. Aside from being viewed from the internet, BHeC contains some innovations compare to previous telehealth systems. These advances include the capability of the health care provider to set goals and control limits to assist the patients in monitoring their condition, to set medical prescription with its dosage and frequency of intake. Aside from these, the system is equipped with GSM Network Interface to provide the registered health care provider with anywhere and anytime alert (SMS format) when an abnormal condition has been monitored by the system thus offering an opportunity of early intervention at critical condition. (Author's abstract)

Keywords: Engineering, Telehealth, Lamp, GSM, Early intervention

Proceedings of the 4th annual research awards 2011 (ARAW 2011), March 25, 2011, Bulwagang Balagtas, Polytechnic University of the Philippines, Manila, Volume No. Issue No., 94-101 (Filipiniana Analytics) Fil(B) TA160.6.P4 P65 2011

# A bi-level multi-period optimization model for multiple feedstock bioenergy supply chains Barilea, Ivan Dale U., Tan, Raymond R.

This paper present a bi-level optimization model for bioenergy supply chains that integrates a multiple-feedstock, multi-period framework for determining the best trajectories of such systems with time. The resulting model gives a more accurate interpretation of the different scenarios that could face real world energy systems. The upper level decision maker, the government, seeks to maximize the total amount of bioenergy that is produced by setting the appropriate desired range of production; whereas the lower level decision maker, the bioenergy producers, strives to maximize its profit, while subject to the economic and environmental limits imposed by the government. This interaction results in a Stackelberg game which is equivalent to a bi-level programming problem. Inclusion of a multi-period approach allows the growth and development of the different bioenergy sources to be specified for a fixed time horizon from the perspective of multiple decision makers. This approach can pave the way to obtain a rational prediction and allow for the optimization of resources being consumed, which can increase public awareness and assist decision makers in choosing the best path to choose. A numerical case study are used to assess the effects of key system parameters on the growth trajectories of the bioenergy systems and key policy implications of the results are discussed. (Author's abstract)

Keywords: Engineering, Energy planning, Bi-level optimization, Sustainability, Importation, Bioenergy system, Stackelberg game

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 192 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0284

Characteristics of Pangasinan zeolite as a molecular sieve for bioethanol Franco, Samuel S., Virtudazo, Raymond V.R., Galut, Christopher D.

This study was conducted to determine the physical and chemical characteristics of Pangasinan zeolite clay. The physical property includes moisture content, specific gravity, raw streak color and fired streak color, particle size distribution (PSD) and water of plasticity. The moisture content of zeolite clay sample had an average of 10.53%, specific gravity of raw powder zeolite clay had a value of 1.92 while the fired material at 1000°C has 1.84 which lower compared to the natural zeolite which was clay had а range of 2.1 - 2.4.

The powder color was determined by the munsell color chart and the uncalcined raw color was pale yellow. The calcined material at 1000°C was red. The Pangasinan zeolite clay had at most an approximately 0.149mm particles, and the PSD analysis exhibits the highest percent retained in sieve No.100 (150µm) which has a nominal sieve (149µm) 0.149 and it water of plasticity of 57.05%. opening of mm has а

Chemical and mineral structural characterization of local zeolite clay was investigated through wet method and X-ray diffraction (Siemens X-ray Gen with Phillips Goniometer). Chemical analysis of local zeolite clay compared to the analysis of natural zeolite was found out that some of the weighted percentage compositions were different. The alumina  $(A1_2O_3)$  with 12.26% and silica  $(SiO_2)$  with 73% were almost the same to the commercial zeolite. The nature difference was due to the of deposit and preparation of the sample.

In the XRD patterns of Pangasinan zeolite clay, the beneficiated raw beneficiated calcined at  $600^{\circ}$ C, and raw calcined  $1000^{\circ}$ C revealed the presence of clinoptilolite (Na,K,Ca)<sub>2-3</sub>(A1,Si)<sub>2</sub>Si<sub>13</sub>O<sub>36</sub>.12(H<sub>2</sub>O) as major components. The zeolite also contained tridymite, alpha cristobalite, and alpha quartz.

The material was formed as a molecular sieve to dehydrate hydrous bioethanol from sweet sorghum and the result showed that anhydrous ethanol was obtained with a purity of 99.4% (Author's abstract)

Keywords: Engineering, Alpha cristobalite, Alpha quartz, Bioethanol, Clinoptilolite, Molecular sieve, Tridymite, Zeolite

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 129-130 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0285

# Design and development of smart karwats: a GSM based car security system with GPS tracking capability

Abes, E., Barcelos, A., Bautista, L., Lim, S., Amante, A.

The research study entitled "Design and Development of a GSM-Based Car Security System with GPS Tracking Capability" provides a reliable security for vehicles .( The proposed system is integrated by adding GSM and GPS modules to the existing car alarm system. The existing car alarm system works by activating the siren of the vehicle when one of the car sensors is triggered. With the aid of GSM module, the proposed system provides additional control for the operation of the existing car alarm system. Using the GPS Module, the security system is beneficial to the car owners because they can conveniently monitor their car even if it is unmanned via cellular phone. In effect, this is a very robust and reliable anti-theft or "car nap" tool. The car owner can be informed if the car engine has been started by an unauthorized person or if the car has been on the move. At the same time, the security system is capable of providing the owner the exact location of the car and an option to disable and enable the engine of the car. The applicability of the system to car security application was found viable. The system as a whole was developed based on the felt need of the car owners. (Author's abstract)

Keywords: Engineering, Existing car alarm system, Security, Control, Monitor

Proceedings of the 4th annual research awards 2011 (ARAW 2011), March 25, 2011, Bulwagang Balagtas, Polytechnic University of the Philippines, Manila, Volume No. Issue No. , 76-82 (Filipiniana Analytics) Fil(B) TA160.6.P4 P65 2011

# Development of electronically controlled environment for the fast decomposition of organic fertilizer

## Magallanes, M., Ronquillo, J., Tarriela, A.D., Valarao, X.C., Publico, A.

Philippines is known as an agricultural country. It has a total land area of approximately 30M hectares. About 57 percent is forest and 43 percent is alienable and disposable. There are 13,876,959 hectares that are devoted to agriculture and about 9.8M hectares are planted to food crops. The agricultural sector in the Philippines accounts for 14% of the GDP and involves 36% of the total labour force (CIA, 2007). Bulacan, one of the 7 provinces of Central Luzon, produces most of the country's rice supply and other crops. The rural areas of the province still mostly depend on agriculture (in the plains) as a source of income. Profitable production and distribution of goods and services to meet the needs of the society is the primary concern of every farmer. To accomplish this purpose, it involves the coordination of several functions, such as the production, sales and the quality. Production of different crops is never easy. Farmers undergo to different processes in order to come up with a good quality crops. Fertilizers play an essential part in farming. These are soil amendments applied to promote plant growth. It can be either organic

(e.g. manure) or inorganic (mined or synthesized chemically). (Author's abstract)

Keywords: Organic fertilizer, Engineering, Inorganic fertilizer, Synthesized chemically, Manure

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### 0287

# Development of feature set, classification implementation and applications for vowel migration/modification in Sung Filipino (Tagalog) texts and perceived intelligibility *Bustos, Virginia B., Dela Cruz, Triah Joyce G., Acoymo, Ramon Maria G., Guevara, Rowena Cristina L.*

With the emergence of research on real-time visual feedback to supplement vocal pedagogy, the utilization of technology in the world of music is now seen to accelerate skills learning and enhance cognitive development. The researchers of this project aim to further analyze vowel intelligibility and develop software applications intended to be used not only by professional singers but also by individuals who wish to improve their singing capability.

Data in the form of sung vowels and song pieces were obtained from 46 singers. A Listening Test was then conducted on these samples to obtain the ground truth for vowel classification based on human perception. Simulation of the human auditory perception of sung Filipino vowels was performed using formant frequencies and Mel-frequency cepstral coefficients as feature vector inputs to a two-stage Discriminant Analysis classifier. The resulted over-all setup in Training Set accuracy of 89.4% an and an over-all Test Set accuracy of 90.9%. The accuracy of the classifier, measured in terms of the correspondence of vowel classifications obtained from the classifier with the results of the Listening Test, reached 92.3%. Using information obtained from the classifier, offline and online/real-time software applications were developed.

The main application features include the display of the spectral envelope and spectrogram, pitch and vibrato analysis and direct feedback on the classification of the sung vowel. These features were recommended by singers who were surveyed and were incorporated in the applications to aid singers to adjust formant locations, directly determine listener 's perception of sung vowels, perform modeling effectively and carry out vowel migration. (Author's abstract)

Keywords: Engineering, Filipino, Vowel migration, Intelligibility

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 21 Issue No. 2, 13-24 (Filipiniana Analytics) Fil(S) Q1.A3 S4 21/2 2009

### **Eco-stairs**

### Jumao-as, R. R. D., Parohinog, Jr., C. K., Secretario, R., Rolluqui, G. V.

The project, Eco-Stairs, is conceptualized to be used in places where the stairs are often used by many people, an example of which is the pedestrian footbridge. It is a usual problem that these footbridges lack proper lighting and pose danger to pedestrians. However, lighting in these places will cost much of lights will be tum on during night time. Electricity for the lights can be generated by the mechanical force collected from the steps of those who go up and down the stairs. Electric source will be a battery that will be charge from the converted mechanical force. The device detects if light is needed in the place where the stair is located and will be put on when people approach the staircase. The light is battery operated which is charged while the stairs are being used; the steps are converted to Thus, electricity that charges the battery. this device conserves energy and at the same time makes use of renewable energy. A prototype was built for testing the project. A 12-volt battery is charge by the collected mechanical force on the stairs by the footsteps of those going up and down the stairs. Also if the stairs will collect more energy, it will automatically switch to charge another stand-by battery. The Stairs was tested and evaluated by prospective users and experts and proven to be functional. (Author's abstract)

Keywords: Engineering, Economy, Footbridge, Renewable, Energy, Conversion

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0289

# The effect of deposition time on textured magnesium diboride thick films fabricated by electrophoretic deposition *Mutia, W. G., Romano, M. S., Sarmago, R. V.*

 $MgB_2$  powders suspended in ethanol were electrophoretically deposited on high-purity molybdenum substrates having dimensions of 1 x 0.3 x 0.01 cm. The said substrate was set as the cathode and was placed 0.5 cm away from

a graphite rod anode. A current density of ~ $0.02 \text{ mA/cm}^2$  and a voltage of 600 V were applied. The effect of deposition time was studied by varying it as follows: 15 s, 30 s, 1 min, and 2 min. Heat treatment at 950°C for 3 h was done after deposition. MgB<sub>2</sub> thick films were successfully fabricated for the deposition carried out for 2 min. Deposition times less than 2 min resulted in insufficient deposited powder; hence formation of MgB<sub>2</sub> was not facilitated. Films deposited at 15 and 30 s have good surface characteristics, wherein no microcracks were present. X-ray diffraction and surface image analysis reveal that the deposited films have a preferred orientation along the (101) direction. (Author's abstract)

Keywords: Engineering, Molybdenum substrates, MgB2, Ethanol, X-ray diffraction, Density, Voltage

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 79-83 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

0290

# Effects of antioxidant extracted from leaves of "banaba" (*Lagerstroemia speciosa, L.*), mangosteen (*Garcinia mangostana, L.*) and "tsaang gubat" (*Ehretia microphylla L.*) on the oxidation stability of biodiesel

Movillon, Jovita L., Demafelis, Rex B., Bautista, Ramer P., Lacsa, Marinella C., Viray, Donna Marie C., Cordova, Karel J.

The stability of biodiesel is relatively inferior to petrodiesel due to its unsaturated fatty acids which may lead to the formation of gums. In the presence of air or oxygen, alcohol and acid may be produced which can reduce the flash point and increase the total acid number, thus causing damage to the engines. The effects of the antioxidant extract from "banaba" (*Lagerstroemia speciosa, L.*), mangosteen (*Garcinia mangostana,L*) and "tsaang gubat" (*Ehretia microphylla* L.) on the oxidative stability of biodiesel from *Jatropha curcas*, L. were determined based on the induction period (IP) of the samples using the Rancimat method of oil stability index. The data obtained for the "banaba", mangosteen and "tsaang gubat extracts had regression coefficients (R<sup>2</sup>) of 0.687, 0.804 and 0.886, respectively, indicating a linear positive correlation between the loading rates (mg total polyphenol in the extracts /L biodiesel; ppm) and the IP (hours). To meet the European standard of 6-hour IP, the loading rates (g antioxidants per 100 L biodiesel) were found to be: 983.4, 110.9, 1124.9, and 206.3 for "banaba", mangosteen, 'tsaang gubat" and the commercial antioxidant respectively. The antioxidant extract from mangosteen leaves had actual loading rate of 260.4 g/100L, with induction period of 17.52 hours, greatly exceeding the American, European and Japanese standards. (**Author's abstract**)

Keywords: Engineering, Antioxidant, Banaba, Mangosteen, Tsaang gubat, Biodiesel, Jatropha curcas

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 189 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0291

Effects of noise coherence on stochastic resonance enhancement in a bithreshold system Litong, Marisciel, Hayakawa, Yoshinori, Sawada, Yasuji We report a method of enhancing stochastic resonance (SR) that uses coherent noise in a symmetric bithreshold device. Coherent and non-coherent noise types are used to show that this method is feasible. The detection performance of the system is quantified based on the strength of the signal frequency in the power spectrum. We introduce a normalization condition of the different noise types so as to allow comparison of the results. (Author's abstract)

Keywords: Engineering, Bithreshold system, Stochastic resonance (SR), Coherent, Non-coherent

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 13 Issue No. 2, 67-70 (Filipiniana Analytics) Fil(S) Q1.A3 S4 13/2 2001

## 0292

# Elastic-plastic analysis of underground openings by the finite element method *Reyes, Salvador F., Deere, Don U.*

А method of analyzing stress concentrations and displacements around cavities of developed, the plasticity of the material arbitrary shape was wherein was assumed to be governed by parameters analogous to angle of internal friction and cohesion. The yield function plots as a cone in principal space; the stress-strain relations stress were obtained by regarding the function а plastic potential. The displacement method as of finite element analysis (with triangular elements and linear displacement functions) was employed in a step by step application of load. At each step, increments of displacement which satisfy equilibrium were determined by a recursive process. Stress concentrations around circular openings in an infinite medium were analyzed for arbitrary values of yield parameters and initial state of stress. Results appear to be fairly realistic and reflect the effects of volumetric expansion accompanying yielding, as implied by the stress-strain relations used. (Author's summary)

Keywords: Engineering, Elastic-plastic, Displacement method, Linear displacement functions, Equilibrium

Philippine Engineering Journal, Volume No. 31 Issue No. 1, 477-485 (Filipiniana Analytics) Fil(S) TA4 P532 31/1 2010

0293

# **Ethanol fermentation under vacuum pressure** Nguyen, Viet D., Auresenia, Joseph, Kosuge, Hitoshi, Tan, Raymond, Brondial, Yolanda

A kinetic model for ethanol fermentation process was developed to investigate the effects of high glucose concentration on the growth rate and production rate of a baker's yeast, *Saccharomyces cerevisiae*. The model was built from the batch experimental data and validated by a continuous fermentation experiment. A high glucose concentration led to a decrease in the growth and production rates. The maximum ethanol concentration obtained from batch fermentation was 15.8% (v/v) within 72 hours. All parameters were determined as function of merely initial glucose concentration, when fermentation temperature was kept constant. The results indicated that the fermentation process can be generally described by reducing sugar concentration variable. (Author's abstract)

Keywords: Engineering, Kinetic model, Ethanol fermentation, Hign glucose concentration, Baker's yeast

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 130 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0294

# Fabrication and characterization of spin-assisted and dip-coated PEDOT:PSS and poly(diallydimethylammonium chloride) nanofilms for organic light-emitting diode *Quesada, Maria Gabriela B., Binag, Christina A.*

Organic light emitting diodes (OLED) have extended its domain of applications in the area of flat panel displays due to their potential properties, brightness efficiency, extended lifetime and low production cost. The study aims to prepare and characterize nanofilms of Poly (3,4-ethylenedioxythiophene):Poly (styrenesulfonate) (PEDOT:PSS) and Poly (diallyldimethylammonium chloride) (PDADMAC) for the fabrication of an OLED.

EDOT:PSS was chemically polymerized using  $(NH_4)_2S_2O_8$  oxidant and FeC1<sub>3</sub> catalyst. Absorbances of different solutions of synthesized PEDOT:PSS were determined using a UV-visible spectrophotometer. The glass slides and ITO-coated slides (10x20 mm) substrates were degreased and functionalized. In dip-coating, the treated substrate was then initially immersed in 0.01M PDADMAC solution for 15 min, followed by immersion in 3% (w/v) PEDOT:PSS solution. In spin-coating, PDADMAC and PEDOT:PSS were deposited alternately on the substrate with spin speed of 2500 rpm for 30 sec. The cycles for two techniques were repeated until 10 bilayers were achieved.

Each bilayer exhibited absorbance peaks at 370, 560 and 850 nm due the dark blue PEDOT. The SEM micrographs of PEDOT:PSS surfaces revealed globular structures. Atomic force micrographs showed average roughness of 1.000 nm and 14.697 nm, for spin-assisted and dip-coated films, respectively. An OLED was fabricated using PEDOT:PSS/PDADMAC films as the hole transport layer. The current-voltage graph of prepared OLED showed a diode characteristic. (Author's abstract)

Keywords: Engineering

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0295

# Greenhouse gas emissions of tobacco flue-curing process in the Philippines *Franco, Samuel S.*

The production of flue-cured tobacco is one of the major agricultural production systems in the Philippines specifically in Northwestern Luzon. It is considered high value cash crop that could offset the cost of production of food crops. The production of the crop is energy intensive especially in the flue-cuing process which is done in natural convection flue-curing barns made of different materials like concrete and galvanized iron sheets in various configurations with fuelwood as the primary source of energy.

The annual production of flue-cured tobacco for the past five decades is fluctuating between 45,000 to 75,000 tons. The amount of fuelwood to cure this volume of tobacco was determined by statistical models developed and it ranges from 157,500 to 262,500 tons per year. This volume of fuelwood was estimated to be equivalent to trees grown in 6,750 to 7,500 hectares of woodland depending on growth density.

Mathematical models were developed utilizing previous research data in establishing the greenhouse gas emission levels in relation to the different tobacco flue-curing barn configurations. The amount of carbon dioxide (CO<sub>2</sub>) and carbon monoxide (CO) emitted were obtained in the mathematical models developed at different conditions. The range of annual CO<sub>2</sub> and CO emission computed using the mathematical model are, 55,460 to 83,460 tons and 4,560 to 6,970 tons. (Author's abstract)

**Keywords:** Engineering, Carbon dioxide, Carbon monoxide, Emissions, Energy, Flue-curing, Fuelwood, Greenhouse gases, Tobacco

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0296

# Investigation of arsenate uptake by hydrotalcite at hyperalkaline and elevated temperature conditions

Opiso, Einstine M., Sato, Tsutomu

Hydrotalcite is known to retain large amounts of anionic species due to its positive charge characteristics. Hence, investigating its role for the retention of long-lived dissolved anionic nuclides during an intrusion scenario in radioactive disposal facilities is necessary.

This study examined the Mg-A1 type hydrotalcite (Mg6A12(CO3)(OH)16•4(H2O)) (Mg/A1 ratio = 2) as possible sorbent of anionic nuclide using arsenate as an analogue. The sorption experiments were carried out at alkaline pH condition (pH 11) and elevated temperature of 75°C to simulate the intrusion scenario at radioactive waste repositories. Arsenate sorption was conducted during and after hydrotalcite formation.

The results showed that hydrotalcite was able to remove more than 90 and 70% of arsenate during and after mineral formation, respectively even in the presence of competing anions. The co-precipitated arsenic was more resistant to release and showed a significant irreversible fraction of sorbed arsenate of nore than 30%, which could be attributed to the inner-sphere complexation with the Mg or A1 in the octahedral sheets by displacing their coordinated hydroxyl group and stronger interlayer fixation.

Overall, the immobilization of arsenate by hydrotalcite could possibly ensure the long term immobilization anionic nuclides. Hence, controlling the pore water chemistry of cement to ensure the significant precipitation of hydrotalcite during hydration must be considered in cementitious systems used in geological waste repositories. (Author's abstract)

Keywords: Engineering, Hydrotalcite, Arsenate, Sorption, Radioactive waste repositories, Cementitious systems

## Microbial fuel cell: a new renewable source of energy: Pasig river sediments for lighting Daisog, B., Dela Cruz, E., Salazar, A., Tisca, J., Buenavides, C.

As the international community calls for a clean and renewable source of energy due to the treat of the effect of climate change, a lot of effort had been made to find ways to develop such existing clean source of energy as well as finding a new type of renewable energy which shall sustain the energy needs of the world. Also, the economic aspect of these renewable source of energy had been taken into great concern to be a much better substitute to the existing source of energy primarily fossil fuel. And one of these types of clean energy source which at the moment still on its infancy is utilizing bacteria as source of energy now called the Microbial Fuel Cell. And in the Philippines where there is an existing energy crisis, such alternative sources of energy are very much in need today. because of the pollution the Also. in maior rivers and bodies of water in the country, this type of alternative energy shall provide a long term goal in utilizing such bodies of water which have an abundant source of bacteria making it suitable for the microbial fuel cell technology. Like the Pasig River, the major river system in metro manila which is in fact highly polluted with organic materials which make it a hugeden of different types and species of electricity producing bacteria. Because of this aspect, the group had seen that the Pasig River is not only for transportation purposes but also for providing a clean source of energy by using the bacteria mostly concentrated in its sediments. (Author's abstract)

Keywords: Engineering, Microbial fuel cell, Bacteria, Pasig river, Sediments

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0298

# Nanowire formation and polymer conformations of electropolymerized poly(3,4,ethylenedioxythiophene) (PEDOT) on iodine-modified Au(111) single crystal electrode as probed by *in-situ* STM

Lapitan, Jr., Lorico DS., Tongol, Bernard John V., Yau, Shueh-Lin

In the field of nanotechnology, there is a growing interest in the synthesis of conjugated polymer nanowires because of their promising applications in nanodevices and molecular electronics. In this study, the electrochemical polymerization of 3,4-ethylenedioxythiophene (EDOT) ( $E_{ox} = 1.20$  V) on iodine-modified Au(111) single crystal electrode in aqueous 0.10 M HC1O<sub>4</sub> was investigated by cyclic voltammetry (CV) and electrochemical scanning tunneling microscopy (EC-STM). The Au(111) single crystal electrode was fabricated using the *Clavilier's* method. The iodine adlayer was prepared by dipping a freshly annealed Au(111) single crystal electrode in a 0.10 M potassium iodide (KI) solution.

Cyclic voltammetric and EC-STM data revealed the iodine adlayer was stable from E = 0.0 - 1.40 V vs Reversible Hydrogen Electrode. This provided a suitable potential range for EDOT electropolymerization at 1.20 V vs. RHE. EC-STM was used to examine the formation of EDOT adlayer on iodine-modified Au(111) electrode). The iodine adatoms on Au(111) surface were prominent at negative potentials but EDOT molecules gradually appeared as bright spots when the potential was shifted more positively. However, the formation of an ordered adlayer of EDOT molecules was not observed. *In-situ* electropolymerization of EDOT was carried out at 1.20 V and showed the formation of single-molecular chains of PEDOT with diameter and lengths of 0.9 nm and 5-7 nm respectively. Extensive STM imaging further revealed PEDOT having bended polymer backbones of 105°, 144° and 180° (i.e. hairpin folding). The growth of PEDOT multi-layers is observed when the potential was held for a longer time. (Author's abstract)

**Keywords:** Engineering, Poly(3,4-ethylenedioxythiophene), nanowire, Iodine, Au(111) single crystal electrode, Scanning tunneling microscopy

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0299

# Optimization of *Jathropha curcas* (tubang bakod) and *Calophyllum inophyllum* (bitaog) as a viable source of activated carbon for methylene blue adsorption

# Bautista, Ricabelle H., Co, Dana Mae S., Gecain, Ma. Kristina R., Ngojo, Lailanie Angela A., Dimaano, Maria Natalia R.

Activated carbon adsorption techniques were proven successful in removing colored organics. Methylene blue is a thiazine (cationic) coloring dye. The dye causes hazards such as permanent injury to the eyes, irritation to the gastrointestinal tract with and skin and abnormalities in respiration. Furthermore, *Jatropha curcas (Tubang Bakod)* and *Calophyllum inophyllum* (Bitaog) seed kernels have been evaluated as potential alternative sources for biodiesel production. Their nutshells and seed husks are considered agricultural wastes.

In this study, locally produced activated carbon derived separately from *Jatropha curcas nutshells* and Bitaog seed husks were developed. The production involved chemical activation with Phosphoric Acid and Zinc Chloride, respectively. The optimization of carbonization conditions involved the determination of the appropriate temperature and burn off time, for effective pore size and structure. Each developed activated carbon was contacted with Methylene Blue dye for the adsorption test and then characterized by Scanning Electron Micrograph (SEM) analysis. Kinetic Model, the Langmuir Isotherm and the Freundlich Isotherm were used to analyze the adsorption capacity of the activated carbon.

The best conditions for activated carbon from *Jatropha curcas* nutshells based on the linear correlation ( $R^2$ ) were: 500°C, 240 min, and 1: 1 chemical ratio. The carbon showed pore diameter of 13.3-26.6 pm which is accessible to Methylene blue pores. The isotherm equilibrium data were well-fitted by the Langmuir model and gave a maximum adsorption capacity of 153.8 mg/g. The best parameters identified for the Bitaog activated carbon were  $850^{\circ}C$  and 6 hrs.

The resulting activated carbon from *Jatropha curcas* and Bitaog showed substantial capabilities to adsorb Methylene blue from wastewater as compared to the standard activated carbon. This could definitely aid in the removal of wastewater pollutants as well as reduce the solid wastes that could be generated from biodiesel production. (Author's abstract)

Keywords: Engineering, Activated carbon, Jathropha curcas, Tubang bakod, Calophyllum inophyllum, Bitaog

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## Physical quality characterization of milled rice using computer vision technique Peneyra, Ruel Garabiles, Cuaresma, Francisco D., Gavino, Romeo B., Aguinaldo, Teresito G.

The use of a low cost computer vision technique in physical quality characterization of milled rice was explored and developed. The technique extended the application of freeware image processing software and ordinary desktop scanner. Classification of milled rice kernel was aided by neural network (NN) and discriminant analysis (DA).

Physical quality parameters evaluated were chalky grains (%CG), head rice (%HR), broken rice (%BR), and grain shape. Characteristic dimension ratio (CDR) of the area, length and volume as determined by computer vision technique were compared using mean squared error (MSE) to the results of standard laboratory method (SLM).

Computer vision technique using CDR based on length was found effective in evaluating the %HR and %BR of both medium and long grain samples. Analysis revealed a strong relationship between the results of CDR and SLM as reflected by low MSE and high R2 values (> 0.95), defined by  $3^{rd}$  order polynomial functions. Effective classification were found using DA in medium grains and NN on long grains samples.

Chalkiness (%CG) by CDR based on length in NN resulted in the lowest MSE value of 1.95 compared to other CDR features and of higher R2 value of 0.91 as defined by an exponential function. Results on grain shape shows medium grains having length 4.76 to 5.99 mm and circularity of 0.71 to 0.82 indicating medium to bold shape. Long grains have length 5.36-7.43 mm and circularity of 0.44-0.67 indicating slender shape.

Low cost semi-automated computer vision technique for milled rice physical quality characterization can be implemented with good accuracy (>90%) in reference to SLM. The applications and potential use may be extended to agencies and people working on grain quality inspection, milling and retailing. (Author's abstract)

**Keywords:** Engineering, Rice milling, Neural network, Computer vision, Discriminant analysis, Characteristic dimension ratio

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 135-136 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0301

# Preliminary investigation of *Calophyllum inophyllum* (Bitaog) as a potential source of biofuel

# Antonio, Juan Paulo M., Fabros, Alden Ferdinand, Mendiola, April Shower M., Dimaano, Maria Natalia R.

In support to the Philippine's thrust of sustaining the supply of fuel while maintaining a steady food supply, a non-edible forest crop was examined for biodiesel production. Our study focused on the investigation of *Calophyllum Inophyllum* (Bitaog) oil as a potential biodiesel source. It aimed at determining the optimum transesterification time and methoxide concentration, the chemical composition of the Bitaog Methyl Ester and the fuel characteristics compared to the petroleum-based diesel and accepted biodiesel in the Philippines based on national

Bitaog is a tropical tree that is abundant in the Philippines. Mature Bitaog fruits from Zambales were dried, decorticated, grinded, immersed in n-Hexane and percolated for oil extraction. Transesterification proceeded by preheating the oil at 70°C. Varying concentrations of methoxide solution composed of methanol and sodium hydroxide, as catalyst, was added to the oil in each transesterification with 10% excess methanol The solution was allowed to settle followed bv separation of the Bitaog Methyl Ester (BME) subsequent and washings.

About 40% of oil yield was obtained from the Bitaog oil extraction. Transesterification proceeded for two hours at 65 - 75°C with optimum 0.85M methoxide concentration. The GCMS analysis of the transesterified oil indicated that Methyl Oleate and Methyl Linolelaidate are the most dominant fatty acids with 24.20% and 44.98% abundances, respectively. BME slightly exceeded the PNS limit by 0.11 cS for kinematic viscosity. Subsequent analyses may be carried out on BME in blended forms. The 220C flash point indicated that BME has less tendency to forming flammable mixtures at low temperature which proves to be safer to handle as compared to diesel fuel and CME. BME presents a source of biodiesel that assures compatibility with the emission standards preventing the wear of the fuel system and internal engine components, a cleaner biodiesel, with lesser corrosion on metallic alloys. (Author's abstract)

Keywords: Engineering, Bitaog, Fatty Acid Methyl Ester (FAME), Biofuel, Transesterification

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#### 0302

# Preparation and investigation of spin self assembled multilayer film of poly(3,4 ethylenedioxythiophene): poly(4 styrenesulfonate) and poly(alylamine hydrochloride) as organic light-emitting diode

Lapinid, Ezra Abigail C., Binag, Christina A.

The preparation and characterization of thin-film materials is a dominant area of research. These films have found several applications as thin-film and field effect transistors, touch displays and electroluminescent devices such as organic light-emitting diodes. The organic light-emitting diode (OLED) has received a lot of attention because of its attractive features for display applications. This study aims to chemically prepare poly (3,4-ethylenedioxythiophene):poly (styrenesulfonate) (PEDOT:PSS) and fabricate a polymer multilayer film with poly(allylaminehydrochloride) (PAH) by spin self-assembly method and to investigate the properties of the multilayer film as OLED.

EDOT was polymerized with PSS using FeC1<sub>3</sub> oxidant with several monomer to oxidant molar ratios (1:1, 1:2.5, 1:5, 1:7.5), with the 1:7.5 ratio giving the highest yield of polymer. The optical absorptions of several PEDOT:PSS solutions (0.05, 1, 3 and 5% w/v) showed 3% w/v with the highest and most stable reading with absorption peaks at 325 nm and 750 indicative of PSS and 990 nm for the blue-colored PEDOT. The PAH/PEDOT:PSS solution was spin-coated (2500 rpm for 30s) to form a film on glass slide and indium tin oxide substrates (1.0 x 2.5 cm). The film coating with a total of 15 bilayers showed an increasing absorbance as bilayer increases. SEM and AFM micrographs of PEDOT:PSS showed relatively smooth surface The OLED characteristic of the multilayer film gave a current-voltage curve of a diode even if no light was emitted. (Author's abstract)

Keywords: Engineering, OLED, PEDOT, LBL films, Spin self-assembly, AFM, SEM

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 148 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

## Reducing fossil fuel emission using treadle pump technology dela Cruz, Roy Searca Jose P., Espino, Jr., Armando N.

The impact of treadle pump technology in reducing the fossil fuel emission coming from agricultural sources was assessed. Specifically, the study estimates the amount of carbon dioxide  $(CO_2)$  emission that can be reduced by using treadle pump technology and determines the appropriateness of the technology.

Estimating the fossil fuel emission followed the "bottom up" approach as recommended by the Intergovernmental Panel on Climate Change.

The appropriateness of the technology was determined by evaluating the pump's capacity to irrigate farms. Acceptability to farmers was assessed and farmer perceptions on the impact of treadle pump on vegetable production were gathered using a questionnaire.

Estimating the fossil fuel emission from vegetable production in Nueva Ecija revealed that it could contribute from 327 to 654 metric tons of  $CO_2$ , This can be reduced by a treadle pump by 81.82 to 490.89 metric tons per year.

The treadle pump is appropriate for small plots of lands. Water source can be creeks, ponds, etc. and in open wells with depth up to 5 meters. Marginalized farmers can use the pump because of its low initial, operational and maintenance cost. Treadle pump can be used in areas where grid electricity and source of fuel are difficult to find. (Author's abstract)

**Keywords:** Engineering, Treadle pump, Pressurized treadle pump, Human powered pump, Alternative pump technology, Fossil fuel emission, CO2 emission

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## 0304

# The reduction Behavior of nickel in high-iron laterites under CO/CO<sub>2</sub>/N<sub>2</sub> atmospheres *Golecruz, R. B., Mena, M. G.*

The reduction behavior of nickel in high-iron Nonoc laterite was studied by varying the reduction temperature, reaction time and gas composition. It was observed that over a wide range of conditions, the degree of metallization increases with increasing level of any process variable, reaches some peak values, and then decreases with further increase in severity of reduction conditions. It was also noted that no more than 96.6% nickel can be metallized from the test sample. Ammoniacal leaching of pre-reduced pellets demonstrated that the Nonoc laterite is responsive to the treatment. An overall nickel recovery of about 94% is possible with this process. (Author's abstract)

Keywords: Engineering, Nickel, High-iron Nonoc laterite, Temperature, Gas composition

Philippine Engineering Journal, Volume No. 31 Issue No. 1, 89-98 (Filipiniana Analytics) Fil(S) TA4 P532 31/1 2010

# A research on the production of bonded particle board utilizing sugarcane bagasse *Castulo, Rodierick, Garcia, Christian Benedict R., Magistrado, Virna Liza L., Sawal, Leonardo C.*

Particle board has been used widely in the furniture industry. The production of particle board from sugarcane bagasse is to reduce the waste of bagasse. The study used the sugarcane bagasse with a Urea-Formaldehyde (UF) Tesin and undergo a hot compression machine to form a particle board. The research parameters used ratio of binder and several testing methods for particle board such as moduIus of rupture (flexural strength), faced screw holding, internal bond, thickness swelling and water absorption. The result compared with the conventional particle board and existing parameters for partial board. The aim of the study is to introduce the utilization of bagasse and using eco-materials as substitute material for partial board. (Author's abstract)

**Keywords:** Engineering, Sugarcane bagasse, Urea-Formaldehyde (UF) resin, Particle board, Flexural strength, Faced screw, Water absorption

Proceedings of the 4th annual research awards 2011 (ARAW 2011), March 25, 2011, Bulwagang Balagtas, Polytechnic University of the Philippines, Manila, Volume No. Issue No. , 65-74 (Filipiniana Analytics) Fil(B) TA160.6.P4 P65 2011

0306

### Rice husk ash as soil stabilizer

# Balatucan, Archien, Cambel, Jenin, Galigao, Jr., Ronnie, Matining, Eric, Viagedor, Ruel, Bantayan, Bryan

Soil stabilization refers to the process of changing soil properties to improve strength and durability. There are many techniques for soil stabilization, including compaction, dewatering and by adding material to the soil. Nowadays, Engineers determine which form of soil stabilization is the best solution for a specific soil problem. If this is the case with your soil, stabilizers applied to improve your soil quickly and economically. The primary beneficial effect of the rice husk ash is on their physical properties of soil. Rice Husk Ash has pozzolanic properties of amorphous silica. The proponents recognized the value of soil stabilization and the need for a high quality stabilizing agent, the use of rice husk ash as an alternative soil stabilizer. This research study presents experimental results for stabilization of clay soil by using rice husk ash, as replacement to the conventional stabilizer and the significant of it is to improve the strength capacity of the soil. The important of this research study is to help the urban communities regarding soil problem. The proponents utilized on clay soil from Diliman, Quezon City, Metro Manila these were gathered at the proponents residing place. Through extensive research, the proponents came up with the ratio for rice husk ash : 5% RHA, 10% RHA, 15% RHA, and 20%. Each of the mix proportions undergo in Sieve Analysis, Liquid Limit (LL), Plastic Limit (PL), Moisture Density Relation (MDR) and California Bearing Ratio (CBR) test. The best mix proportion for soil in terms of swell percentage and strength capacity of soil are 15% RHA. This research suggested conduct further study to satisfy if rice husk ash is workable to mixed to different types of clay soil. (Author's abstract)

Keywords: Engineering, Soil stabilizer, Rice husk ash, Compaction, Dewatering

Proceedings of the 4th annual research awards 2011 (ARAW 2011), March 25, 2011, Bulwagang Balagtas, Polytechnic University of the Philippines, Manila, Volume No. Issue No. , 26-34 (Filipiniana Analytics) Fil(B) TA160.6.P4 P65 2011

# Speech recognition controller for motorized wheelchair

Gagarin, M. A., Hugo, E., Libiran, R., Lontoc, D.

Speech Recognition Controller is a wireless device designed to help those person with serious disability in terms of mobility in using a motorized wheelchair. Apparently, the motorized wheelchair used in this project has a built in joystick controller. There were five (5) voice commands that can be recognized by the device such as forward, backward, tum left, tum right and stop. As the user speaks through the microphone, the voice command will be converted from analog signal to digital signal by the HM2007 chip. The digitalized signal goes through the PIC 16f877 A microcontroller. The microcontroller will compare the incoming voice signal with the preprogrammed commands. When the signal has been verified and it successfully matched with one of ilie commands on the microcontroll er, the signal will be send in the RF transmitter. With this, the persons with disability (PWD) can maneuver the motorized wheelchair on his wireless own. This device can be attached to an existing motorized or powered wheelchair with proper installation. (Author's abstract)

Keywords: Engineering, Speech recognition, Motorized wheelchair, HM2007, RF transmitter

Proceedings of the 4th annual research awards 2011 (ARAW 2011), March 25, 2011, Bulwagang Balagtas, Polytechnic University of the Philippines, Manila, Volume No. Issue No. , 87-93 (Filipiniana Analytics) Fil(B) TA160.6.P4 P65 2011

0308

# Structure and mechanical property of MgO-ZrO<sub>2</sub> ceramic doped with CeO<sub>2</sub> Bognalbal, Eufrecina B., Amorsolo, Jr., Alberto V.

Zirconia-based ceramics are examples of advanced ceramic materials with superior mechanical properties such as hardness and fracture toughness. The structure and properties of pure zirconia can be modified by addition of certain dopants such as MgO and CeO<sub>2</sub>. This study, which was intended to lower the fabrication temperature of zirconia-based ceramic, investigated the effect on the structure and hardness of MgO-ZrO<sub>2</sub> ceramic by doping with CeO<sub>2</sub> and sintering at relatively lower temperatures.

MgO-ZrO<sub>2</sub> ceramic containing 90.3% mole  $ZrO_2$  and 9.7% mole MgO was doped with CeO<sub>2</sub> ranging from 0 % to 24% mole and sintered at 1300°C, 1400°C and 1500°C for varying times of 1 hour to 6 hours following a factorial experimental design. Four levels of composition and three levels of sintering time were used in the experiment.

Results of X-ray diffraction (XRD) analysis of sintered samples showed that the structure of  $ZrO_2$  phases formed were dependent on composition and temperature but independent of time. Cubic zirconia was observed to be the dominant phase at 1500°C for all compositions while the monoclinic phase was present in compositions containing less than 12% mole CeO<sub>2</sub> at all temperatures. The amount of tetragonal phase was highest in samples containing 12% mole CeO<sub>2</sub> sintered at 1300°C. The hardness measured by Vickers indentation technique was found to increase linearly with the square root of CeO<sub>2</sub> concentration at compositions less than 12% mole CeO<sub>2</sub>. This same property decreased with CeO<sub>2</sub> content at compositions above 12% mole CeO<sub>2</sub>. The highest hardness value was obtained in single-phase cubic zirconia containing 12% mole CeO<sub>2</sub> sintered at 1500°C. Results obtained in this study were comparable with reports in the literature sintered at much high temperatures, indicating the possibility of reducing the fabrication temperature of MgO-ZrO<sub>2</sub> binary ceramic by doping with CeO<sub>2</sub>. (Author's abstract)

**Keywords:** Engineering, Ceramic, Doping, Zirconia, Magnesia, Ceria, Mechanical, Hardness, Properties, Structure, Phase, Sintering

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 127 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

# Surface molecular aggregation states of monodisperse and polydisperse polystyrene films on scanning force microscope *Kajiyama, Tisato*

Forced modulation scanning force microscopic (SFM) and lateral force microscopic (LFM) measurements of the monodisperse polystyrene (PS) films were carried out at 293K in order to reveal surface molecular motion. Surface dynamic storage modulus, E', and surface loss tangent, tan  $\delta$ , of the monodisperse PS films were evaluated on the basis of forced modulation SFM measurement. It was revealed that the magnitudes of surface E' and surface tan  $\delta$ were lower and higher than those for its bulk state, respectively, in the case of the number-average molecular weight  $(M_n)$  lower than 26.6k. Based on forced modulation SFM measurements, the surface of the PS film with Mn lower than 26.6k was in a glass-rubber transition state or a rubbery state even at 293K, in spite of that the bulk  $T_g$  was for above 293K. The active thermal molecular motion on the polymeric surface was explained by the excess free volume induced by the surface localization of chain end groups. The surface enrichment of chain end groups was confirmed secondary spectroscopic by dynamic ion mass measurement.

When the molecular weight distribution of polydisperse PS was broad and a somewhat lower molecular weight component was mixed, the active surface molecular motion of the polydisperse PS film a corresponding to a glass-rubber transition state, was remarkably depressed at room temperature in comparison with the case for the monodisperse PS film with the corresponding  $M_n$ s. The difference on the surface thermal molecular motion between monodisperse and polydisperse PS films might be explained on the basis of the chemical structure of the chain end groups. (Author's abstract)

**Keywords:** Engineering, Scanning force microscopic (SfM), Lateral force microscopic (LFM), Molecular weight (Mu), Polystyrene (PS)

Advance Polymers for the 21st Century: proceedings of the DOST-JSPS workshop on materials and polymer chemistry, Volume No. Issue No. , 75-80 (Filipiniana Analytics) Fil(B) QD380 A95 1998

# Synthesis and characterization of cordierite prepared from mixtures of Philippine Kaolinite Clay, Talc, and other additives Pondoc, Dionesio C., Mendoza, Herman D.

Imported commercial kaolin clay, talc powder and light magnesium carbonate were used to synthesize cordierite body, based from the stoichiometric composition of 2MgO.2A1<sub>2</sub>O<sub>3</sub>.5SiO<sub>2</sub>, as control mixture by solid state sintering process. Philippine kaolinite clay and talc mineral rock, both from the province of Ilocos Norte were used to substitute the imported commercial materials in the following mixture ratios of 90:10, 80:20, and 70:30. Test specimens in the form of pelletized circular disks of 20 mm diameter by 2.5 mm thickness were prepared from the mixtures by powder pressing in a stainless metal mold using hydraulic press with a pressing load of 80-100 MPa. The pellets were sintered at the temperature range of 1000°C-1200°C for two and three hours in an electric furnace.

The effects of mixture ratio, sintering temperature and sintering time to the bulk density, apparent porosity, linear shrinkage and compressive strength of the synthetic cordierite were determined by conducting full factorial experiment. Results in the characterization of synthesized cordierite body using x-ray diffraction (XRD) analysis revealed the formation of  $\mu$ -cordierite and  $\alpha$ -cordierite in all test specimens of the three mixture ratios sintered at 1000°C within the sintering time of two and three hours. At 1100°C, the diffraction peaks detected were mostly formation of  $\alpha$ -cordierite as the major crystalline phase with the presence of small amount of  $\mu$ -cordierite and spinel. SEM characterization analyses show that the microstructures were transformed from uniformly euhedral particles range of 1-10 /lm) spherical (size to particles as the sintering temperature increases from 1000°C to 1200°C. Open pores between spherical particles can distinguished. also he

Results of the full factorial experiment indicate that as the amount of substitution oflocal materials increased in the stoichiometric composition of cordierite using 100% imported materials, bulk density and linear shrinkage increased with a linear relationship having a positive slope, while apparent porosity decreased having a negative slope in all test specimens within the sintering temperature range of 1000°C-1200°C and sintering time of 2 and 3 hours. Compressive strength increased as the bulk density of the test specimen of synthetic cordierite increased. The maximum compressive strength of the synthetic cordierite test specimen was determined to more than 2,000 psi. (Author's abstract)

Keywords: Engineering, Synthesis, Cordierite, Solid state sintering

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 128-129 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

# A tilt, soil moisture, and pore water pressure sensor system for slope monitoring applications

# de Dios, Rosanno JC, Victorino, Francis Gabriel, Mendoza, Earl Anthony, Talampas, Marc Caesar, Marciano, Jr., Joel Joseph S.

This paper describes the design, implementation and characterization of a sensor network intended for monitoring of slope deformation and potential failures. The sensor network system consists of a tilt and moisture sensor column, a pore water pressure sensor column and a personal computer for data storage and processing. The tilt sensor column consists of several pipe segments containing tri-axial accelerometers and signal processing electronics. Each segment is joined together by flexible joints to allow for the column to deform and subsequently track underground movement. Capacitive-type sensors for soil moisture measurement are also included in the sensor column, which are used to measure the soil moisture at different depths. The measurements at each segment are transferred via a Controller Area Network (CAN) bus, where the CAN master node is located at the top of the column above ground. The CAN master node transmits the collected data from the slave nodes via a wireless connection to a personal computer that performs data storage, processing and display via a Python based graphical user interface (GUI). The entire system was deployed and characterized on a small scale slope model. Slope failure was induced via water seepage and the system was demonstrated to ably measure the inclination and soil moisture content throughout the landslide event. (Author's abstract)

Keywords: Engineering, Sensor networks, Slope monitoring, Landslide early warning systems, Wireless networks

# **ENVIRONMENTAL SCIENCE**

# The avifauna of Mt. Haponhaponon, Mantikil, Siaton, Negros Oriental: with notes on other vertebrates Bucol, Abner A.

Preliminary results on the surveys of the vertebrate fauna of Mt. Haponhaponon are presented. A total of 91 species of birds are known in the Mantikil are, 84 species of which are confirmed by this study. Some of the birds confirmed are of conservation interest. A few mammalian, reptilian and amphibian fauna were also noted. Continued clearing of the forest for agriculture is the prevalent threat to these resources. Immediate conservation measures are thus needed to protect the forest from degradation. (Author's abstract)

Keywords: Environmental science, Avifauna, Ornithology, Vertebrates, Negros, Endemic threatened species

Silliman Journal, Volume No. 50 Issue No. 1, 53-64 (Filipiniana Analytics) Fil(S) AS538 S46 50/1 2009

0313

# **Development and production of Mt. Pinatubo ash artwares** Bedia, E. L., Ladines, N. B., Paglicawan, M. A., Monsada, A. M.

The development of Mt. Pinatubo ash artwares utilizing largely volcanic ash and unsaturated polyester as the polymer matrix was successfully conducted. Raw volcanic ash was subjected to sun drying, classification and screening process. The screened ash was then mixed with the polyester resin and methyl ethyl ketone peroxide resulting to a 70-29-1 percentage by weight combination. The resultant mixture was poured in a silicone rubber mold and was allowed to harden. Results showed that the ash-polyester- methyl ethyl ketone peroxide mixture can be easily molded into various shapes and set into a hard mass. After the developmental phase was completed, test productions were conducted to find out the reproducibility of results and the economic feasibility aspect. The technology was proven to be feasible and the production of Pinatubo ashwares was transferred to Region 3. (Author's abstract)

Keywords: Environmental science, Volcanic ash, Unsaturated polyester, Drying

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 24 Issue No. 1, 65-71 (Filipiniana Analytics) Fil(S) T1 N21 24/1 1999

# Diversity and status of plants in three mountain ecosystems in Southern Mindanao, Philippines

Amoroso, Victor B., Amoroso, Cecilia B., Coritico, Fulgent P.

This paper presents the diversity and status of plants conservation initiatives in the three mountain ecosystems in Mindanao, Philippines. Representative specimen were pressed, dried, poisoned and mounted as herbarium vouchers. To determine the index of general diversity for trees, 20x20 m sampling plots were established per vegetation type, and in each sampling plot, a 5x5 m sub-plot was laid to determine the species diversity for pteridophytes. Transect walk and sampling plots in 3 mountain ecosystems revealed several vegetation types with Mt. Malindang having 9 Hamiguitan types, Mt. with 5 types and Mt. Kitanglad with 3 types. Species richness was highest in Mt. Malindang (1,164 spp.), followed by Mt. Hamiguitan (878 spp.) and the lowest in Mt. Kitanglad (661 spp.) Regardless of the mountain ecosystem and plant groups, the montane vegetation had high species richness and diversity values than the dipterocarp and mossy Kitanglad had forests. Mt. the highest number threatened of species (92 spp.) while Mt. Malindang and Mt. Hamiguitan had 34 and 35 threatened species each, respectively. As to endemism, it showed that Mt. Hamiguitan had high endemism (34 %) than Mt. Kitanglad (21%) and Mt, Malindang (16%). Furthermore, the three mountain ecosystems showed 64 species as new record in Mindanao and 21 species in the Philippines while two species of *Nepenthes* are new to science. (Author's abstract)

**Keywords:** Environmental science, Diversity, Species richness, Assessment, Plants, Conservation, Protected areas, Mindanao

Asian Journal of Biodiversity, Volume No. Issue No. , 50-73 (Filipiniana Analytics) Fil(S) QH75.A1 A85 v.3 2012

# Effect of the diurnal variation of the convective boundary layer height over Metro Manila on pollutant concentration

# Tubal, Genelita B., Estoque, Mariano, Holdsworth, John, Villarin, SJ, Jose

Air pollutants are dispersed throughout a very thin layer of the atmosphere called the boundary layer (BL), and concentrations would be influenced by the thickness of the BL. A mono static, biaxial, vertically-pointing Mie Scattering 532 nm Nd: YAG lidar was used to observe the development of the daytime BL over Metro Manila in May 1999. The data profiles were background-subtracted, energy-normalized, and range-corrected; 20,000 profiles (30-32 minute period files) were arranged in arrays in time sequential order. A MatLab program with color enhancement capability was developed to display the range-time indicator (R TI) image to visualize the BL.

The convective BL height developed with a general pattern; it increased gradually in the early morning, rapidly from mid-morning until noontime, then slowly reaching its maximum height in the early afternoon. (The maximum height reached by the BL from 1- 4 May 1999 was 1635 m). BL height is maintained or lowered very slowly from mid-afternoon until sunset.

The BL grew higher when the surface temperature and solar radiation received was greater. Fair-weather active clouds inhibited the growth of the BL. When the relative humidity was higher, the base of the fair-weather cloud field was lower; therefore, the mean BL height was also lower. Prolonged sea breeze modified the convective BL by creating a much lower BL than when there was no sea breeze.

Around 75% of the total suspended particulates (TSP) in Metro Manila comes from traffic emissions. Traffic volume over most part of Metro Manila including the main thoroughfares near the lidar site, peaks at around 09:00

Local Standard Time (LST) and between 17:00 - 18:00 LST, although traffic volume is lower than at 09:00 LST. The traffic volume reduces to 80% from its morning peak at around noontime. The morning peak of the pollution concentration occurred earlier than that ofthe traffic. This could be due to the fact that the BL before 09:00 LST was much lower than after it. The pollution concentration on May 1 and 2 was reduced to less than 50% from its morning peak, a reduction much less than expected based on the traffic volume. This could be ascribed to the much higher BL around noontime. The May 2 pollution profile did not have a peak corresponding to the afternoon traffic volume peak because at that time the mean BL height was still very high. The May 3 and 4 pollution profiles were different from the two previous days, with values much greater around noontime. Pollution during those times was concentrated in a much lower layer due to the sea breeze effect. (Author's abstract)

Keywords: Environmental science, Lidar, Boundary layer, Sea breeze, Air pollution

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 14 Issue No. 1, 28-37 (Filipiniana Analytics) Fil(S) Q1.A3 S4 14/1 2002

# The efficiency and social acceptability of the constructed wetland of Bayawan City, Negros Oriental

Guino-oII, Robert S., Aguilar, Jr., Antonio S., Oracion, Enrique G.

The efficiency of constructed wetland becomes an issue in wastewater management because of the investments put into its establishment relative to the benefits it can offer. Of equal importance is the issue of social acceptability because it produces foul odor from the untreated effluents, occupies considerable space, and creates visual impediments in a given place. To deal with these issues, laboratory analyses were conducted revealing that the treated water from the constructed wetland of Bayawan city had significantly improved in terms of physico-chemical qualities as compared to the pre-treated water. The household survey correspondingly supported the laboratory findings as evidently shown in the high social acceptability of the constructed wetland among the residents of Fishermen's Gawad Kalinga Village where this is located. However, it has low social acceptability from the nearby residents and a minority of the GK residents surveyed who can smell the foul odor emitted during the release of the untreated effluents into the treatment pond. This paper concludes that, as a whole, the constructed wetland of Bayawan City rates high in efficiency and social acceptability. (Author's abstract)

**Keywords:** Environmental science, Wastewater management, Constructed wetland, Efficiency, Social acceptability, Domestic effluents, Recycled water

Silliman Journal, Volume No. 50 Issue No. 1, 65-92 (Filipiniana Analytics) Fil(S) AS538 S46 50/1 2009

0317

Environmental isotope techniques in the lake-aquifer interaction between Laguna Lake and the aquifer in the south sector of Metro Manila *Gregorio, Enrico G.* 

Laguna Lake is large, roughly 700 sq. km, and shallow with an average depth of 3 m. The question of water use of Laguna Lake is currently under close examination, with conflicting interests of fisheries, environmental values and potable water supply being just three of the major concerns. Earlier report had suggested that induced recharge from Laguna Lake could amount to 22 million cubic meters per year. It was also inferred that due to the severe ground water level drawdown induced recharge has contributed to an unknown degree to the water supply of Metro Manila particularly in the Alabang Taguig sector (study area). Recently, results of simulations had contribution mathematical placed almost nil from the lake.

In the light of the above mentioned concerns, major ions, the environmental isotopes tritium, deuterium and oxygen-18 were measured in water samples from 44 wells and surface water of the lake and Manila Bay. Quarterly sampling was done between May 1994 to April 1996. Bicarbonate was the dominant ion in nearly all the water from the deep aquifer. Water from the shallow aquifer is also bicarbonate type, however, there is an evidence of lake water mixing.

Isotopic composition of lake water shows a wide variance on an annual basis with the month of October and November being the most depleted. Stable isotope from the deep aquifer exhibited no seasonal changes and is clustered close to the mean precipitation value. This conf11:ms that the regional recharge is from the local rainfall and contribution from the Laguna Lake recharge is nil. However, water from the shallow aquifer shows little resemblance of the lake water as there is stable isotopes shifting toward the lake values. (Author's abstract)

Keywords: Environmental science, Ions, Environmental isotopes tritium, Deuterium, Oxygen-18

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No. , 255-284 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

# Will mangrove reforestation provide net benefits: a case in Sibunag, Guimaras *Fernandez, Cheryl Joy J., Subade, Rodelio F., Parreño, Paul Erwen T.*

In response to the threats in mangrove resources such as massive fishpond conversion, industrialization, and increased human settlements in coastal areas, the province of Guimaras answered these threats by widespread mangrove reforestation projects in its coastal communities. These projects were found out to be beneficial, as depicted on large gap on the mangroves overall benefits and the costs of implementation of the mangrove reforestation project. Results of the study show that the present total benefit of mangrove per hectare with sustainable harvesting in the first year is lesser than the costs. However after the first year, the net benefits are positive. However, in compliance with Republic Act 7161 (R.A. 7161) that banned the cutting/using of all mangrove species, cost-benefit analysis of mangrove reforestation without harvesting was also computed. The net benefits exceed the costs from the start of the year up to the  $20^{\text{th}}$  year. Both the scenarios include the Mean WTP equivalent to PhP 142.75, which is the amount people are willing to give for the conservation of mangroves. The net present values (net benefits) of mangrove reforestation were found positive for both scenarios: with sustainable harvesting and without harvesting. (Author's abstract)

**Keywords:** Environmental science, Mangroves, Mangrove reforestation, Total economic value, Contingent valuation method, Willingness to pay, Cost-benefit analysis

# A model simulation of air pollution over Metro Manila Estoque, Mariano A., Balmori, Rochelle Therese F.

The diurnal variation of air pollution over Metro Manila is studied by using a theoretical model. The model equations consist of a set of fluid dynamical equations and an equation of mass transport for predicting air pollution. The dynamical equations are based on a mixed layer model of the atmosphere. The source of pollutants is assumed to be uniformly distributed over the Metro Manila area. The source strength varies in time in accordance with the variation of vehicular traffic emission during the day. Model simulations are made in order to determine the effect of varying conditions of the prevailing atmosphere. The results of the simulations indicate a predominantly semi-diurnal variation in the concentration. The maxima usually occur in the early morning and in the evening. This theoretical result is in agreement with long-term averaged observations. (Author's abstract)

**Keywords:** Environmental science, Diurnal variation, Air pollution, Metro Manila, Carbon monoxide, Numerical modeling, Model simulation

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 2, 13-31 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/2 2003

0320

# Socio-economic conditions and perceptions on the conservation of Tubbataha Reefs and vicinity: a households survey in Cagayancillo, Palawan Subade, Rodelio F., Subade, Ana Liza A.

This paper presents the results of a socio-economic monitoring survey of 110 sampled respondents! households across the 12 barangays of Cagayancillo, using a survey instrument through personal interviews. Findings show that on the average, the respondent was 48 years old, with 7 years of formal education, has lived in Cagayancillo for 31 years and belonged to a farnilylhousehold with 6 members. Cagayanens had shifted to farming as the main source of their livelihood and income, while fishing was only second. Based on their income data, Cagayanens are living below poverty threshold level of income. Poverty incidence ranged from 67-79% of the Cagayanen households. The income data for 1999 and 2004 when compared, plus the respondents' perception that present aquatic resources are not in good condition, somehow allude to the possibility that the Cagayanens may just easily fall on the vicious cycle of poverty and environmental degradation.

The good news can be the increasing involvement of people in coastal resource management and conservation. By including the people in the main Cagayancillo islands as beneficiaries of and participants in the conservation efforts and projects, WWF-Philippines/ KKP has perhaps initiated a good momentum for a democratized and more sustainable stakeholders management of coastal resources in Cagayancillo. In order to sustain this momentum for continuous people's participation in coastal resource management and conservation, and eventually the alleviation of poverty in Cagayancillo, concerned policy makers and other entities need to consider some options, one of which is the continuation of conservation efforts started by WWF-Philippines for another 2-3 years. (Author's abstract)

**Keywords:** Environmental science, Cagayancillo, Palawan, Tubbataha reefs, Socio-economic, Perceptions, Conservation, WWF Philippines

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 18 Issue No. 2, 18-33 (Filipiniana Analytics) Fil(S) Q1.A3 S4 18/2 2006
#### Species account of marine diatoms of the genus *Pseudo-nitzschia* in San Pedro Bay, Philippines

Yap-Dejeto, Leni G., Omura, Takuo, Cinco, Genneline F., Cobacha, Marjorie M., Fukuyo, Yasuwo

Phytoplankton samples were collected by bucket, 20 µm mesh size plankton net and van Dorn water sampler in San Pedro Bay, Leyte, Philippines from December 2006 to May 2008. Acidwashed valves of *Pseudo-nitzschia* were observed and critically identified using transmission electron microscopy (TEM). The following species were identified: *Pseudo-nitzschia brasiliana, P. caciantha, P. micropora, P. pseudodelicatissima,* and *P. pungens.* Morphometric measurements of valves and description of species are included herein. *P. pungens* was the most abundant species encountered in this study with maximum density at  $3.5 \times 10^4$  cells L<sup>-1</sup> during February 2007. This is the first taxonomic account at the species level of this genus in Philippine waters. (Author's abstract)

**Keywords:** Environmental science, Amnesic Shellfish Poisoning (ASP), Diatom, Philippines, Pseudo-nitzschia species, San Pedro Bay, Taxonomy

Philippine Journal of Science, Volume No. 142 Issue No. 1, 27-37 (Filipiniana Analytics) Fil(S) Q1 P55 142/1 2013

#### Spill-over effects of rural industrialization on community transformation Penalba, Linda M., Quimbo, Maria Ana T., Paunlagui, Merlyne M.

Rural industrialization has resulted in the transformation of the general landscape of the countryside. The development path taken by the peri-urban or urbanizing barangay (or community) studied was influenced by internal and external factors. Overall, the most influential factor was the establishment of industrial estates in nearby barangays. The impacts of rural industrialization spilled-over to the peri-urban barangay and affected its natural and financial assets. This was evidenced by the conversion of agricultural lands to settlement and commercial sites and the emergence of other livelihood options to cater to the needs of the growing number of industrial estate workers who settled in the peri-urban barangay.

The beneficial spill-over effects of rural industrialization include improved access to and delivery of educational, health and other social services, improved physical infrastructure, strengthened aspirations for better education, better housing and housing facilities, generation of more employment opportunities, increased female labor participation rate, regularity and increased income, and more diverse business prospects. In spite, however, of the beneficial effects, industrialization has likewise led to a number of negative outcomes like rapid increase in population which eventually gave way to the conversion of lands to settlement sites for housing and to commercial use to cater to the service needs of migrants as well as temporary settlers.

The effects of rural industrialization indeed spilled-over to adjoining communities which were not prepared or designed to provide public service beyond the needs of its local residents. This occurrence has significant governance implication and hence should be integrated in government development plans. Authorities concerned should address these needs through appropriate planning and policy interventions and additional resources to enable the peri-urban communities to cope with the exigencies associated with increased population and diversity in social

and economic activities. More in-depth study of its theoretical and practical bases is needed to determine its applicability and typology for more realistic planning and policy making. (Author's abstract)

**Keywords:** Financial assets, Environmental science, Rural industrialization, Communities in transition, Periurbanization, Social capital, Natural assets

The Philippine Entomologist, Volume No. 50 Issue No. 1, 93-110 (Filipiniana Analytics) Fil(S) AS538 S46 50/1 2009

0323

#### State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan Becira, Eunice M.

The study State of Mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City was documented and assessed using the following parameters: total area covered, diversity, population structure and diversity and threats to mangrove (cutting).

The study was conducted in May 2003 using plot-quadrat method. Ten plots were non-randomly distributed in the study area.

Fourteen major and one associated mangrove species were found in the study area (H=0.85). The three dominant species were *Rhizophora apiculata* (41 %), *Sonneratia alba* (39%) and *R. stylosa* (13%). These species also accordingly, they had the highest importance values at 192, 146, and 80, respectively.

Considering the small size of the mangrove stand, diversity was relatively high compared in other areas of Palawan. However, continuous expansion of residential areas as well as the development of various students poses a threat to the survival of mangroves. Thus, demarcation of the present mangrove area in Tiniguiban Cove is needed. (Author's abstract)

**Keywords:** Environmental science, Mangroves, Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan, Parameters, Total area covered, Diversity, Population structure, Diversity and threats to mangrove (cutting)

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 17 Issue No. 2, 46-51 (Filipiniana Analytics) Fil(S) Q1.A3 S4 17/2 2005

0324

Subsequent effects of intraruminal soluble glass bolus on plasma calcium, phosphorus and magnesium content of grazing does under backyard conditions in selected areas in Nueva Ecija, Philippines

Orden, Edgar A., Hayashida, Maki, Cruz, Emilio M., Cruz, Libertado C., Fujihara, Tsutomu

The effects of intra-ruminal administration of soluble glass bolus (SGB) containing selenium (Se), copper (Cu) and cobalt (Co) on the blood mineral content was determined among 60 grazing upgraded goats raised under backyard condition. The animals were fed only with available feed resources within the paddy field and mango orchard. The subsequent effects of SGB supplementation on plasma Ca, P, and Mg were determined for 12 months. Plasma mineral concentrations were determined using Inductively Coupled PlasmaSpectrophotometer (ICPS) after wet ashing with nitric acid.

SGB administration did not affect the Ca, P, and Mg contents in the blood. Except for the marked increased in the plasma Mg level of animals in the control group during the early stage of the trial, there was no clear indication of monthly variations in plasma mineral concentrations among animals with by the bolus supplementation. Results also revealed that plasma Ca concentrations of the animals appeared to more stable than P and Mg. On the other hand, plasma Ca concentration showed seasonal variation. The plasma P concentrations for both groups were significantly lower during the rainy season than during the dry season.

The normal plasma Ca, P, and Mg concentration suggests that the available feed resources under a typical ricebased and mango orchard farming conditions could provide adequate amount of these essential elements to support gestation and lactation. Hence, Ca, P or Mg imbalance is unlikely to happen even without SGB supplementation. (Author's abstract)

Keywords: Environmental science, Soluble glass bolus, Plasma minerals, Goals

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 29-30 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

#### Use of edible forest plants among indigenous ethnic minorities in cat tien biosphere reserve, Vietnam

#### Thanh Sang, Dinh, Nobuya Mizoue, Kazuo Ogata

Based on the surveys combining the use of household interviews, key informants, rapid rural appraisal (RRA), and the "walk-in-the-wood" method; this article examines the uses of edible forest plants among the indigenous ethnic minorities (IEMs) in Cat Tien Biosphere Reserve (CTBR), southern Vietnam. The findings confirm that all of the respondents gathered and harvested the edible forest plants for both subsistence and income generation, primarily for favorite daily food. Overall, the survey identified 100 species of edible forest plants belonging to 45 families used by the IEM households, these were collected from natural forest, forest plantations and allocated forest land in CTBR, but primarily from the first type of land; 100% of households surveyed harvested some or many species of the plants. However, poor harvesting practices and overuse of the plant species are threatening their sustainability, the local uses and even the food source for wildlife. Additionally, most of the gathering was officially illegal since it occurred in state protected forests. It is recommended that the participation of IEMs in planned uses as well as the forest resources management, improved harvesting practices, techniques of domestication, encouragement of priority forest edible cultivation should be preferred. (Author's abstract)

**Keywords:** Environmental science, Cat tien biosphere reserve, Domestication, Edible forest plants, Indigenous ethnic minorities, Sustainable use

Asian Journal of Biodiversity, Volume No. Issue No. , 23-49 (Filipiniana Analytics) Fil(S) QH75.A1 A85 v.3 2012

#### **FISHERIES**

#### Assessment of local government's implementation of open access policy in Taal Lake, Philippines: effects on lake conservation and management Mercene-Mutia, Ma. Theresa

The effects of local government's implementation of the current national policy on open access in municipal fisheries are assessed in terms of their impact on the fishery resources of Taal Lake. Local officials and fisherfolk were interviewed and their responses were analyzed for trends in perceptions on how local open access policies affect fishing practices and productivity in the lake. A policy matrix containing certain areas of concern of local governments related to sound decision-making on lake fishery was designed.

The study shows that local government implementation of open access policy in Taal Lake tends to have negative effects on the lake's fisheries. Open access allows for the unregulated entry of fishing practices like fish cage culture which tend to increase the pollution load in the lake. Pollution due to fish farming in cages seems to even exceed loads from domestic wastes and agricultural runoff. While fish cages flourished in the lake, the income of small fisher folk has declined because of dwindling catch from capture fisheries.

It is recommended that national government agencies (e.g., Department of Agriculture, Bureau of Fisheries and Aquatic Resources, Department of Environment and Natural Resources) should forge an agreement with local government units for a continuing assessment of the fishery resources in Taal. This needs to be coupled with technical assistance to undertake sustained efforts to improve the conservation, productivity and management of the lake's aquatic resources. There is also a need to increase the budgetary allocations for new research and extension activities to address problems and issues of the fishery sector in the lake and for upgrading the capability of local and sectoral policy and decision makers on the lake's fisheries. (Author's abstract)

Keywords: Fisheries, Fish cage, Fisher folk, Lake ecosystem

Conservation and ecological management of Philippine Lakes in relation to fisheries and aquaculture, Volume No. Issue No. , 123-132 (Filipiniana Analytics) Fil(B) SH1 C74 2001

#### Assessment on the estuarine areas of Camotes Islands, Central Philippines: their ecology and prospects for milkfish (Chanos chanos) and prawn (Penaeus monodon) industry *Tanduyan, Serapion N., Elizalde, Ailyn C., Tampus, Christie G., Luchavez, Loida F., Formentera, Mary Grace B.*

The three estuarine areas in Camotes Islands, Cebu, Philippines namely; Baring, San Isidro, San Francisco, Cebu, Baliis, McArthur, Tudela, Cebu, and San Isidro, Pilar, Cebu were studied in order to determine the status of bangus fry (*Chanos chanos* Forsskal) and sugpo fry (*Penaeus monodon* Fabricius) in these areas. Other species of fish caught together with them and the profile of the estuarine areas as prospects for fry industry in the Islands were also

noted.

A simple skimming net locally known as *hudhud* or *tigpayan* was used to collect fry of bangus, sugpo and fry of other species. The other fishes caught with the bangus and sugpo were accounted for and determined up to species level. An interview guide was used to gather data from the fishermen in the estuarine areas.

Results showed that Sitio Baring, San Isidro, San Francisco, Cebu topped the estuarine areas in Camotes Islands in terms of abundance of fry of bangus, sugpo and other fry species, followed by Mc Arthur, Tudela, Cebu and San Isidro, Pilar, Cebu. There were 16 species of fry in Camotes Islands including bangus and sugpo: eight families of fish; 1 family of Crustacean and 1 family of shellfish.

Catch per Unit Effort (CPUE) was 30 pcs of bangus fry/ minute operation of skimming net in Baring, San Isidro, San Francisco, Cebu; 3-7 pcs of bangus per minute operation of skimming net in Baliis, Calmante, Tudela, Cebu and 1 pc of bangus fry/ 5 minutes operation of scoop net in San Isidro, Pilar, Cebu. The salinity profile of the three estuarine areas surveyed ranged from 5 ppt to 36 ppt; temperature was 28-35°C; pH is 7.3-8.1 and transparency is 6-20 inches. (Author's abstract)

Keywords: Fisheries, Estuarine areas, Bangus, Sugpo, Ecology, Camotes Islands

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 104 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0328

#### Deriving recruitment and spawning patterns from a survey of juvenile grouper (Pisces: Serranidae) occurrences in the Philippines Mamauag, Samuel, Penolio, Lutgarda, Aliño, Porfirio

Preliminary data on the patterns of occurrence of juvenile groupers in the Philippines was examined. Survey questionnaires were randomly distributed to respondents (i.e., fishers and traders of juvenile groupers). Patterns of presence/absence of the juveniles were examined and recruitment and spawning patterns were inferred from survey results. Results showed that patterns of recruitment of juvenile groupers in the Philippines varied greatly with each area/region. The large variability in the recruitment patterns precluded a "general pattern". Upon closer examination, however, some emergent signals were noted, albeit not very strong. Spatio-temporal patterns for recruitment of juvenile groupers seemed to be influenced by change in seasons (summer and wet) and monsoons (northeasterlies and southwesterlies). Inferred spawning patterns likewise varied with area/region and an inter-specific variation in spawning behaviour may be possible.

Although results are preliminary due to lack of intensive data verification, a more rigorous type of sampling protocol is worth pursuing in the future. The results of this preliminary examination provided insights on the recruitment of the commercially important epinepheline serranids in the Philippines. (Author's abstract)

Keywords: Fisheries, Groupers, Lapu-lapu, Fish recruitment, Spawning patterns

#### Fish culture in cages in Lake Danao, Cebu Tanduyan, Serapion N., Bontia, Ponciano C.

Lake Danao is a picturesque inland body of water having an area of 685 ha located in the municipality of San Francisco in Pacijan Island, Camotes, Cebu. At the middle of the lake is a circular islet with an area of one acre. This lake is a potential area for cultivation of fishes in pens and cages. To date there are only two agencies which use the lake for fish production, namely; the Department of Agriculture Regional Office No 7 Carmen-Lake Danao Fishery Complex Research Outreach Station and the CSCST-Fishery and Industrial College, San Francisco, Cebu. The following are the ranges of selected water quality parameters: salinity, 0-0.5 ppt; water temperature , 11-19 °C $\cdot$ , pH, 8.5-9. The lake has no definite inlet and outlet of water and is free from pollutants. The water is clear with assorted vegetation. The soil is coarse, silty and sandy. The present study has shown the feasibility of growing tilapia in cages in Lake Danao. (Author's abstract)

Keywords: Fisheries, Lake Danao, Cebu, Salinity, Water temperature

Conservation and ecological management of Philippine Lakes in relation to fisheries and aquaculture, Volume No. Issue No., 109-112 (Filipiniana Analytics) Fil(B) SH1 C74 2001

0330

# Genetic diversity in wild stocks of the giant freshwater prawn (*Macrobrachium rosenbergii*): implications for aquaculture and conservation *Mather, P. B., de Bruyn, M.*

The giant freshwater prawn (*Macrobrachium rosenbergii*) is cultured widely around the world but little is known about the levels and patterns of genetic diversity in either wild or cultured stocks. Studies have suggested that genetic diversity may be relatively low in some cultured stocks due to the history of how they were founded and subsequent exposure to repeated population bottlenecks in hatcheries. In contrast, wild stocks have an extensive distribution that extends from southern Asia across Southeast (SE) Asia to the Pacific region. Therefore, wild stocks could be an important resource for genetic improvement of culture stocks in the future. Understanding the extent and patterns of genetic diversity in wild giant freshwater prawn stocks will assist decisions about the direction future breeding programs may take. Wild stock genetic diversity was examined using a 472 base-pair segment of the 16S rRNA gene in 18 wild populations collected from across the natural range of the species. Two major clades ("eastern" and "western") were identified either side of Huxley's line, with a minimum divergence of 6.2 per cent, which implies separation since the Miocene period (5-10 MYA). While divergence estimates within major clades was small (maximum 0.9 per cent), evidence was also found for population structuring at a lower spatial scale. This will be examined more intensively with a faster evolving mtDNA gene in the future. (Author's abstract)

Keywords: Fisheries, Macrobrachium rosenbergii, Freshwater prawn, Genetic diversity, Cultured stocks, Wild stocks

#### Influence of music on the growth of koi carp, *Cyprinus carpio* (Pisces:Cyprindae) *Vasantha, L., Jeyakumar, A., Pitchai, M. A.*

An experiment was carried out to investigate the influence of music on the growth of Koi Carp (*Cyprinus carpio*) by subjecting the fish to music. Weekly growth in weight was recorded and used to calculate the growth rate and specific growth rate. The difference in growth between the control and experiment groups of fishes was statistically tested for significance. It was observed that the growth of fish subjected to music was significantly higher. (Author's abstract)

Keywords: Fisheries, Cyprinus carpio, Pisces, Cyprindae, Rhythmic sound, Systematic sound

NAGA, WorldFish Center Quarterly, Volume No. 26 Issue No. 4, 25-26 (Filipiniana Analytics) Fil(S) SH1 I81 26/4 2003

#### Padal fishing: a unique fishing method in the Ashtamudi estuary of Kerala (South India) *Thomas, Joice V., Kurup, B. M.*

Bush park fishing / *padal* fishing is an indigenous fishing method widely employed in the Ashtamudi estuary of Kerala (south India). An artificial reef made from twigs and leaves of trees is planted in the shallow areas of the estuary. The aim is to harvest fish that find shelter in these structures for the purpose of feeding and breeding. Though the State Department of Fisheries has banned this method of fishing in the inland waters of Kerala, 400 padals are operating in this estuary. About 300 of them are anchored in the western parts of the estuary (west Kayal). Fish are harvested in the padals at monthly intervals almost round the year and this results in the destruction of a sizeable quantity of juveniles and sub-adults of the commercially important fishes, such as Pearl spot and mullets, from the estuary. These padals pose a major threat to the sustainability of the fishery resources of this estuary and, therefore, need to be phased out by providing alternative occupations for the fishermen who are dependant on the padals. (Author's abstract)

Keywords: Padal fishing, Bush park fishing, Fisheries, Crassostrea madrasensis (edible oyster), Ashtamudi estuary

0333

Salinity tolerance of freshwater catfish (*Clarias batrachus* Linnaeus and *Clarias macrocephalus* Gunther) in aquaria in the laboratory of CSCST-Fishery and Industrial College, San Francisco, Cebu Tanduyan, Serapion N., Miao, Adones G., Costas, Alled B., Villarin, Angelito D.

NAGA, WorldFish Center Quarterly, Volume No. 27 Issue No. 3-4, 24-27 (Filipiniana Analytics) Fil(S) SH1 I81 27/3-4 2004

A plan for the cultivation of freshwater catfish in marine waters of Camotes Islands was made due to its diminishing yield as well as to improve its taste. This study was conducted to determine the reactions of the two species of freshwater catfish (*Clarias batrachus* Linnaeus and *Clarias macrocephalus* Gunther) to the dilution process in terms of swimming behaviour, breathing, color changes and the feeding behaviour and movement of the fish including its mortality and survival rates.

The Complete Randomized Design (CRD) using glass aquaria was used to prepare the culture media. There were five batches and six treatments of this study in which the control ( $T_0$ ) had a salinity range from 0-0.9 ppt;  $T_1$ , is 1-5 ppt;  $T_2$  is 6-10 ppt.;  $T_3$  is 11-15 ppt.;  $T_4$  is 16-20 ppt;  $T_5$  is 21-25 ppt. Feeds given were 5% of the body weight of the fish.

Results showed that leaping and other swimming movements of both species of fish increased from 2.0 ft. in  $T_0$ to 2.3 ft in  $T_3$ ; however, it slows down to 1.4 ft. in  $T_4$ . Breathing frequency was highest in  $T_3$  (61 times in 1 hour in both species of freshwater catfish and lowest breathing rate was 29 times/hr in T<sub>4</sub>. Color changes occurred after several days from black to dark brown in  $T_0$  to dark brown in all the rest of the treatments. Feeding consumption rates from 25 seconds in  $T_0$  increased to 30 seconds; 40 seconds and 230 seconds in  $T_1$ ,  $T_2$  and  $T_3$  respectively. In  $T_3$ only 15% of the feed given was consumed in this treatment.

Mean survival rate of *Clarias batrachus* Linnaeus and *Clarias macrocephalus* Gunther was 100% from  $T_0$  to  $T_3$  but a very high salinity level was fatal. (Author's abstract)

Keywords: Fisheries, Clarias batrachus Linnaeus, Clarias macrocephalus Gunther, Aquaria, Salinity tolerance

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 70 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

## Save *Ludong*, the most delicious and expensive fish in Republic of the Philippines *Dela Cruz*, *R*

Ludong or banak (*Cestraeus plicatilis*) is a freshwater fish endemic to Cagayan River and its tributaries extending through the watersheds of Cagayan Valley to the Santa-Abra River Systems in Ilocos Sur and Abra . It is herbivorous and feeds on algae, swims to the ocean to spawn from October to November and returns to upstream from December to February. Ludong is now becoming an endangered species and its size become smaller, the Bureau of Fisheries and Aquatic Resources (BFAR) had issued an administrative order for the conservation of the fish. BFAR also engaged in a research and development project to study the reproductive biology and conditions affecting its population dynamics to sustain its production and conservation management. Since ludong is now considered an endangered species, benchmark information is needed to study its monthly reproduction specially during its spawning season and its sexual maturity to formulate conservation measures. On the other hand, breeding the ludong in captivity has been recommended to further study its market potential and to sustain production and supply throughout the year.

Keywords: Fisheries, Ludong, Banak, Cestraeus plicatilis

#### 0334

Agriculture magazine, Volume No. 13 Issue No. 2, 56-57 (Filipiniana Analytics) Fil(S) S19 A83 13/2 2009

#### Sedimentation rate in fringing reefs of Honda Bay, Puerto Princesa City, Palawan, Philippines with reference to coral reef condition Becira, Joel G.

The study was conducted to determine and compare the rate of sedimentation in two fringing reefs in Honda Bay during two seasons, to discuss sedimentation rate in relation to selected environmental parameters, to determine the coral cover in the two stations, to compare it with data from 2000 and to explain eventual changes in coral cover in relation to the selected environmental parameters, especially sedimentation. The study was conducted from March 1,2003 to November 30, 2003. Two stations, Bush and Meara Islands, in Honda Bay were established. Each station was mounted with three sets of 3-replicated sediment traps that were collected one week after installation. Each station was further assessed in terms of coral cover. The average sedimentation rates in Honda Bay during dry and wet season were 3.50 and 10.00 mg/cm2/day, respectively. The sedimentation rates in the two islands did not show significant difference at 5% level of significance. Benthic cover of both Bush and Meara was higher in 2003 than in 2000. The fact that coral cover is able to recover despite sedimentation seems to indicate that sedimentation has not yet reached critical levels in Honda Bay. (Author's abstract)

Keywords: Fisheries, Coral reefs, Sedimentation, Honda Bay, Philippines

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 21 Issue No. 1, 7-13 (Filipiniana Analytics) Fil(S) Q1.A3 S4 21/1 2009

#### Spawning and hatching performance of the silvery black porgy *Sparidentex hasta* under hypersaline conditions *Yousif, O. M., Ali, A. A., Kumar, K. K.*

Abu AI Abyad island is characterized by harsh environmental conditions. A preliminary trial conducted at the island to investigate the spawning and hatching performance of the blue finned sea bream *Sparidentex hasta* indicated that the fish can be successfully bred at high salinity levels exceeding 50 ppt. (Author's abstract)

Keywords: Fisheries, Sparidentex hasta, Spawning performance, Hatching performance, Silvery black porgy

NAGA, WorldFish Center Quarterly, Volume No. 26 Issue No. 4, 13-15 (Filipiniana Analytics) Fil(S) SH1 I81 26/4 2003

0337

#### The status of tilapia aquaculture in Lake Sebu, South Cotabato Beniga, Zosipat M.

Tilapia culture in Lake Sebu started in the early 1970's and is now considered the backbone of the economy and major driving force of the development of the Municipality of Lake Sebu. About 19% of Lake Sebu's 354 ha water

area is used for aquaculture. The present tilapia production system is not as intensive as in other lakes in the country. The daily 3-ton tilapia harvest is marketed in the different towns within the province and in neighboring provinces. Municipal Ordinance 01, Series of 1994 regulates fish cage establishment within the lake. The local government unit launched a semi-annual 'Oplan Linis', a clean up operation to remove floating debris, water hyacinth, and other vegetation along the lakeshore. Reforestation has been implemented as part of the watershed management program. For centralized marketing and effective collection of revenues, a fish port was opened in January 1997. The tilapia industry in Lake Sebu is now confronted with several setbacks. Poor-quality seeds require a longer culture period and, despite higher inputs, still result in low production. Fish kills, locally termed 'kamahong', are becoming more frequent and devastating. Market competition is another problem. Producers of intensively fed tilapia from Lake Sebu have to contend with a large volume of unfed and low priced tilapia from Lake Buluan (Lutayan area). (Author's abstract)

#### Keywords: Kamahong, Fisheries, Tilapia, Oreochromis mossambicus

Conservation and ecological management of Philippine Lakes in relation to fisheries and aquaculture, Volume No. Issue No., 95-98 (Filipiniana Analytics) Fil(B) SH1 C74 2001

0338

#### Survivorship and growth performance of red spiny lobster *Panulirus longipes longipes* reared in floating netcages fed with *Sardinella* spp at different feeding rates *Becira, Joel G., Orcajada, Marivel*

This study was conducted to determine the survivorship and growth performance of *Panulirus longipes longipes* fed with *Sardinella* spp. in floating netcages at different feeding rates and to determine which feeding rate provides the best feed conversion ratio.

Results showed that a feeding rate of 20% gave the highest growth (final average weight) followed by 15% and 10% feeding rates, respectively. In terms of length increment, 20% feeding rate likewise promoted the highest increment.

Differences in feed conversion ratio among treatments was significant (PAuthor's abstract)

Keywords: Fisheries, Feeding rates, Panulirus longipes longipes, Cage culture, Sardinella spp

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 18 Issue No. 1, 11-17 (Filipiniana Analytics) Fil(S) Q1.A3 S4 18/1 2006

0339

#### Sustainable marine fisheries production in the Philippines Dickson, Jonathan O., Tiongson, Lainie C.

The fisheries sector plays an important role to the economy of the country. In the coastal and marine waters as well as aquaculture, it provides substantial benefits to the Filipino nation, not only on food and essential nutrients

but also substantive employment and sustenance, and valuable foreign exchange for the country's developing economy. The total fisheries production is contributed by the three (3) sectors, namely; the aquaculture sector, municipal sector and commercial sector. In 2001, the marine landings were about 66% or 1,946,074 M.T. of the total fisheries production. Fishermen (small scale and commercial) use various types of gears, with heavy concentration in inshore/municipal waters where production is highest. Despite the stable figures of catch and exports of the fisheries, this sector faces serious challenges in the management of fisheries. Overexploitation of coastal resources and other factors have been reported in various documents and forums, and the problem still continues. As a contribution to sustainable marine fisheries production, this paper discusses an overview of the fisheries resources, contribution of fisheries by sector, the major problems of the industry, sustainable fishing technologies, and fisheries management approaches and key recommendations. Sustaining the country's fisheries and coastal resources requires urgent and concerted action by responsible authorities and the wider participation of stakeholders in all levels. In this context, successful interventions must be required for the effective implementation of a wide range of measures as well as shifts in management perspectives. (Author's abstract)

Keywords: Fisheries, Sustainable, Fishing technologies, Management, Production

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 10 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

0340

### Towards sustainable aquaculture in the Philippines *Platon, Rolando R.*

The Philippines has one of the highest per capita fish consumption in the world. However, in recent years the national total fish production could not meet this per capita requirement. There are three fishery resources, namely commercial and municipal fisheries and aquaculture, but only aquaculture offers the potential to fill the gap between increasing demand and supply. Further growth and development of aquaculture is faced with problems which can jeopardize its sustainability. Sustainable aquaculture requires that these key constraints are properly addressed. It is only then that the potential for growth and sustainability of Philippine aquaculture can be realized. (Author's abstract)

Keywords: Fisheries, Aquaculture, Philippines, Food security, Environment

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 11 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

0341

### Use of enriched live prey in promoting growth and maturation of tiger shrimp (*Penaeus monodon*) Yong Seok Kian, A., Mustafa, S., Rahman, R. A.

This study was undertaken to determine the effect of nutritional management of broodstock of *Penaeus monodon* on growth and maturation. Test specimens were obtained from a grow-out pond before attainment of maturity and were reared in hatchery tanks. Four types of dietary treatments (MI-M4) were given to separate batches that were

run in duplicate. Feeding trials continued for five months. A diet with live bloodworm, bioencapsulated to contain tricalcic phosphate as its major component, was found to be the most efficient. Specimens of this particular batch assimilated food more efficiently, grew at a faster rate and attained maturity earlier than other groups. Bloodworm provided the lipid fractions for which there is no *de novo* synthesis in shrimp. The enrichment product acted by promoting somatic growth and increasing transfer of biochemical constituents needed by the ovary for development. (Author's abstract)

Keywords: Fisheries, Penaeus monodon, Tricalcic phosphate, Bloodworm, No de novo synthesis

NAGA, WorldFish Center Quarterly, Volume No. 27 Issue No. 1-2, 55-59 (Filipiniana Analytics) Fil(S) SH1 I81 27/1-2 2004

#### FOOD SCIENCE AND TECHNOLOGY

0342

### Determination of *Trans* fatty acid in virgin coconut oil and other fats and oils by gas chromatography

#### $Dumag, \textit{Rosemarie J., Arde} \tilde{A} \pm a, \textit{Julita G., de Leon, Marco P., Portugal, Teresita R.}$

Trans fatty acid (*t*FA) in fats and oils were identified to be a risk factor for CHD and was made mandatory requirement under the Nutrition Labeling (US NLEA, 2000 and Canada, 2003). The study aims to validate/verify the AOCS Ch2a-94 Gas Chromatography (GC) method of *t*FA analysis for virgin coconut oil (VCO) and other fats and oil.

Precision and accuracy were determined using in-house food reference material (IFRM, Grape seed oil), 2 Food Analysis Proficiency Assessment Scheme Quality Control Test Material (FAPAS QCTM, Vegetable oil and Breakfast Cereal), and inter-laboratory test with foreign laboratory. Linearity, LOD and LOQ were determined by 5 level concentration using 10 different *tFA* standards. Twenty five VCO samples and 5 refined, bleached and deodorized (RBD) oils were studied.

The method was found to be precise and accurate with Horrat value of 1.8 which is within the acceptable criteris (<2) and %recovery of 78.03% (addition method) and 112% (QCTM). Inter-laboratory test showed 0.09% difference in IFRM analysis. The calibration curve was linear (0.9786 – 0.9992) at a concentration tange of 0.0044 – 0.38 mg/L. The LOD was 0.00255 mg/mL and the LOQ was 0.00851 mg/mL. Using the US NLEA guidlines, all VCO samples contained zero *tFA* while the RBD oils contained of up to 2.2g/100g oil *tFA*.

In conclusion, VCO contains zero *t*FA and the AOCS method can be used for *t*FA analysis in VCO and other fats and oils. The method can be recommended for *t*FA analysis of fats and oils from food products. (Author's abstract)

**Keywords:** Food science and technology, Trans fatty acid, Virgin coconut oil, Method validation, Gas chromatography

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 157 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

#### Fish freshness analysis using a polyaniline/nylon composite-based chemiresistor sensor Santiago, Karen S., Chua, Charles Patrick B., Sevilla, III, Fortunato B.

Food safety assurance is an important factor in building confidence to consumers when choosing a particular product. In the fish sector, freshness of fish is placed into a great consideration in order to ensure the health and safety of the consumers, and to maintain the quality of their products. Trimethylamine (TMA), a volatile amine compound responsible for the pungent, fishy, ammonia like aroma in fish, is a typical marker for fish freshness detection. TMA is the toxic gas found after death of a fish. In previous studies, a series of inspections were performed to determine freshness of fish, but methods are ineffective and found to be time consuming.

In this study, a chemiresistor sensor based on polyaniline (PANI)/nylon composite was developed for the headspace analysis of trimethylamine. The polymer composite was prepared by an *in situ* chemical oxidative polymerization of 0.4 M aniline with an equimolar amount of HC1 onto a nylon membrane using 0.6 M ammonium peroxysulfate oxidant. The composite was mounted on a home-made assembly for resistivity measurement based on the four-point probe method. The assembly design allowed the membrane composite to be in contact with the head space of the measurand system. The measured resistance varied with the TMA concentration, exhibiting a sensitivity of 14.05 mA/- log ppb TMA and linearity (r) of 0.975 at a dynamic concentration range of  $10^{-9}$  to  $10^{-6}$  ppb TMA. It is repeatable showing a COV of 7.8% for the  $10^{-6}$  ppb sample cycled thrice. TMA in fish was detected on the 8<sup>th</sup> hour exposure. This type of gas sensor is attractive because it provides a promising low-cost means to monitor TMA at RT. (**Author's abstract**)

**Keywords:** Food science and technology, Fish freshness, Polyaniline/nylon composite, Trimethylamine, Chemiresistor, Gas sensor

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 146 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0344

# Method validation for the determination of iodine in urine by ammonium persulfate digestion with spectrophotometric detection of the Sandell-Kolthoff reaction *Serafico, Michael E., Ulanday, Joselita Rosario C., Perlas, Leah A.*

Urinary iodine excretion (UIE) has been widely regarded as a biochemical marker for prevention and control of iodine deficiency disorders (IDD). To determine UIE levels, most methods require pretreatment of urine sample before its colorimetric detection based on the Sandell-Kolthoff reaction. In this study, a greener and safer oxidizing agent for the removal of iodide interferents in urine was used and validated. Three levels of pooled urine sample and a sample taken from the interlaboratory comparison used as control were analyzed for UIE using the ammonium persulfate method. Spectrophotometric detection of iodine in urine at 420 nm was performed after the addition of arsenous acid and ceric ammonium sulfate in the digested sample. The calibration curve was linear ranging from  $0 - 800 \,\mu$ g/L. The detection limit was  $0 \,\mu$ g/L and the quantitation limit was  $0.2 \,\mu$ g/L urinary iodine. The method had an intra-assay coefficient of variation (CV) of 26.3% for the low, 4.1% for medium and 2.2% for high UIE level controls. The inter-assay CV resulting from inter-analyst and inter-instrument analyses were 15.7% and 3.8%, respectively. The validated method for urinary iodine determination is fast, safe and economical. (Author's abstract)

Keywords: Food science and technology, Urinary iodine, Ammonium persulfate, Sandell-Kolthoff, Validation, Urine

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 156 (Filipiniana Analytics)

#### Method validation of plasma or serum retinol analysis using high performance liquid chromatography UV/VIS detection *Trio, Phoebe Z., Perlas, Leah A., Ulanday, Joselita Rosario C.*

Validation of analytical methods is essential in the generation of data for biochemical assessment studies to obtain reliable results that can be satisfactorily interpreted. For this purpose, the validation of plasma or serum retinol using high performance liquid chromatography was performed according to the requirements of ISO 17025 by taking into consideration the different criteria such as linearity, instrument detection limit, limit of quantitation and detection, trueness, repeatability and reproducibility.

The va;lidation was carried out by using 100  $\mu$ L of plasma or serum with 100  $\mu$ L of retinyl acetate in absolute methanol. It was mixed for 2 seconds and extracted twice with 500  $\mu$ L of hexane. The combined extracts were dried up under the stream of nitrogen gas. It was redissolved in 100  $\mu$ L of 4:1 methanol-dichloromethane and 50  $\mu$ L aliquot was injected to HPLC-UV/Vis.

Results showed that elution time of retinol was at  $3.090\pm0.014$  minutes and calibration standards behaved linearly (R2= 0.9994±0.0001) over the calibration range of 0.37-6.66 mg of retinol. The accuracy of the method evaluated from the analysis of the certified reference material was 102.89%. The % RSD of repeatability and reproducibility of the method were 3.35% and 3.76%, respectively. The detection limit was lower than the quantification limit and within the admitted performance range.

The results of the analysis performed to validate the analytical method for the determination of retinol in plasma or serum showed that they were within the performance criteria set for this method and they met the requirements of ISO 17025. (Author's abstract)

**Keywords:** Food science and technology, Plasma or serum retinol, High performance liquid chromatography, Method validation

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 158 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0346

#### Quick-cooking rice processes for Philippine rice cultivars Azanza, Ma. Patricia V., Basman, Camila V., Maceda, Gerald A.

Six Philippine rice cultivars were used to develop quick-cooking rice products. Hydration using 1: 1 mixture of 0.5% sodium citrate and 0.5% calcium chloride solutions maintained at 50°C for 15 min showed water uptake and volume expansion values ranging from 1.17 - 1.23 and 1.37 - 1.56, respectively. Gelatinization using water-to-rice ratios of 1.0:1 -1.2:1 and steaming under pressure at 121.5°C for 2 min resulted to 100% gelatinization and minimum clumpiness. Convective air drying, freeze-drying, and combination of freeze-drying and convective air drying resulted to drying times ranging from 0.7- 2.0, 2.6 - 5.0 and 3.2 - 4.2 h, respectively. Dehydrated samples produced using freeze-drying and combination processes were shown to be susceptible to disintegration.

Rehydration by boiling in water for 5 min or soaking in hot water at 60-70°C for 10 and 15 min were recommended. (Author's abstract)

Keywords: Food science and technology, Quick-cooking rice, Disaster food, Instant rice

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 23 Issue No. 2, 87-100 (Filipiniana Analytics) Fil(S) T1 N21 23/2 1998

0347

#### Radioisotopes as tools in food and nutrition research *Florentino, Rodolfo F.*

In the Philippines as in many developing countries, protein-energy malnutrition, vitamin A, iron and iodine deficiencies continue to pose serious health problems particularly in children, pregnant and lactating women. These problems per World as Declaration on Nutrition adopted by government ministers and senior policy makers from more than 150 countries, dramatically should reduced if not virtuallv eliminated be bv the vear 2000.

The rapid advances in isotope techniques contributed significantly to a greater and better understanding of the quantitative relationships of diets, nutrients and health. While it is recognized that isotopic techniques have a wide variety of application in human nutrition, this paper will focus on how radioisotopes may be applied in clarifying nutritional problems specifically iron, iodine, vitamin A deficiency and how such knowledge is applied in developing practical methods for eliminating them . (Author's abstract)

Keywords: Food science and technology, Malnutrition, Vitamin A, Iron, iodine deficiencies

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No. , 175 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

0348

#### Standardization of thermal processes for local foods with emphasis on low-acid foods Alabastro, Estrella F., Magluyan, Virginia B.

The minimum process for selected low acid foods was established based on the thermal death time (TDT) of P.A.3679 in the food and the heat penetration characteristics of the food products. The products studied were: (a) vegetable products - green papaya, langka, sitao, mushroom, waterchestnut and baby corn; (b) meat products - lechon, paksiw, dinuguan, longaniza and caldereta; and (c) seafood products - squid adobo. The integrated lethality approach was adopted for process calculations recommended by Stumbo (1973).

The minimum thermal process was tested by a pilot scale production followed by microbiological, physicochemical and sensory evaluation tests to check the soundness of the product.

Preliminary research on the effect of the minimum process established on the retention of nutrients, particularly thiamine, was also carried out for lechon paksiw and sitao. (Author's abstract)

Keywords: Food science and technology, Low-acid foods, Thermal death time (TDT), Standardization

Science Diliman, Volume No. Issue No., 105-175 (Filipiniana Analytics) Fil(S) Q1.A3 S35 v.1 1980

#### FORESTRY

0349

#### Carbon storage and sequestration potential of upland and mangrove forest ecosystem in Binahaan Watershed and Padre Burgos Quezon

Gevaña, Dixon T., Pulhin, Florencia B., Lasco, Rodel D., Pillas, Michael Joseph SM., Laluan, Enrico M.

Conservation of mature forests and mangrove stands is being eyed as an effective means to mitigate climate change. As the latest assessment report of the Intergovernmental Panel on Climate Change (IPCC) suggests, the global mean temperature has dramatically increased over the past decade and may spell major disasters to our ecosystem. Protection of the remaining forests is, therefore, crucial. Statistics shows that we are losing in a global scale around 6 million ha of primary forest and 3,500 ha of mangrove areas annually. This problem therefore entails a gigantic loss in forest biomass which could have been very helpful sequestering the atmospheric carbons. Given this backdrop, it is therefore relevant to assess the how much carbon does our primary forest and mature mangroves produce so that we could have a gauge for valuing it as an important resource. To measure the biomass and carbon density values, a nested plot method developed by ICRAF-ASB Program and allometric equations developed by Brown (1997) and Komiyama et.al. (2005) were employed. Results showed that the mature secondary forest stand in Binahaan has a larger amount of sequestered carbon than the mangrove forest. The biomass and carbon density for this ecosystem is around 245.5 tons/ha and 128.9 tons/ha respectively, while the amount of carbon it sequesters every year is roughly 14 to 27 tons/ha. On the other hand, the estimates of biomass and carbon density for the

*Rhizophora* mangrove site in Padre Burgos were 153.0 tons/ha and 92.4 tons/ha respectively with a yearly carbon sequestration rate of 0.47 tons/ha/yr. Despite the fact that mangrove forests have lower storage and sequestration capacity, forest protection should still remain as the foremost goal of the government and local communities in order to maximize not only the full potential of sequestering carbon but also for providing a healthy habitat to marine resources. On the other hand, proper silvicultural management should also be an imperative in managing our upland forests in order to improve its vigorous conditions in mitigating climate change. (Author's abstract)

Keywords: Forestry, Carbon storage and sequestration, Climate change, Upland forest, Mangrove forest

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 38-39 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0350

### Effects of forest gaps on foliage insect diversity in the perment field laboratory areas (PFLAS)in Mt. Makiling Forest Reserve Herrera, Kristine Joy M., Balatibat, Juancho B., Luna, Amelita C.

The effects of forest gap on the diversity of soil insects were studied on three different sites at the Mt. Makiling Forest Reserve from May to July 2005. Soil litter insects from 1-kg soil samples were extracted through Berlese method. Specimens were identified up to family level and various diversity indices were computed.

A total of 66 species of soil insects, belonging to 42 families was sampled from the three study sites without gap while only 54 species in 37 families were collected in areas with gaps. Statistical analysis showed that differences in species diversity level between areas with gap and without gap, in general, were significant at  $P \le 0.5$ . Thus, results indicate that areas without gaps have higher diversity compared to areas with gap. On the other hand, areas with gap had higher dominance had high population density of some soil insects such as Family Poduridae and Family Formicidae.

species of soil insects were able to tolerate the disturbance in the area. However, Gap 3 had high soil insect diversity due to the fallen logs and damage seedlings which were inhabited by different kinds of soil insects. Presence of other soil arthropods such as Class Arachnida, Class Diplopoda, Class Chilopoda, Class Crustacea and Class Symphyla were also observed in the study areas.

Diversity and abundance of soil insects vary with the occurrence of disturbances (forest gap). Artificial or manmade forest gap such as land clearings decrease the number of soil insect species. On the other hand, natural tree fall gaps caused by storms and diseases increase the diversity of soil insects by making the habitat heterogeneous. (Author's abstract)

Keywords: Forestry, Artificial gaps, Man-made gaps, Foliage insect diversity, Forest gaps, Natural tree fall gaps

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 39-40 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

## Field growth responses of three tree species to mycorrhiza and fertilizers in the bioremediation of a mine waste dump *Parao, Marissa R.*

Mine spoils have sub-marginal conditions and entail costly rehabilitation. This study evaluated the potentials of mycorrhiza, fertilizers and tolerant species in the bioremediation of a mine waste dump in Antamok, Itogon, Benguet.

Seedlings of *Alnus maritima* Marsh Nutt., *Casuarina equisetifolia* Forst., and *Eucalyptus camaldulensis* Dehn. were subjected to mycorrhizal inoculants and planted in the mine spoil. Four fertilizer treatments: 120g compost, 0g NPK, 5g NPK and 20g NPK were also applied. Height and diameter increments were measured until the 10<sup>th</sup> month. Other parameters measured include biomass, N, P, K, Cd, Cr, Mn and Fe uptake.

Results showed that, except for Alnus, seedlings planted in the mine spoil responded positively to mycorrhiza. Likewise, Agoho and eucalyptus responded positively to 20g NPK while Alnus responded positively to 5g NPK. Alnus had the most robust growth owing to its early N-fixation which may have affected its response to mycorrhiza and fertilizers. Delayed growth and nodulation were observed in Agoho possibly due to lower tolerance to heavy metals and poor site condition. The mine spoil's heavy metals such as Cd, Cr, and Au, Fe and Mn were abnormally high but the trees planted survived. All species used were relative excluders of Cd and Cr. Only Alnus excludes Mn while Agoho and eucalyptus tolerates high content of Mn and Fe. Both nutrient and heavy metal uptake indicate the positive role of mycorrhiza and fertilizers in increasing plant tolerance to nutritional imbalance and heavy metal toxicity. (Author's abstract)

**Keywords:** Forestry, Alnus maritima, Casuarina equisetifolia, Eucalyptus camaldulensis, Bioremediation, Mine waste dump, Mycorrhiza, Fertilizers, Heavy metals uptake

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 37-38 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0352

### Improving the environment and living conditions of the rural poor: potential of reforestation CDM in the mangrove communities of San Juan Batangas *Gevaña, Dixon T.*

In the context global warming, carbon sequestration receives a considerable attention now because it provides opportunities to improve the environment and the living condition of the rural communities as well. Under the Kyoto Protocol, a flexibility provision called Clean Development Mechanism (CDM) could provide reliable sources of income and livelihood to rural poor. Highly industrialized countries (Annex 1 countries) could collaborate with developing countries such as the Philippines in investing on different environmental projects including alternative fuel production and reforestation to help them meet their carbon emission reduction targets. In the latest assessment report of the Intergovernmental Panel on Climate Change (IPCC), global mean temperature has dramatically increased over the past decades thus mitigation projects was noted to be at their fast pace. Greater attention is focused on rehabilitating tropical forests like mangrove forests to offset carbon emissions. Thus, this study was done to assess the carbon storage potential of the mangrove forest in the Mun. of San Juan in Batangas. A nested plot method developed by ICRAF-ASB Program and allometric equations developed by Komiyama et.al. (2005) were employed to estimate the above-ground biomass and carbon density of the two stands: Rhizophora-dominated stand in Barangay Poctol; and Avicennia-dominated stand in Barangay Catmon. The total carbon storage in the Rhizophora dominated stand is 115.45 Mg/ha. Bakawan babae (Rhizophora mucronata) and Tabigi (Xylocaropus granatum) were recorded as the most dominant species in the area that have the largest contribution in sequestering of carbon. On the other hand, the Avicennia-dominated has a larger amount of total carbon stored with 141.71 Mg/ha. Notably, Bungalon (Avicennia marina) showed as the most effective species in the stand as far as carbon storage capacity is concern. Other species co-dominating Bungalon include Tangal (Ceriops tagal), Malatangal (Ceriops decandra) and Piapi (Avicennia marian var. rumphiana). At the sediment layer, soil carbon density was also high. Estimates showed that Avicennia stand remained to have a larger sequestration capacity than Rhizophora with 15.92 Mg/ha and 11.95 Mg/ha, respectively. Overall, both Rhizophora and Avicennia stands exhibited good carbon storage potential. This therefore entails an economic advantage for rural communities as huge amount of carbon credits can be produced and traded through reforestation and CDM. Proper forest management is likewise an essential task of both the government and local communities in order to sustain and improve the capacity of mangroves in mitigating the impacts of climate change. (Author's abstract)

Keywords: Forestry, Carbon sequestration, Reforestation, CDM, Rhizophora, Avicennia

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 43-44 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Preliminary survey of mangrooves and pine forest of Masinloc, Zambales Yap, Sheryl A., Pampolina, Nelson M., Castillo, Manuel L., Larona, Ariel R.

Floral diversity in Masinloc, Zambales was determined by surveying the vegetation along the coastal mangrove and pine forest ecosystems in September 2008. Sampling was done using visual encounter with individual plant species that were photographed. Unidentified species were collected and verified at the UPLB Forestry Herbarium. The total number of species surveyed was 25, belonging to 18 genera and 17 families. These include 12 species of trees, 8 shrubs, 3 orchids and 2 ferns. Rhizophoraceae and Acanthaceae dominated the mangrove forest; represented by two *Rhizophora (R. mucronata and R. apicuiata), Ceriops decandra* and three *Avicennia (A. mariina var. rumphiiana, A. marina and A. officinalis)*. At present, mining is operational in the pine forest of Zambales where *Pinus merkusii*, a vulnerable pine species can be found. The taxonomic list of plants in this report is important as baseline information for biodiversity. The presence of mining operation will have a detrimental effect in the ecology and existence of the pines and therefore, conservation is necessary. (**Author's abstract**)

Keywords: Forestry, Floral diversity, Pine forest, Mangrove, Mining, Pinus merkusii

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 105 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0354

## Silvical characteristics of pure and mixed stands in permanent field laboratory area (PFLA 3), Mt. Makiling Forest Reserve

#### Luna, Amelita C., Tolentino, Jr., Enrique L., Umnat, Prajate, Polinar, Anatolio N., Tulod, Adrian M.

The study was conducted to describe the current structure of tree species and regeneration dynamics in relation to the prevailing environmental conditions in PFLA 3 secondary forest. The focus was to describe and compare the overstorey structure of the two stands i.e. pure mahogany and mixed-species; assess the diversity and distribution of the regeneration under these two stands; and evaluate the prevailing site conditions such as soil characteristics and nutrients, air temperature and light intensity.

Results show that there is mean increment of 1.05 cm from 2006 to 2008 or an equivalent of 0.53 cm increment per year in the Pure stand. While in the Mixed stand a mean increment of 1.75 cm was observed or an equivalent of 0.88 cm increase in diameter per year. Majority of the trees in both stands were at least 9 meters in height. Tree heights ranged from 3.5 meters - 27 meters and 2.0 meters - 22 meters for mixed stand and mahogany stand, respectively. The species Tamayuan (Strombosia philippinensis) and large leaf Mahogany (Swietenia macrophylla King) dominate the upper canopy in the Mixed stand and Pure stand, respectively. On the hand, a total of 20 species of regenerations were found growing under the mahogany dominated forest of PFLA 3. Mahogany species had the highest total number of regeneration which comprises 33.51 % of the total regeneration count in the two stands. This was followed by Hagimit and Tamayuan with a percent regeneration of 22.16 and 20.62%, respectively. The prevailing site conditions that were measured showed the following results: bulk density, 0.934g/cm<sup>3</sup>; soil pH, 6.8; NPK. generally low; temperature, 31.19°C; and relative humidity, 73 .65%.

Although the two stands are occupying the same geographic location they exhibit variations in the different parameters measured. Hence, a more rational and convincing explanation of such variation may be gleaned from the comparison of the present site characterization studies and initial conditions or in the following measurements. Thus, in the absence of baseline information, it is suggested that a follow-up study maybe helpful to further understand site-specific variations associated with prevailing environmental conditions. Since the study is primarily descriptive, a more scientific account or measurements of these variations is suggested for future studies to understand the relationship and degree of influence of the different environmental factors to stand formation and regeneration pattern. (Author's abstract)

**Keywords:** Forestry, Mixed stands, Pure stands, Regeneration dynamics, Regeneration patterns, Secondary forest, Silvical characteristics

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 41-42 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0355

# Strength and related properties of bagras (*Eucalyptus deglupta* Blume) and gubas (*Endospermum peltatum* Merr.) in comparison with some tree plantation species in the Philippines

Alipon, Marina A., Floresca, Apolonio R., Cayabyab, Pedro C., Cabral, Zenaida L.

1993 Industrial Between and 95. two Tree Plantation Species (ITPS), bagras (Eucalyptus deglupta Blume) collected from Aras-Asan Timber Corporation and Paper Industries Corporation of the Philippines and gubas (Endospermum peltatum Merr.) from the University of the Philippines at Los Baños were tested for their strength and related properties following the ASTM Standards for Testing Small Clear Specimens of Timber (ASTM D143-52).

Results of tests were compared with the properties of other plantation species previously tested at FPRDI.

Based on strength properties grouping set forth by the Forest Products Research and Development Institute, bagras falls under Class IV (Moderately Low Strength), while gubas under Class V (Low Strength Group). (Author's abstract)

**Keywords:** Forestry, Gubas (Endospermum peltatum Merr.), Bagras (Eucalyptus deglupta Blume), Industrial tree plantation species

NRCP Research Journal, Volume No. Issue No., 87-98 (Filipiniana Analytics) Fil(S) Q179.9 N323 v.5 1998

0356

#### Survey of trees using ArcGIS offset line and digicam tree measurement techniques Vallesteros, Shierel F., Bantayan, Nathaniel C.

An innovative tree measurement technique combined with GIS was developed as part of a GIS-based tree inventory project at UP Los Baños. The ArcGIS Offset Line and Digicam Tree Measurement Techniques were used to map and build a database for the Pili Drive, a 1.4 km road lined with Pili (*Canarium ovatum* Eng.) trees. Found at the University of the Philippines Los Baños, the road is rich with historical, aesthetic, recreational and environmental significance. Measurements of individual trees are the main information in the database. We used ArcGIS COGO (coordinate geometry) functionality to plot tree locations gathered from a line offset survey. The method allowed the survey and mapping of 234 trees by a two-man crew in just two days. For tree measurements, we demonstrated a technique we call "Digicam Tree Measurement". An ordinary digital camera was used to take photographs from where measurements of tree heights and crown diameters were derived. We found that the technique was faster (P=0.01) and easier (70% of the job is done in the office) than the usual method of tree

measurement, i.e., measuring height by abney level and tree crown by projecting crown edges to the ground. The accuracy is comparable with that of the usual method both in terms of height (P=0.64) and crown diameter (P=0.72) measurements. Added benefits include archiving of photographs for future use such as biomass change measurement. However, the techniques are suitable only for roadside and other low-density tree planting. They are very useful for management of urban trees. (Author's abstract)

Keywords: Forestry, Tree measurement technique, GIS, COGO

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 40-41 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

**GEOLOGY** 

0357

## AR\_DOSE: a PC program for stack design and the PRR-1 41Ar effluent *Leopando, Leonardo S.*

AR DOSE program written to be used a tool to verify the adequacy of is а as design the stack of the Philippine Research Reactor (PRR-1) for the routine the of <sup>41</sup>Ar release of effluent. AR DOSE **IBM**-compatible computers. runs on personal

<sup>41</sup>Ar is the only radioactive effluent released by the PRR-1 during routine operation. <sup>41</sup>Ar is produced by the neutron activation of <sup>40</sup>Ar, a stable isotope of argon present in the air and dissolved in water. There is air in the irradiation facilities of the PRR-1, and the core itself is water-cooled and submerged in a large open pool of water. The <sup>41</sup>Ar produced by the reactor is collected by drawing air from the irradiation facilities and from the small air space between the surface of the pool and a dust cover. The air is vented into the atmosphere through a stack.

The air is filtered before it is discharged, but the <sup>41</sup>Ar cannot be effectively removed by filtration, and a small exposure dose will be absorbed by the public in the long term. The maximum annual exposure dose, the maximum annually averaged <sup>41</sup>Ar concentration, and the maximum one-hour exposure dose in the unrestricted area around the reactor have to be calculated and demonstrated to be within acceptable limits.

<sup>41</sup>Ar in of the safety General Atomics (GA) calculated the rate of release analysis report it TRIGA conversion the PRR-1 (TR-86-01, prepared for of 1987), and **PNRI** attempted to calculate the exposure dose to the public from that rate of release and for meteorological data the reactor site (Palattao et al., 1989). The former calculation is not completely applicable now, because the physical configurations of the irradiation facilities and ventilation system have changed. The result of the latter calculation is in doubt because the 41Ar release rate it claimed to use is not in agreement with TR-86-01, 1987. AR DOSE was written to replace both of these calculations with one program PC. for the

AR\_DOSE is a companion program to DBA\_DOSE (The Nucleus, 1989) a program written to calculate the exposure dose from the release of fission products during the Design Basis Accident (DBA). The PRR-1 uses the same stack for DBA release as for the routine release of  $^{41}$ Ar effluent.

The source code of AR\_DOSE contains approximately 1100lines of FORTRAN-77 (written for the Microsoft Fortran 4.10 compiler) and 300 lines of Assembler. AR\_DOSE.EXE is only 50 kB in size and needs only about 54 kB of RAM to run. A math-coprocessor is not needed but will speed up runs considerably. (Author's abstract)

Keywords: Geology, AR\_DOSE, Philippine Research Reactor-1 (PRR-1), 41Ar effluent

Philippine Nuclear Journal: a publication of the Philippine Nuclear Institute, Volume No. Issue No., 47-53 (Filipiniana Analytics) Fil(S) QC173 P55 v.11 1994

#### Basic design parameters for the new PRR-1 stack Leopando, Leonardo S.

This report presents the results of work done to establish the basic design parameters of the new stack of the Philippine Research Reactor-1 (PRR-1 The work was undertaken to assure that the radioactive air emissions of the PRR-1, under both accident and normal operating conditions, will comply with modern safety practices. The work was done during June and July 1994. (Author's abstract)

Keywords: Geology, Philippine Research Reactor-1 (PRR-1., Radioactive air emissions, Basic design parameters

Philippine Nuclear Journal: a publication of the Philippine Nuclear Institute, Volume No. Issue No., 1-33 (Filipiniana Analytics) Fil(S) QC173 P55 v.11 1994

0359

#### Compaction rates and paleo-sea levels along the delta complex north of Manila Bay, Luzon Island, Philippines

Soria, Janneli Lea A., Siringan, Fernando P., Rodolfo, Kelvin S.

Uncontrolled groundwater extraction has been proposed as the main cause of accelerated subsidence in the delta region north of Manila Bay. However, natural autocompaction of deltaic sediment and other anthropogenic factors also enhance subsidence, amplitying global sea-level rise and aggravating land loss, flooding, and tidal inundation. how Here, we report we determine the longer-term subsidence rates and paleo-sealevel history of the delta plain using sediment cores. Four sediment cores 3 to 10.7 m long taken in Bocaue and Malolos, Bulacan and Lubao, Pampanga all display shoaling-upward sequences that consist of, from bottom to top: basal shallow-marine clays comprising nearly half of each core; mangrove peat; beach sand; fluvial sand and mud; and uppermost floodplain clays. Porosities of the deltaic sediments range from 0.3 to 0.8. Peat, has the highest porosities, from 0.7 to 0.8. Calculations indicate about 2 to 6 m of compaction for the whole sediment sequence. Wood fragments at 7 m and 8.4 m depths in the shallow-marine section of the Pampanga core respective ly yielded radiocarbon ages of  $1800 \pm 40$  and  $1730 \pm 40$  years. If around 1,000 years ago is when the surface 10m of sediments started compacting, they would have done so at rates of 0.2 to 0.6 cm/y. Natural compaction in similar environments such as in Po Delta, Italy and Mississippi Delta are comparable, ranging from 0.09 to 0.37 cm/y. The small values acquired in this study imply that large human-induced components may account for as much as 97 percent of the subsidence in Pampanga. (Author's abstract)

Keywords: Geology, Autocompaction, Subsidence, Paleo-sea level, Delta

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 17 Issue No. 2, 39-45 (Filipiniana Analytics) Fil(S) Q1.A3 S4 17/2 2005

## DBA\_DOSE: a PC program for stack design and the PRR-1 design basis accident *Leopando, Leonardo S.*

DBA\_DOSE is a program written to be used as a tool to verify the adequacy of the design of the stack of the Philippine Research Reactor-1 (PRR-1 under Design Basis Accident conditions. DBA\_DOSE runs on IBM-compatible personal computers.

In the Design Basis Accident, a substantial amount of fission products is released into the air inside the reactor building. The emergency ventilation system is assumed to function, creating a negative air pressure inside the building that will prevent the uncontrolled release of fission products into the atmosphere. The emergency ventilation system will drive filtered building air through a stack to create the negative pressure.

Unavoidably, some of the fission products will pass through the filter and will be discharged. The fission products will be carried by the wind beyond the reactor site and will cause some exposure of the public to radiation. DBA\_DOSE may be used to calculate the amounts of exposure dose for various stack configurations and meteorological conditions at given distances from the reactor. The exposure doses compared with acceptable may be limits.

The source code of DBA \_DOSE contains approximately 3000 lines of FORTRAN -77 (written for the Microsoft Fortran 4.10 compiler) and 300 lines of Assembler. DBA\_DOSE.EXE is only 58 kB in size and needs only about 71 kB of RAM to run. A math-coprocessor is not needed but will speed up runs considerably. (Author's abstract)

Keywords: Geology, Philippine Research Reactor-1 (PRR-1), DBA\_DOSE, Fission products, Atmosphere

Philippine Nuclear Journal: a publication of the Philippine Nuclear Institute, Volume No. Issue No., 35-46 (Filipiniana Analytics) Fil(S) QC173 P55 v.11 1994

0361

#### The development of technetium - 99m radiopharmaceuticals: technetium -99m phytate Eugenio, A.D., Mendoza, L.F., Alvarez, Ma. T., De Jesus, E.M.

A kit for scintigraphy of the reticuloendothelial system has been prepared. It provides a predispensed sterile formulation for reconstitution with sterile <sup>99m</sup>TC-pertechnetate solution. The resulting injection contains <sup>99m</sup>TC labelled phytate. Each kit consists of 3 vials and each vial contains 10 mg phytate and up to 1 mg SnCl<sub>2</sub>  $2H_2O$  in freeze-dried form. (Author's abstract)

**Keywords:** Geology, Technetium - 99m radiopharmaceuticals, Kidney imaging, Sodium glucoheptane, Stannous chloride

#### The development of technetium - 99m radiopharmaceuticals: technetium -99m phytate Eugenio, A.D., De Jesus, E.M., Salabit, Ma. T.A., Mendoza, L.F.

A kit for scintigraphy of the reticuloendothelial system has been prepared. It provides a predispensed sterile formulation for reconstitution with sterile <sup>99m</sup>TC-pertechnetate solution. The resulting injection contains <sup>99m</sup>TC labelled phytate. Each kit consists of 3 vials and each vial contains 10 mg phytate and up to 1 mg SnCI<sub>2</sub> 2H<sub>2</sub>O in freeze-dried form. (Author's abstract)

Keywords: Geology, Radiopharmaceuticals, Technetium -99m phytate, Reticuloendothelial system

NRCP Research Journal, Volume No. 3 Issue No. 2, 107-114 (Filipiniana Analytics) Fil(S) Q179.9 N323 3/2 1993

0363

#### Effects of lahar on the water quality of the rivers and tributaries of Pinatubo volcano Campita, Nora R., Tansinsin, Lilia G., Ramos, Alejandro F.

1995 to 1997 research comprised collection and geochemical analyses of water samples from rivers, tributaries and some artesian wells situated along major river channels at Pinatubo Area in Pampanga, Tarlac and Zambales to assess their water quality. Results of analyses revealed that rate of continuous leaching of highly soluble components such as sulfate  $(SO_4^{-2})$ , magnesium  $(Mg^{+2})$ , sodium  $(Na^+)$ , potassium  $(K^+)$ , chloride (CI), boron (B) and total dissolved solids from fresh lahars were greatly affected by seasonal changes. It was observed that during the onset of the rainy season, there were increases in total dissolved solids (TDS), silica and sulfate content and increases in water temperature of most of the sampled water resources. In contrast, where much rainfall occured, total dissolved solids, silica and sulfate content decreased in great extent. The gathered geochemical results depicted that for medium rate of rainfall much total dissolved solids, silica and sulfate remained in solution. High amount of rainfall caused the washing out of these constituents. Likewise, geochemical findings revealed that major constituents like total dissolved solids, magnesium, sulfate, chloride and boron decreased through time. This likely imply that there are lesser soluble minerals being leached from the lahar deposits. This phenomenon can be reflected by the pH values becoming more alkaline and the water temperatures getting cooler. However, for rivers channels which are active routes of lahars, the water temperatures are still quite high (30.3°C to 34.5°C). Likewise, their degree of siltation remains very high. Furthermore, results divulged the non-potability of most of the water resources due to their high total dissolved solids, sulfate and magnesium content. (Author's abstract)

Keywords: Geology, Lahar, Sulfate, Magnesium, Sodium, Potassium, Chloride, Boron

NRCP Research Journal, Volume No. Issue No. , 99-136 (Filipiniana Analytics) Fil(S) Q179.9 N323 v.5 1998

## Minimum detectable activity of a 5x5 NaI T1) gamma spectrometer used for the radioactivity clearance measurements of the PRR-1 decommissioning project *Agustin, Jan Aldrich A., Romallosa, Kristine Marie D.*

This paper details the Minimum Detectable Activity (MDA) of a 5x5 NaI Gamma Spectrometer intended for gross gamma-ray analysis of areas around the Philippine Research Reactor-1 (PRR-1) which is up for decommissioning. In particular, the gamma spectrometer will be used for the wide area survey of parts of the west wing of the reactor building with very low likelihood of contamination. A release criteria was compared to the MDA to determine whether the instrument is suitable to detect surface activity and for radiological clearance measurements of these PRR-1 areas. Gross gamma counting was performed for 16 hours. Results show that the mean gross background counts is 276,568 with a RSD= 1.16% and the detection limit is 2,468 counts. The computed MDA of the gamma spectrometer is 0.03 Bq/cm<sup>2</sup>  $\pm$  6% (at *k*=2, 95% *confidence level*) at 1 meter away from the wall & floor surfaces. The MDA is below the 1/10 of the clearance level as stated in the regulatory release criteria. The 5x5 NaI (Tl) Gamma Spectrometer may therefore be used for clearance measurements of some areas in the PRR -1 in order to release it from regulatory control. (Author's abstract)

**Keywords:** Geology, Minimum detectable activity, NaI detectors, Gamma spectrometry, Radioactivity measurements, Decommissioning, Clearance measurements

Philippine Nuclear Journal, Volume No. Issue No., 17-26 (Filipiniana Analytics) Fil(S) QC173 P55 v.17 2012

#### PUF\_DOSE: a PC program to calculate doses from a puff release of radioactivity Leopando, Leonardo S.

PUF\_DOSE is a program written to calculate the radiation exposure doses due to a puff release of radioactivity from a stack. PUF \_DOSE runs on IBM-compatible personal computers.

The source code of PUF\_DOSE contains approximately 4500 lines of FORTRAN-77 (written for the Microsoft Fortran 4.10 compiler) and 300 lines of Assembler. PUF\_DOSE.EXE is only 58 kB in size and needs only about 65 kB of RAM to run. A math-coprocessor is not needed but will speed up runs considerably. (Author's abstract)

Keywords: Geology, PUF\_DOSE, FORTRAN-77, Microsoft Fortran 4.10

Philippine Nuclear Journal: a publication of the Philippine Nuclear Institute, Volume No. Issue No., 55-62 (Filipiniana Analytics) Fil(S) QC173 P55 v.11 1994

#### Relative sea level changes and worsening floods in the Western Pampanga Delta: causes and some possible mitigation measures Siringan, Fernando P., Rodolfo, Kelvin S.

Despite declining rainfall, flooding continues to worsen around the northern end of Manila Bay. In Pampanga, flooding is enhanced by siltation of streams by sediments from the 1991 Mt. Pinatubo eruption, but the entire region has always been flood-prone, and Bulacan and Metro Manila, far from Pinatubo, also suffer worsening floods. Urbanization and deforestation are blamed, but have less impact than local sea level rise. Global warming causes the ocean surface to rise only 2 mm1yr; localized subsidence of the region from both natural and anthropogenic causes is an order of magnitude faster. Movements associated with faulting and the Pinatubo and Taal volcanoes probably are less important than the compaction of deltaic sediments under their own accumulating weights. All natural causes of subsidence are dwarfed by the contribution from excessive groundwater withdrawal, which greatly facilitates natural sediment dewatering and compaction. Several centimeters per year of documented subsidence at well sites have been corroborated by recent resurveys of elevation benchmarks established in the 1950s.

In the short-term, flooding can be ameliorated by restoring original channel widths and by modifying current aquaculture practices. In the longer term, reforestation should also help by increasing infiltration and decreasing erosion and siltation. Flooding will inexorably continue in the coming century, however, both from natural compaction of delta sediments and from global sea level rise. Subsidence will continue to accelerate if the use of groundwater by the growing population is not regulated and reduced. (Author's abstract)

Keywords: Geology, Rainfall, Flood, Global warming, Urbanization, Deforestation

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 2, 1-12 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/2 2003

#### Zambales ophiolite complex mafic dikes in upper mantle rock suites: distinct short-lived island arc magmatisms Datuin, Rogelio T., Yumul, Jr., Graciano P.

The residual harzburgite - Iherzolite suites as observed in the Coto and Acoje Blocks of the Zambales Ophiolite Complex are cut by numerous dikes that range in composition from diabasic to gabbroic/dioritic to pegmatitic. The diabasic dikes are dominant in the Coto Block residual harzburgites - transition zone dunites while gabbroic dikes are noted more frequently in the Acoje Block residual harzburgite - Iherzolite - transition zone dunite suite. These dikes are not related to the overlying sheeted dike - sill complexes. The spinel chemistry of both the Coto and Acoje harzburgite - Iherzolite host rocks indicates that these rocks exhibit mid-ocean ridge basalt (MORB) affinity. On the other hand, the bulk chemistry of the dikes intruded into the Coto and Acoje Block peridotites show subduction-related signatures. It can be concluded that these dikes (ISLAND ARC CHEMISTRY) are not unextracted frozen melts from their respective country rocks (MORB AFFINITY). Field distribution of these dikes and available geochemical evidences connote that these dikes are related to short-lived and distinct phases of subduction related magmatisms! (Author's abstract)

Keywords: Dioritic, Gabbroic, Diabasic, Pegmattic, Geology

NRCP Research Journal, Volume No. 1 Issue No. 1, 83-98 (Filipiniana Analytics) Fil(S) Q179.9 N323 1/1 1992

#### **HEALTH AND WELLNESS**

#### Being diabetic: symptom distress and quality of life Demayo, Cesar G., Torres, Mark Anthony J., Alfeche, Aida Christine A., Baliquig, Caren Grace Marife B., Cabilla, Jazel J., Tumampil, Kara Regina S., Jondonero, Clowe

Diabetes mellitus is an increasingly important public health concern in the Philippines. It is a disease that must be controlled over the lifetime of a person. In addition, there is a high prevalence of chronic medical complications among subjects with diabetes mellitus. It is especially prevalent in the elderly and is one of the leading causes of disability in adults over 45 years of age. In order to provide information to health care providers and professionals on the ways to facilitate self- management of patients with diabetes, this study was therefore conducted. In this study, we relied on the client's own perception of their quality of life and distress experiences with their illness. The General Health Questionnaire developed by Goldberg in the 1970's was used to measure minor psychological distress, the Diabetes Empowerment Scale was used to measure the psychosocial self efficacy of people with diabetes, the Quality of Life Index developed by Ferrans and Powers was used to to measure the quality of life in terms of satisfaction and importance of the various aspect of life and the Beck Depression Inventory created by Aaron T. Beck was used to measure characteristic attitudes and symptoms of depression in the patients. The results of the study showed that 65% of the patients do not experience any significant changes with regards to their general health status. The Quality of Life Index results showed that 73% of the respondents are very satisfied with their quality of life and 92% consider the different aspects of life as very important. The results from the Beck Depression Inventory showed that 91 % of the diabetic respondents do not have thoughts of killing themselves because of the disease. In the Diabetes Empowerment Subscale it is shown that most of the respondents know what helps them stay motivated to take care of their diabetes. Comparing the different demographic predictors of the respondents, age was shown to have a bigger impact on the Quality of Life of patients with diabetes, which implies that health care management of these patients should be highly individualized. (Author's abstract)

Keywords: Health and wellness, Diabetic, Depression, Quality of life

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 139-140 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

# Comparative antidiabetic activity determination and characterization of potentially active metabolites from the leaves of *Syzygium malacunse* (makopa) and *Momordica charantia* (ampalaya)

#### Enerva, Lorna T., Abila, Christine P., Fajiculay, Erickson E., Lavilla, Ericson S., Panganiban, Gilbert C.

Diabetes is a disease characterized by persistent hyperglycemia due to a disorder of carbohydrate metabolism. This study was undertaken to compare the hypoglycemic activity of the bioactive components extracted from the leaves of *Syzigium malacunse* (makopa) and *Momordica charantia* (ampalaya).

The dried leaves ofmakopa and ampalaya were soaked in ethanol for 5 days, filtered and concentrated. These extracts were subjected to polarity based partitioning and yielded: hexane extract as makopa hexane and ampalaya hexane, dichloroethane extract as makopa DCM and ampalaya DCM and water extract as makopa aqueous and

#### ampalaya

Ascentia Entrust Glucometer results of the hexane extract (makopa, ampalaya, dichloromethane extract (makopa, ampalaya), aqueous extract (makopa, ampalaya) yielded 50% and 66%, 64% and 45%, 51% and 22% decrease in blood glucose level respectively collected from the serum of Swiss Webster Albino mice. The extract showed significant decrease in glucose level compared to the control. The ethanol extract of each plant was subjected to the control of the control of the serum of Swiss Vebster Albino mice.

Chromatographic separation of the extract of makopa yielded five fractions as  $M_1$ ,  $M_2$ ,  $M_3$ ,  $M_4$ , and  $M_5$ . The ampalaya extract gave five fractions as  $A_1$ ,  $A_2$ ,  $A_3$ ,  $A_4$  and  $A_5$ . Ascentia Entrust Glucometer reading revealed that  $M_1$ ,  $M_2$ ,  $M_3$ ,  $M_4$ . and  $M_5$  gave 39.3%, 22.5%, 78.8%, 24.7% and 2.7% decrease in blood glucose level respectively. While the ampalaya fractions  $A_1$ ,  $A_2$ ,  $A_3$ ,  $A_4$ , and  $A_5$  gave 27%, 42%, 2.3%, 61.6%, and 42% decrease in blood glucose, respectively. The results suggested that  $M_3$  contained the most active metabolite.

Instrumental analysis by IR, UV-VIS and gc-mass spectra was made on  $M_3$ . Structural analysis and comparison with existing drugs showed that phosporothoic acid, 0,0° diethyl –(3,5,6-trichloro-2-pyridine) ester was the possible structure that accounted for the large decrease in blood glucose level of fraction  $M_3$ . The results of the study showed that makopa is more hypoglycemic than ampalaya leaves. (Author's abstract)

#### Keywords: Health and wellness, Hypoglycemia, Polar based partitioning, Chromatography, Diabetes

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 141-142 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### 0370

### Effect of household level coconut oil usage on the lipid profiles of Filipino women *Feranil, Alan B., Duazo, Paulita L., Kuzawa, Christopher, Adair, Linda S.*

There is a debate whether coconut intake adversely affects cardiovascular disease risk. This is a public health concern as well as a concern for the vegetable oil industry.

We aimed to contribute to the resolution of the existing debate on the health effects of coconut oil by examining the association between coconut oil intake and lipid profiles as indicated by total cholesterol (TC), high density lipoprotein (HDL), low density lipoprotein (LDL) and the total cholesterol to high density lipoprotein ratio (TC/HDL) of adult Filipino women . Data were collected in 2005 from a cohort of 1,732 women aged 35-69, participating in the Cebu Longitudinal Health and Nutrition Survey, a community based study in Metropolitan Cebu. Coconut oil intake was measured as per capita daily intake based on the household's weekly consumption while cholesterol and lipoprotein levels were measured in plasma samples collected after an overnight fast.

Linear regression models were used to estimate the association between individual coconut oil intake and each plasma lipid outcome, after adjusting for total energy intake, age, body mass index, fish consumption and socioeconomic status (education, assets and urban residency). Women who were older, were college educated, had larger body mass indices and were from richer and urban households had high TC levels. Coconut oil consumption was positively related to TC and HDL but unrelated to LDL and the TC/HDL ratio. These findings provide modest support for the proposal that coconut intake could yield positive health effects among Filipinos by enhancing good cholesterol (HDL). A randomized study that supplements the diet with coconut oil will be necessary to confirm that these relationships are causal. The rising burden of cardiovascular disease in the Philippines warrants such an intervention. (Author's abstract)

**Keywords:** Health and wellness, Cholesterol, Diet, High density lipoprotein, Low density lipoprotein, Cardiovascular disease

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 143-144 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Glycemic effect of betel nut (Areca catechu Linn.) fruit Pacada, Charles A.

The acceptance of unconventional medicine or the so called alternative medicine is favorable at this time because pharmaceutical drugs are increasingly becoming expensive due to worldwide economic crisis. This study attempted to assess some alternative medicines, for diabetes, from -plants that are most abundant to our native places here in the Philippines using phytochemical analysis and bioassay.

Phytochemical analysis of the extract of the fruit of the betel nut showed that alkaloids, flavonoids, triterpenes, saponins and glycosides are the constituents that are present in the extract.

Preparations of the extract of the fruit of the betel nut were done through decoction, infusion and alcohol extraction. The bioassay of the extracts showed that there is hypoglycemic effect of the different preparations of the betel nut fruit extract on the test animals (guinea pigs). Among the preparations of the extract, betel nut alcohol extract

showed a higher significant hypoglycemic effect.

Phytochemical analysis and bioassay of the fruit of the betel nut have led to the detection of hypoglycemic effect of the fruit. This study is one way to alleviate the sufferings of people who cannot afford to buy expensive medicines in the Philippines. (Author's abstract)

Keywords: Infusion, Bioassay, Decoction, Hypoglycemic effect, Health and wellness, Phytochemical analysis

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 145-146 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Hypoglycemic activity determination and characterization of potentially active metabolite(s) from the root crop *Smallantus sonchifolius* (yacon)

Enerva, Lorna T., Malaborbor, Pastor B., Alegria, Melissa O., Reniva, Christofer R., Seboline, Aldwin, Tan, Cheriss

Smallantus Sonchifolius (yacon) is a perennial herb, classified under the Asteraceae family. Each plant formsunderground clump of 4 to 20 fleshy large tuberous roots. This study was undertaken to determine the hypoglycemicpropertyofyacontubers.

One thousand five hundred grams of yacon tubers were air-dried, homogenized, and percolated with 1.5 litters of methanol for one week and rota-evaporated. Forty ml of the extract was dissolved in 20ml distilled water and subjected to polarity-based participation with hexane and ethyl acetate. The extracts were concentrated and subjected to bioassay to test for their hypoglycemic activity. The semi-crude ethyl acetate extract was purified by column

chromatography, characterized by infrared spectra, ultraviolet and gas chromatography-mass spectra analysis.

The hypoglycemic property was confirmed using an Ascentia Entrust glucometer. The experimental design of the 4 groups of mice consisted of the (+) control group, (-) control group, ethyl acetate extract group, hexane and pure extract juice of vacon. The mice were orally fed with 0.4 ml of 35% glucose solution and the blood glucose levels were read at 0, 30, 60 and 90 minutes. The ethyl acetate extract had an initial reading of 20.27, 11.9, 10.23 and 5.92, respectively. While the hexane extract had an initial reading of 20.5, 21.06, 17.9 and 13.23, respectively. The pure extract had an initial reading of 21.3, 14.9, 12.1 and 10.65. respectively.

The infrared spectra revealed the presence of carboxylic acid, aromatic and aliphatic groups. Ultraviolet spectroscopy analysis of the semi-pure isolate had a maximum wavelength at 316 nm with an absorbance of 2.042 and the minimum wavelength at 202nm at 6.045. Gas chromatographymass spectra analysis revealed the presence of 7,10-octadecadienoic acid, methyl ester, 9,10-secoholesta-5,7,10(19)- triene, 3,24,25,-triol (3a, 5z, 7E) and 1,2 benzenedicarboxylic acid, diisooctyl ester.

Yacon had a hypoglycemic action which can be used as a food for diabetics and can be used as a substitute for expensive drugs. (Author's abstract)

Keywords: Health and wellness, Hypoglycemic, Diabetes, Infrared spectra, Ultraviolet spectra, GC-mass spectra

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 142-143 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0373

## Marine copepods: a potential rich source of omega-3 polyunsaturated fatty acids, a dietary supplement for healthy aging *Metillo, Ephrime B.*

Aging gracefully may be traced back to a healthy youth. Omega 3 polyunsaturated fatty acids (PUFA) playa major role in healthy functioning of immune, central nervous and cardiovascular systems from fetal age to older years. Omega 3 PUFAs are now regularly prescribed to pregnant women for normal fetal central nervous functioning, and to the elderly for healthy cardiovascular and nervous systems. This study was aimed to screen for PUPA and culture marine copepods from northern Mindanao coastal waters. Screening microscopic (0.1 to 1.5mm average total length), shrimp like animals, called copepods from the northern coastal waters revealed very promising amounts of PUPA. Out of the 43 identified species, a preliminary PUFA analysis of a very common species, *Acartia erythraea*, revealed relatively large amounts of the three PUPA of interest. The concentrations of arachidonic acid (ARA), eicosapentaenoic acid EPA, and docosahexaenoic acid (DHA) are 0.9%, 1.4%, and 13.4%, respectively. Optimization of culture conditions of copepods is currently being developed with the goal of mass producing omega 3-rich copepods not only for the food supplement but for the aquaculture industry as well. (Author's abstract)

Keywords: Health and wellness, Crustacea, Marine copepoda, PUFA, Omega 3, Healthy aging

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 146-147 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

### Physical activity, energy requirements and adequacy of dietary macro- and micronutrient intakes of older persons in a rural Filipino community

Risonar, Maria Grace D., Rayco-Solon, Pura, Ribaya-Mercado, Judy D., Solon, Juan Antonio A., Cabalda, Aegina B., Tengco, Lorena W., Solon, Florentino S.

**Background:** Aging is a process associated with physiological changes such as in body composition, energy expenditure and physical activity. Data on energy and nutrient intake adequacy among older individuals is important for disease prevention, health maintenance and program development. Objective: To determine the energy requirements and the adequacy of energy and nutrient intakes of older persons living in private households in a rural Filipino community. Design: Descriptive cross-sectional study. Subjects: Generally-healthy, ambulatory, coherent and free-living elderly aged 60-100 y (n=98), 88 of whom provided dietary information in three non-consecutive 24hour food recall interviews. **Results:** There was a decrease in both physical activity and food intake with increasing years. Based on total energy expenditure and controlling for age, gender and socioeconomic status, the average energy requirement for near-old (>60 to <65 y) males was 2074 kcal/d, with lower requirements, 1919 and 1699 kcal/d for the young-old (>65 to <75 y) and the old-old (>75 y), respectively. Among females, the average energy requirements for the 3 age categories were 1712, 1662, and 1398 kcal/d, respectively. Actual energy intakes, however, were only ~65% adequate for all older persons. The intakes of protein, fat, and micronutrients (vitamins A and C, thiamin, riboflavin, iron and calcium) were only ~24-51 % adequate. Among this population, there was a weight decrease of 100 g (P=0.012) and a BMI decrease of 0.04 kg/m2 (P=0.003) for every 1 % decrease in total caloric intake adequacy. Conclusion: These free-living elderly participants suffer from both macro- and micronutrient malnutrition. Their intakes of energy are ~65% of the amounts required based on their total energy expenditures, and their intakes of selected vitamin and mineral nutrients do not meet the Philippine dietary recommendations. (Author's abstract)

Keywords: Health and wellness, Elderly, Energy expenditure, Energy requirements, Dietary intake, Physical activity

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 147-148 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0375

#### Treatment outcomes of pulmonary TB patients enrolled at the Unilab-DOTS Center Ortiz, Sheila M., de Castro-Ontengco, Delia

UNILAB-DOTS Center, the first and only DOTS Center established and operated by a pharmaceutical company offering actual supervision of tuberculosis (TB) therapy to patients in the Philippines, was chosen as one of the five private-public mixed DOTS (PPMD) models in the country through a three-year project in support of PPMD funded by the USAID through the Centers for Disease Control (CDC), Atlanta, Georgia and the Philippine Coalition Against Tuberculosis (PhilCAT).

This study evaluated the treatment outcomes and success rate among sputum smear-positive patients enrolled at UNILAB-DOTS Clinic from 2004-2007. Screening of subjects entailed a positive chest x-ray and new positive smears. A total of153 TB patients were enrolled over four years: 35 in 2004; 28 in 2005; 38 in2006; and for 2007, 52.

Following the guidelines set by the World Health Organization (WHO), CDC, and the National TB Program of the Philippines for DOTS Centers, screening procedures, laboratory diagnosis, and treatment protocols were performed: management of patients at the UNILAB-DOTS Center and the Acid Fast Ziehl Neelsen Method at the Health First Clinic of UNILAB. Treatment success rates were: 97.2%, 92.9%, 84.2%, and 86.5% for 2004-2007, respectively. The following factors contributed to the low rates in 2006-2007: default, failure, and transferred out. Using sensitivity analysis and assuming that those who transferred out were able to continue their treatment and

achieved success, results suggest that for year 2006 treatment success rate would be 94.74% and for year 2007, 92.31 %.

UNILAB-DOTS Center has met the WHO global target of 85% treatment success rate for new TB smear positives across the years. Though there were some transferred-out patients we are hopeful that with the implementation of this DOTS program in the Barangay Health Centers, success rates would go on escalating. (Author's abstract)

Keywords: Health and wellness, Tuberculosis, Directly observed treatment short course, Treatment success

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 140-141 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

INDUSTRY

0376

#### Galactomannan from Makapuno: another amazing coconut product Batalon, Joh

The PCARRD monitored project on isolation, characterization and utilization of galactomannan from coconut through the Philippine Coconut Authority - Albay Research Center had developed a method of isolating the substance from makapuno which offers greater opportunity for industrial production. Galactomannan or Mark gum is used as a raw materials for the production of biodegradable films and utilized as wound gauze or wrapping materials for food products. Mak gum had also been used as an ingredient in the production of hand sanitizer as well as substitute for or combined with agarose or polyacrylamide for electrophoresis laboratory analysis. The other potential uses of galatomannan can be possible with sufficient support for further research.

Keywords: Industry, Galactomannan, Makapuno, Mak gum

The PCARRD Monitor, Volume No. 36 Issue No. 1, 9, 16 (Filipiniana Analytics) Fil(S) S19 P86 36/1 2008

#### Nucleonic gauges in Philippine industry: current application Pedregosa, R.V., Cayabo, L.B., Leopando, L.L.

Nucleonic gauges have been used in the Philippine industries for more than thirty years. There are now close to 500 units being used to determine and / or control level, density, concentration, weight and other parameters. Gauges are found in the food, cement, mineral processing, steel, paper, cigarette, plastic and construction industries. (Author's abstract)

Keywords: Industry, Nucleonic gauges, Density, Concentration, Weight

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No. , 285-290 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

#### Radiation processing: a versatile technology for industry Cabalfin, Estelita G., dela Rosa, Alumanda M.

Soon after the discovery of x-ray in 1895 and radioactivity in 1896, it was recognized that ionizing radiation can modify the chemical, physical and! or biological properties of materials. However, it was only in the late fifties, when large radiation sources became available, had this unique property of radiation found industrial applications i1J. radiation processing.

Today, radiation processing has been used by industry in such diverse applications, such as radiation sterilization! decontamination of medical products, pharmaceuticals, cosmetics and their raw materials; radiation crosslinking of wire and cable insulation; production of heat shrinkable materials and polymer foam; and radiation curing of coatings, adhesives and inks on a wide variety of substrates.

In addition to being a clean environment-friendly technology, radiation processing can also be used for the conservation of the environment by such processes as radiation treatment of flue gases to remove  $SO_2$  and  $NO_x$  and disinfection of sewage sludge.

Because of the many advantages offered by radiation processing, industry is showing strong interest in the technology as evidenced by the growing number of industrial radiation facilities in many countries. (Author's abstract)

**Keywords:** Industry, X-ray, Radioactivity, Ionizing radiation, Chemical properties of materials, Physical properties of materials, Biological properties of materials

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No. , 317-324 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

#### MARINE SCIENCE

0379

## Some aspects of the reproduction in the elongate sunset clam, *Gari elongata* (Lamarck 1818) from Banate Bay Area, West Central Philippines Nabuab, Fenelyn M., del Norte-Campos, Annabelle G.C.

The elongate sunset clam, *Gari* (*Gabraeus*) *elongata* (Lamarck 1818) is one of the commercially important invertebrates in Panay Island. The reproductive biology of this species from the Banate Bay Area, Panay Island, West Central Philippines was studied over one annual cycle. Elongate sunset clams were gathered monthly every last quarter of the lunar phase from September 2004 to August 2005. The shell length at first maturation, the sex ratio and the spawning periodicity were determined. The different stages of the reproductive cycle were characterized by histological examination. Seven distinguishable gonad stages were determined in both male and female clams

namely, immature, early and late developing, mature, partially spawned, redeveloping and spent. Indeterminate gonads were also noted. *Gari elongata* is a dioecious species but in a few specimens hermaphroditism was observed. It exhibits no sexual dimorphism. The male to female ratio is 1:1.04. Sexual maturity is attained at 45.40 mm SL in the male and 44.80 mm SL in the female. It is therefore recommended that clams smaller than these sizes should not be collected to allow recruitment and proper sustainability of the resource. Based on the GSI and Index of Sexual Maturity elongate sunset clams have a protracted or continuous breeding period. Sexual activity is highest during the wet season while gamete development occurred during the preceding dry season. The latter is supported by higher phytoplankton densities. (Author's abstract)

**Keywords:** Marine science, Gari (Gabraeus) elongata (Lamarck 1818), Reproductive biology, Gonad stages, Dioecious, Protracted breeding season, Phytoplankton density

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 18 Issue No. 2, 34-46 (Filipiniana Analytics) Fil(S) Q1.A3 S4 18/2 2006

0380

#### Bathymetry and hydrobiology of Lake Mahagnao, Leyte

Francisco, Ruben A., Pundavela, Menchie R., Granali, Justerie M., Tumabiene, Lea A., Alpino, Julius P., Elmido, Visitacion V.

Lake Mahagnao in Burauen, Leyte (100 52.15' Nand 1240 51.32' E) lies 26 m above sea level. It is surrounded by a mountain range that includes a dormant twin volcano. A bathymetric survey established 122 sampling stations using Global Positioning System. The stations formed transect lines across the lake. A bathymetric map of Lake Mahagnao was generated with the use of the SURFER software. Lake Mahagnao has a shoreline of 15,590 m and surface area of 15.75 ha. The deepest portion of the lake is 18.75 m. The mean pH of the water is 6.58; water surface temperature, 270C; and water visibility, 1.64 m. Eighty-one species were identified as primary producers. Station 5, the deepest portion of the lake, had the highest phytoplankton density at 4,716 cells/ml and Station 2 had only 634 cells/ml. Cyanobacteria were the most abundant in all the sampling stations. (Author's abstract)

Keywords: Marine science, Bathymetry, Hydrobiology, Cyanobacteria, Global positioning systems

Conservation and ecological management of Philippine Lakes in relation to fisheries and aquaculture, Volume No. Issue No., 41-47 (Filipiniana Analytics)

Fil(B) SH1 C74 2001

0381

#### Development of a simple biological model of vertical phytoplankton distribution Primavera, Karlo, San Diego-McGlone, Maria Lourdes, Villanoy, Cesar

Phytoplankton in tropical waters aggregate and form a maxima below the surface where the common limiting materials for growth (light from the surface, nutrients from the depths) are at optimal levels. The location of optimum growth conditions is dependent on various physical, chemical and biological factors. The formation of phytoplankton maxima was simulated through a coupled physical and biological model for vertical chlorophyll distribution in Philippine waters. This paper evaluates biological models and the significance of 1) different forms of phytoplankton response to irradiance and nutrient uptake, 2) rate of nutrient uptake, and 3) light and/or nutrient

limitation determining nutrient uptake. Phytoplankton response-to-irradiance form is less important than rate of light extinction in affecting the deep chlorophyll maximum (DCM) depth. The Michaelis-Menten form of nutrient uptake gives a bigger and deeper DCM but only under certain conditions. Temperature does not significantly affect nutrient uptake gives bigger and deeper DCMs. These findings will come in handy in future work of simulating empirical chlorophyll profiles. (Author's abstract)

**Keywords:** Marine science, Deep chlorophyll maximum (DCM) depth, Phytoplankton, Physical factors, Chemical factor, Biological factor

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 18 Issue No. 1, 43-52 (Filipiniana Analytics) Fil(S) Q1.A3 S4 18/1 2006

0382

#### Ecosystem-based approach to aquaculture management White, Patrick, San Diego-McGlone, Maria Lourdes

Ecosystems have real thresholds and limits which, when exceeded, can affect major system restructuring. Once thresholds and limits have been exceeded, changes can be irreversible. Diversity is important to ecosystem functioning. The ecosystem approach is a strategy for the integrated management of land, water, and living resources that promotes conservation and sustainable use in an equitable way. The application of the ecosystem approach will help to reach a balance of the three main objectives: conservation, sustainable use, and a fair and equitable sharing of the benefits and use of the natural resources. Aquaculture development needs to be within the carrying capacity of the water resource so that it is sustainable and does not greatly impact the environment. The determination of the carrying capacity needs to be science-based. The planning of development in ecosystems has been done for freshwater ecosystems within the PAMB (protected Area Management Board) framework, but in many cases this does not give the correct significance to the impact of aquaculture on the water resources in the ecosystem. It also needs to be extended to river basins and estuaries, brackishwater areas, and inland bays, and seas. The planning and management of aquaculture needs to be undertaken at the local government unit (LGU) level in a coordinated manner by all the LGUs that have a part of the water resource. The co-management of aquaculture, in terms of monitoring of the environment, monitoring of production, and monitoring of licenses, needs to be funded out of license fees and noncompliance fines collected by the LGUs. A number of these management activities need to be undertaken jointly (monitoring the environment) and others separately but in a coordinated manner (e.g., checking licenses and checking compliance). (Author's abstract)

Keywords: Marine science, Aquaculture, Ecosystem, Management

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 20 Issue No. 2, 1-10 (Filipiniana Analytics) Fil(S) Q1.A3 S4 20/2 2008

0383

## Environmental and production survey methodology to estimate severity and extent of aquaculture impact in three areas of the Philippines

Palerud, Rune, Christensen, Guttorm, Legovic, Tarzan, White, Patrick, Regpala, Regie

The project "Environmental Monitoring and Modelling of Aquaculture in the Philippines" known as EMMA, was undertaken by the National Integrated Fisheries Technology Development Centre (NIFTDC) of the Bureau of Fisheries and Aquatic Resources (BFAR) and Akvaplan-niva AS of TromsÃ, Norway. The project was funded by the Norwegian Agency for Development Cooperation (NORAD). This project tested survey equipment for the monitoring of aquaculture impact to the water column and sediment. Baseline surveys were undertaken as the goal of the study was develop to suitable aquaculture monitoring techniques and adapt predictive models to assist in identifying risk areas for aquaculture and allow planned development of sustainable aquaculture. Three different locations were chosen as case studies - Bolinao, Pangasinan (marine site), Dagupan (brackish water site), and Taal Lake (freshwater site). Production surveys were also undertaken to estimate production and nutrient outputs to the water bodies in order to be able to link aquaculture production with severity and extent of impacts. Different methodologies for the estimation of production were tested to find a cost effective and accurate methodology. (Author's abstract)

Keywords: Marine science, Marine site, Brackish water site, Freshwater site

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 20 Issue No. 2, 23-30 (Filipiniana Analytics) Fil(S) Q1.A3 S4 20/2 2008

0384

#### Focal benthic mollusks (Mollusca: Bivalvia and Gastropoda) of selected sites in Tubbataha Reef National Marine Park, Palawan, Philippines Dolorosa, Roger G., Schoppe, Sabine

The study was conducted at Tubbataha Reef National Marine Park from May 6-11, 2005. Seven pre-established stations with survey sites at 5 and 10m depth and one intertidal area were assessed using 150m permanent belt transects. Focal benthic mollusks found one meter to the left and right of transects were identified and counted. A total of 19 species belonging to eight families were recorded, of which 15 species are univalves. In the intertidal area a total of 12 species were noted, 13 species at the shallow (5m) and five species at deeper (10m) areas. Species belonging to the family Tridacnidae and Trochidae were the most abundant. Among the subtidal stations, the highest number of individuals was noted at a shallow reef flat (station VI). In terms of density, the intertidal area ha.d the highest (213,310 ind.  $\text{km}^{-2}$ ) followed by the shallow (72,870 ind.  $\text{km}^{-2}$ ) and the deep with 5,720 ind.  $\text{km}^{-2}$ .

The densities of *Tridacna crocea* (133,330 ind km<sup>-2</sup>) and *Hippopus hippopus* (3,330 ind. km<sup>-2</sup>) at the intertidal area were found to be higher than in most other survey sites in Palawan but previous density records at the park indicate a stiff decline. On the contrary, the first record on the density of *T squamosa* (950 ind. km<sup>-2</sup>) at the park is much lower compared to that from other parts of Palawan. Large and commercially valuable gastropods like, *Trochus niloticus, Tectus maculatus* and *T pyramis* that are rarely encountered at the intertidal areas were abundant at the TRNMP. Other important species like *Tridacna gigas, Charonia tritonis* and *Cassis cornuta* were not encountered at the study sites. To fully assess the abundance of focal mollusks, permanent transects should be established in the same seven sites but in shallow reef flat of about 2 m deep, in the lagoon and in the intertidal of North and South Islets where species composition, density and growth could be monitored on an annual basis which could be used to evaluate the management effectiveness at the TRNMP. (Author's abstract)

Keywords: Marine science, Bivalves, Focal species, Gastropods, Palawan, Philippines, Tubbataha Reef
#### Lake Lanao: its past and present status Rosagaron, Roman P.

Geographically located in Central Mindanao, Lake Lanao is the second largest lake in the Philippines. The lake is famous locally for its various uses and internationally for its endemic cyprinids. This paper intends to inform the local leaders and the national planners about Lake Lanao's dwindling fisheries resources, the extinction of some endemic cyprinids, and the current interventions as well as suggested action plans to increase fish production and to conserve the remaining species in the lake. The past and present studies on the lake are also reviewed. Early and latest statistics on the lake's fisheries production are presented to invite the interest of all sectors in coming up with the integrated approach to protect, conserve and increase its fisheries production. Local and national interventions to conserve and increase fisheries production are discussed. These include the setting up of BFAR Fisheries Station in Kialdan, Marantao; the establishment of a fish hatchery in Poona, Marantao by Southern Philippines Development Authority; the formation of Save Lake Lanao Movement by the local leaders; the creation of Lake Lanao Research and Development Council; the current concern of Philippine Council for Aquatic and Marine Research and Development-DOST; and the extension and research and development thrusts of the Mindanao State University, College of Fisheries in Marawi City. (Author's Abstract)

Keywords: Marine science, Lake Lanao, Endemic cyprinids, Fish production, Fisheries resources

Conservation and ecological management of Philippine Lakes in relation to fisheries and aquaculture, Volume No. Issue No. , 29-39 (Filipiniana Analytics)

Fil(B) SH1 C74 2001

0386

# Managing 'Sinarapan' *Mistichthys luzonensis* Smith in Lake Buhi, Camarines Sur: insights from its biology and population dynamics *Soliman, Victor S., Sergio, M.F. Hassan A.*

The population dynamics and related aspects of the biology of 'sinarapan' *Mistichthys luzanensis* Smith, the world's smallest commercial fish, are used as basis in formulating management strategies for this goby in Lake Buhi, Camarines Sur. Mesh size limit (4.1mm) and catch limit, estimated through length-based analytic fishery methods, are proposed. Yield-per-recruit analysis using length-frequency data for 11 months provided the quantitative indices used in estimating fishing limits. Closed season for 'sinarapan' was established from temporal pattern of recruitment and the reproductive biology of the species. Much of the data on 'sinarapan' came from studies in Lake Manapao. To improve the recruitment success of 'sinarapan', a habitat enhancement scheme in Lake Buhi is hereby recommended. (Author's abstract)

Keywords: Marine science, Mistichthys luzanensis Smith, Lake Buhi, Camarines Sur, Habitat enhancement scheme

#### A model to estimate aquaculture carrying capacity in three areas of the Philippines Legovic, Tarzan, Palerud, Rune, Christensen, Guttorm, White, Patrick, Regpala, Regie

A model was developed to estimate the production carrying capacity of water bodies based on nutrient inputs from aquaculture and other sources, flushing rates, and the risk of algal blooms for three different areas of the Philippines - Bolinao (marine site), Dagupan (brackishwater site) and Taal Lake (freshwater site). The results suggest that aquaculture production in the Taal Lake was greater than the sustainable carrying capacity. Aquaculture structures in Bolinao were close to carrying capacity during average tidal exchange but greater than the carrying capacity during low tidal exchange and no winds. Aquaculture production in the Dagupan estuary has not overcome its carrying capacity even during low flow. However, during very low flow and no tidal flushing, carrying capacity has been overcome. (Author's abstract)

Keywords: Marine science, Marine site, Brackish water site, Freshwater site

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 20 Issue No. 2, 31-40 (Filipiniana Analytics) Fil(S) Q1.A3 S4 20/2 2008

### A modelling of eutrophication in Laguna de Bay as a tool for rational resource management Santiago, Alejandro E., Mitsumoto, Ikuro

A lake model originally developed for Shin-Nippon Meteorological and Oceanographical Consultants Co., Ltd (METOCEAN) was used with modification to simulate the water quality of Laguna de Bay. The METOCEAN model made use of the 1984 meteorological and water quality data collected from different local government agencies. Hydraulic modeling was applied to obtain basic circulation patterns which the water quality modeling was based upon. Results of the hydraulic modeling suggests that steady backflow of saltwater from Pasig River reaches deep inside the bottom layer of the lake although the lake water flows out through the Pasig River. Thus, the water quality model for Laguna de Bay focused on the unique role of the salt water intrusion in limiting phytoplankton productivity. The effect of saltwater intrusion was simplified as the change of depth of euphotic zone in the lake water estimated from the Secchi disc transparency. For simplicity and expandability of the model as a predicting tool, Secchi disc transparency was the only forcing function considered in the study.

Modelling resolution of water quality has 4 boxes horizontally and 3 levels vertically. Calibration of the water quality model was carried out by running the model repeatedly until satisfactory agreement with measured data was obtained under average wind condition (Eastern wind, 1.5 m/sec.) Other wind directions including no wind condition were also tested to see the effect of wind on water quality. Validation of the water quality model was done for 1985 to 1988 as continuing simulation from the calibration in 1984 under the average wind condition. Then simulation of the condition of the lake from 1991 to 1995 based on the 1984 data used in the calibration was tried changing only the Secchi disc transparency data.

Initial results of the water quality model differentiated conditions with and without saltwater intrusion. Without saltwater backflow, higher concentration of total inorganic nitrogen and inorganic phosphorus and low dissolved

oxygen especially in the bottom layer are predicted. Under this condition, release of large amounts of nutrients in the sediments is expected to be dominant source of total inorganic nitrogen in the lake. The study is the first attempt to model the lake. The model still needs calibration and validation with measured values of recent years before adapting its usefulness as a tool for predicting water quality of Laguna de Bay. (Author's abstract)

Keywords: Marine science, Rational resource management, Phytoplankton productivity, Saltwater, Eutrophication

Conservation and ecological management of Philippine Lakes in relation to fisheries and aquaculture, Volume No. Issue No., 49-73 (Filipiniana Analytics) Fil(B) SH1 C74 2001

0389

#### Movement of water across passages connecting Philippine inland sea basins Meñez, Lambert Anthony B., Villanoy, Cesar L., David, Laura T.

Advection of Pacific water to the inland seas is through a number of straits bordering the archipelago. Movement of water was demonstrated by temperature-salinity diagrams plotted for a number of stations situated along the various passages. As water from the Pacific flowed through the straits its characteristic T-S profile was modified as it mixed with waters of different properties. This was best seen along the San Bernardino-Verde Island transect where strong surface flow during the NE monsoon resulted in separation of profiles at the surface indicating dilution as water moved away from the source. For deeper water, the erosion of the subsurface salinity minimum and maximum representing the core of the intermediate waters showed transport. These waters were restricted by shallow sill along the eastern coast of the country and limited to a depth of 441 m by the sill across the Mindoro Strait. (Author's abstract)

Keywords: Marine science, Temperature, Salinity, Water mass, Inland sea, T-S profile, Water transport

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 18 Issue No. 2, 10-17 (Filipiniana Analytics) Fil(S) Q1.A3 S4 18/2 2006

0390

#### Parasitic crustaceans in fishes from some Philippine lakes Lopez, Nellie C.

Parasitic crustaceans are among the most harmful parasites of fishes. Certain species cause disease outbreaks and mortalities in aquaculture, facilities, and sometimes in natural systems, resulting in serious economic losses. Edible fishes from some Philippine lakes also show infestation by parasitic crustaceans. The branchiuran, *Argulus indicus* Weber, and the copepod, *Lernaea cyprinacea* Linnaeus, were recovered from the skin and base of the dorsal fin, respectively, of the mud fish *Channa striata* from Laguna de Bay. *L cyprinacea* was also found on the white goby *Glossogobius giurus* in Naujan Lake. In La Mesa Reservoir, the gills of wild populations of tilapias *Oreochromis niloticus* and *Tilapia zillii*, white goby, and silvery theraponid *Therapon plumbeus* were infected with the copepod, *Ergasilus philippinensis* Velasquez. An isopod, *Alitropus typus* Edwards, was recovered from the buccal and gill cavities of several fishes from Lake Taal, namely; the mud gudgeon *Ophiocara aporos*, cardinal fish *Apogon thermalis*, silvery theraponid, and cage cultured *Oreochromis niloticus*. Previous reports and above finding indicate wide host specificity of the parasites. Of these four parasites, only *Ergasilus philippinensis* has not been reported to

cause mass mortality in cultured fishes. Measures should be undertaken to prevent their introduction to other water bodies in which they do not yet occur. (Author's abstract)

**Keywords:** Marine science, Parasitic crustaceans, Argulus indicus, Lernaea cyprinacea, Channa striata, Therapon plumbeus, Apogon thermalis

Conservation and ecological management of Philippine Lakes in relation to fisheries and aquaculture, Volume No. Issue No., 75-79 (Filipiniana Analytics) Fil(B) SH1 C74 2001

0391

# A post-tsunami assessment of coastal living resources of Langkawi Archipelago, Peninsular Malaysia

Lee, L. Y., Affendi, Y. A., Tajuddin, B. H., Yusuf, Y. B., Kee Alfian, A. A., Anuar, E. A.

Rapid and detailed post-tsunami surveys carried out in the Langkawi archipelago in January 2005 showed that the coral reefs d id not suffer any significant structural damage. Nevertheless, there were signs of recent sediment resuspension at the sites studied. The diversity and abundance of coral reef fishes and invertebrates were low. However, this was not attributed to the tsunami effect but rather to the present environmental conditions. The extent of damage at the villages of Kubang Badak and Kuala Teriang may indicate that intact coastal ecosystems such as mangroves have the potential to protect lives and property during natural disasters (Author's abstract)

**Keywords:** Marine science, Tsunami, Coral reefs, Invertebrates, Reef check method, Line intercept transect (LIT) method

NAGA, WorldFish Center Quarterly, Volume No. 28 Issue No. 1-2, 17-22 (Filipiniana Analytics) Fil(S) SH1 I81 28/1-2 2005

0392

# Preliminary results on the use of clay to control *Pyrodinium* bloom: a mitigation strategy *Padilla, Larry V., San Diego-McGlone, Maria Lourdes, Azanza, Rhodora V.*

The frequent and expanded occurrence of *Pyrodinium bahamense* var *compressum* blooms in the Philippines since 1983 has prompted the need to find mechanisms to control the harmful effects of these toxic dinoflagellates. A promising method now being explored is the use of powdered clay minerals which when added to the growth media is capable of flocculating with the algal cells. In this study, the efficiency of ball clay, brown bentonite, and Malampaya Sound sediments to remove *Pyrodinium* cells in seawater was tested. The addition of 1 g/L of suspended ball clay to 50 mL of cultured *Pyrodinium* cells (~ 1.037 x  $10^6$  cells/L) removed 99.56% of the algal cells after 2.5 hours. Prolonging the exposure time to 5 and 24 hours showed no significant increase in flocculation . Brown bentonite and Malampaya Sound sediments showed low to moderate removal efficiency not exceeding 70% and 50%, respectively. The effect of ball clay addition on seawater chemistry showed no change in ammonia concentration but nitrate decreased after 5 and 24 hours of clay addition. Results for nitrite and phosphate were however more variable. (Author's abstract)

**Keywords:** Marine science, Pyrodinium bahamense var, Clay, Brown bentonite, Malampaya sound sediments, Nitrite, Phosphate

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 18 Issue No. 1, 35-42 (Filipiniana Analytics) Fil(S) Q1.A3 S4 18/1 2006

0393

### Recommendations for practical measures to mitigate the impact of aquaculture on the environment in three areas of the Philippines White, Patrick, Palerud, Rune, Christensen, Guttorm, Legovic, Tarzan, Regpala, Regie

An assessment of the severity and extent of aquaculture impact and the estimation of sustainable carrying capacity were undertaken in three areas of the Philippines - Bolinao (marine site), Dagupan, (brackishwater) and Taal Lake (freshwater). This paper describes the potential mitigating measures that could be taken to reduce nutrient release from aquaculture, increase nutrient uptake using extractive species, and possible early warning systems for critical states of the tide when there is reduced flushing. (Author's abstract)

Keywords: Marine science, Marine site, Freshwater site, Brackish water site

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 20 Issue No. 2, 41-48 (Filipiniana Analytics) Fil(S) Q1.A3 S4 20/2 2008

0394

# The relevance of governance institutions in marine protected area design and management: lessons from Northeastern Iloilo, Philippines *Fernandez, Jr., Pepito R.*

The experience of the Philippines on decentralized marine protected area (MPA) management can provide an instructive purview of nature-society processes and politics of scale in a post-colonial and tropical marine fisheries setting. This paper examines and analyzes the comparative advantage and limitations in adopting government regulation, community-based initiatives and co-management arrangements (i .e., rules) in designing and implementing MPAs to meet conservation and livelihood goals. The theoretical discussion will be enriched by providing relevant contextual factors (i.e., biophysical setting, community attributes and institutional setting) from secondary literature and social science field data gathered from March to December 2005 in various coastal municipalities in Northeastern Iloilo Province, Philippines. The study site contains 17 MPAs established between 1994 to 2004 with diverse backgrounds and profiles, and are governed by various alliances (state and/or non-state actors) in different scales (i .e., local to international). The paper will argue that no single institutional arrangement is likely to be effective in addressing all the circumstances surrounding MPA design and implementation. But in the milieu of a depleted natural resource base, and the continued deterioration of the livelihood and health of poor people, environmental protection of MPAs and municipal fishing grounds of subsistence fishers should be prioritized by various actors and policy networks. (Author's abstract)

**Keywords:** Marine science, Marine protected area (MPA), Community-based initiatives, Co-management arrangements

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 18 Issue No. 1, 18-34 (Filipiniana Analytics) Fil(S) Q1.A3 S4 18/1 2006

# Review of the biodiversity of Southern Philippine Seas *Alcala, A.C., Ingles, J.A., Bucol, A.A.*

The marine biodiversity of the four seas in southern Philippines, namely, the Moro Gulf, the Davao Gulf, the Sarangani Bay, and the Sulawesi Sea, was reviewed. The biodiversity in the shallow marine waters is similar to those in other parts of the country. The biodiversity is also in a similar conservation status, that is, in various degrees of depletion. But it is possible that there are marine species that are unique to these seas. This is especially true of the Sulawesi Sea, which is characterized by great variation in terms of habitat and depth. The importance of the resources in the four seas lies in the contributions of some species, such as tuna fishes, to the livelihoods of coastal population in the area. (Author's abstract)

Keywords: Marine science, Marine biodiversity, Shallow marine waters, Habitat, Depth

The Philippine Scientist, Volume No. Issue No., 1-61 (Filipiniana Analytics) Fil(S) Q1 J95 v.45 2008

0396

### The scientific basis of marine fish farm regulation Black, Kenneth D., Cromey, Christopher J.

As aquaculture expands, regulation to prevent environmental damage is an essential requirement for sustainability. In this paper, we discuss three aspects of aquaculture regulation pertaining to 1) protection of other resource users, 2) protection of ecosystem structure (conservation), and 3) protection of ecosystem function (recycling). Some of the approaches taken to regulation of aquaculture in several countries are presented, emphasizing the need for these to be based firmly in a good scientific understanding of the ecosystem and the processes by which it interacts with aquaculture. (Author's abstract)

**Keywords:** Marine science, Protection of other resource users, Protection of ecosystem structure (conservation), Protection of ecosystem function (recycling)

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 20 Issue No. 2, 11-22 (Filipiniana Analytics) Fil(S) Q1.A3 S4 20/2 2008

#### SEAFDEC contribution to the ecological awareness of Philippine Lakes *Platon, Rolando R.*

Since 1976 the Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC/AQD), through its Binangonan Freshwater Station has been continuously involved in research on various aspects of inland waters, with emphasis on Laguna de Bay. Lakes Paoay, Taal, Sampaloc and Naujan have also been studied to a limited extent. Research efforts focused on monitoring activities of various biological and physico-chemical parameters in the lake; pollution studies; improvement of practices towards an environmentally sound and sustainable aquaculture enterprise; socio-economic impacts of aquaculture on lakeshore communities and other related activities. The Department has been actively collaborating with various national and international agencies as well as non-government organizations in its effort, to improve its research capabilities. The research results have been published in both local and international scientific journals and proceedings. (Author's abstract)

**Keywords:** Marine science, Socio-economic impacts, Biological parameters, Physico-chemical parameters, Pollution

Conservation and ecological management of Philippine Lakes in relation to fisheries and aquaculture, Volume No. Issue No. , 13-17 (Filipiniana Analytics) Fil(B) SH1 C74 2001

# The shallow water marine sponges (Porifera) of Cebu, Philippines Longakit, Ma. Belinda A., Sotto, Filipina B., Kelly, Michelle

Thirty-three (33) species of marine sponge were identified in this study. Four were identified as possibly new to science; a short description of these species is given here. In addition, one species has potential for bath sponge culture. Percent similarity of species is low between stations suggesting a highly diverse sponge assemblage around the island. Clustering of the stations appears to be related to distance between stations. (Author's abstract)

Keywords: Marine science, Sponges, Cebu, Percentage similarity, Number of species

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 17 Issue No. 2, 52-74 (Filipiniana Analytics) Fil(S) Q1.A3 S4 17/2 2005

0399

#### Stock assessment of commercially important fishes in Naujan Lake Pasumbal, Ramelo A., Perez, Cirila T.

Four major fish landing centers in the municipalities of Socorro, Pola, Victoria and Naujan were surveyed from May 1995 to December 1996. Eight types of fishing gear had been recorded. The most commonly used was gill net or 'pante', followed by fish pot 'bubo', fish corral 'baklad', spear 'salapang', spear gun 'pana', fish trap 'patanga', encircling net 'takilis' and long line 'kitay'.

Tilapia comprised 61 % of the total fish production of the lake, followed by therapon (16%), goby (4%) and

mudfish (2%). The other species caught were 'pIa salid', catfish, mullet, carp, milkfish and shrimp, which contributed 17% to the total production. Migratory fishes like the mullet and milkfish, on the other hand, showed a declining trend in production. (Author's abstract)

**Keywords:** Long line (kitay), Marine science, Gill net (pante), Fish pot (bubo), Fish corral (baklad), Spear (salapang), Spear gun (pana), Fish trap (patanga), Encircling net (takilis)

Conservation and ecological management of Philippine Lakes in relation to fisheries and aquaculture, Volume No. Issue No. , 99-107 (Filipiniana Analytics) Fil(B) SH1 C74 2001

#### 0400

# A survey of macro-invertebrate gleaning in the Banate Bay Intertidal Area, Eastern Panay Island

### del Norte-Campos, Annabelle G.C., Campos, Wilfredo L., Villarta, Karen A.

The gleaning fishery on the intertidal areas of Banate Bay, eastern Panay was surveyed monthly from February 2002 to January 2003, to derive information on species composition, catch, catch rates, and annual value. Total biomass, gleaning and turnover rates were determined from a fishery-independent survey conducted in June 2005. Catches of the fishery consisted of a total of 17 species, comprised of mollusks, crustaceans and a brachiopod. The bivalves *Kalelysia hianlina, Scapharca inaequivalvis,* and *Gafrarium tumidum* were the top three species, together comprising 88.79 % of the total catch. The total mean daily catch per gleaner for all species was equivalent to 73.75 g/m<sup>-2</sup>/gleaner<sup>-1</sup>. Catch rate and catch volume for the mollusks were highest between May-July and November-December, coinciding with the southwest and northeast monsoons, respectively. The large riverine inputs to the area, together with the mangrove-derived organic matter, periodically resuspended by the tidal fluctuations, are seen as responsible for increasing organic matter content of the substrates and abundance of the species. Total annual catch of the fishery is estimated to range from 20,988.7 to 43,527.62 kg, with a median value of 31,205.6 kg. This latter value divided by the estimated total biomass in the area of 2,441.03 kg gives a turnover rate of 12.8. The total annual catch for the entire fishery is equivalent to a total value of PhP 421 T to  $897T/yr^{-1}$ . The latter correspond to an annual income ofPhP 14,043.90 to  $29,904.67/gleaner<sup>-1</sup>/yr^{-1}$ , small amounts which may be sustainable due to the high turnover rate of the system. (**Author's abstract**)

Keywords: Marine science, Gleaning, Benthos, Species composition, Catch, Catch rates, Biomass, Turnover rate

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 17 Issue No. 2, 11-20 (Filipiniana Analytics) Fil(S) Q1.A3 S4 17/2 2005

0401

# Sustainable development of Philippine Lake Resources: an agenda for research and development *Guerrero, III, Raphael D.*

There are 59-70 lakes in the Philippines. With the exception of Laguna de Bay and Lake Taal. little is known about Philippine lakes although they contribute as much as 15% to the total annual fisheries production of the

country. There is need for an integrated basin approach for the sustainable management of Philippine lake resources. Among the research strategies recommended for sustainable management of Philippine lakes are: (1) studies on lake fisheries resources - fish stock assessment. effects of fishing and other human activities on lake productivity. the biology of major aquatic species, and the carrying capacity of lakes; and (2) lake management studies - the rational use of lakes. strengthening management. enforcement and institutional mechanisms. and socio-economics focused on the users of lakes. (Author's abstract)

Keywords: Marine science, Lake management, Fisheries resources, Carrying capacities, Fish stock assessment

Conservation and ecological management of Philippine Lakes in relation to fisheries and aquaculture, Volume No. Issue No., 19-23 (Filipiniana Analytics) Fil(B) SH1 C74 2001

0402

# Technological improvements in commercial *Eucheuma* cultivation: a short communication *Ask, Erick, Azanza, Rhodora, Simbik, Made, Cay-an, Recarte, Lagahid, Jose*

Two new devices developed by FMC BioPolymer for attaching propagules of the commercial *Eucheumas Kappaphycus alvarezii* and *Eucheuma denticulatum* to farm lines (the Eclip and Made Loop) were tested against the conventional Tie-tie system based on growth rate, percent plant loss, seeding and stripping time, as well as cost. Compared to the Tie-tie system, growth rates and percent plant loss were not statistically different with the Eclip and Made Loop. Seeding time is four times faster with the Made Loop and twice as fast with the Eclip. Stripping the line took a similar amount of time with the Eclip, but is 30 times faster with the Made Loop. The material cost of the Made Loop is similar to Tie-tie, although the Eclip is over ten times more costly. The cost of the Tie-tie did not include the fact that the Made Loop will last two years while the Tie-tie lasts no more than three months and, subsequently labor must be expended at least eight times as often to replace them on the main farm line. (Author's abstract)

**Keywords:** Eucheuma Kappaphycus, Marine science, Farming systems, Tie-tie method, Seeding technique, Seaweeds, Carrageenan

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 2, 47-51 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/2 2003

0403

# Wind stress curl and surface circulation in the South China Sea and the Philippine Sea *Amedo, Charina Lyn A., Villanoy, Cesar L.*

Wind stress curl is believed to be the main driving force for the circulation in the South China Sea. However, there has been no attempt to relate wind stress curl with surface currents. In this study, the variability of wind stress curl and stnface currents were characterized using time-domain empirical orthogonal functions (EOF). The data used were the monthly average wind stress curl obtained from UWM COADS monthly time series for 1980-1989 and Richardson's ship-drift derived surface currents. Surface current EOF analysis yields three dominant modes, which account for 50%, 13%, and 7% of the total variance. Mode I is dominated by the western boundary current system in the Pacific with no significant temporal variations. Mode 2 reflects reversal of the South China Sea western

boundary flow and variations in Mindanao eddy associated with the reversing monsoons. Mode 3 magnitudes were maximum during the monsoon transition periods and were dominated by the circulation in the Celebes Sea. For the wind stress curl, the first two EOF modes explained 40% and 32% of the total variance, respectively. Mode 1 is dominated by the positive wind stress curl throughout the South China Sea during the northeast monsoon. Mode 2 is associated with wind stress curl distribution during the southwest monsoon. The seasonal variability of surface currents in the South China Sea was highlighted by the seasonal reversal of the western boundary currents consistent with the reversal of the wind stress curl in the southern part of the South China Sea. In the interior, the surface currents were mostly associated with Ekman drift, except in the central part where an eastward extension of the western boundary current was observed during the southwest monsoon. (Author's abstract)

Keywords: Marine science, Empirical orthogonal function, Wind stress curl, South China Sea, Surface currents

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 2, 32-40 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/2 2003

### Women in the December 26 tsunami: how have they coped; how can we help? *Choo, Poh-Sze*

The tsunami that occurred on December 26, 2004 brought tremendous suffering and loss of life to several countries in the Indian Ocean. No less than 290 000 lives were lost in the countries affected, many of them from fishing communities. The re were more women victims than men, and there were reports of women and children being disadvantaged and victimized. This paper describes how women were affected by the tsunami. It also highlights the importance of gender-sensitive emergency and reconstruction plans to ensure that the needs of women, men, girls and boys are given equal attention and treatment during a disaster. (Author's abstract)

Keywords: Marine science, Tsunami, Social status, Cultural status, Economic status

NAGA, WorldFish Center Quarterly, Volume No. 28 Issue No. 1-2, 13-16 (Filipiniana Analytics) Fil(S) SH1 I81 28/1-2 2005

## MATHEMATICS

0405

# On a lesile-type predator-prey model with diffusions Hsu, Sze-Bi, Du, Yihong

This paper, we first study the asymptotic behavior of the diffusive Lesile-Type predator-prey model in a homogeneous environment. Then we introduce spatial heterogeneity and show that the positive steady state solutions exists by topological degree argument. (Author's abstract)

Keywords: Lesile-type predator-prey model, Mathematics, Heterogeneity, Topological degree

Matimyas Matematika: official journal of the mathematical society of the Philippines, Volume No. 26 Issue No. 1-3, 56-64 (Filipiniana Analytics) Fil(S) QA1 M42 26/1-3 2003

# Some characterizations of the direct product of gassmann triples Perez, Keneth P., Vilela, Jocelyn P.

In a finite group G, two subgroups  $H_1$  and  $H_2$  are Gassmann equivalent if each conjugacy class of G intersects  $H_1$  and  $H_2$  in the same number of elements. The triple (G,  $H_1$ ,  $H_2$ ) is then called a Gassmann triple. This definition id equivalent to the well-known Sheng Chen's criterion for Gassmann equivalence. This paper considers this said criterion and a result on transitivity of Gassmann triples as tools in investigating some of the properties a Gassmann triple may satisfy with respect to direct product of Gassmann equivalent subgroups.

If  $(G, H_1, H_2)$  is a Gassmann triple, then Sheng Chen's Criterion guarantees the existence of a bijective functions  $\varphi: H_1 \rightarrow H_2$  such that  $\varphi(h)$  is in the conjugacy class of h for all elements h of  $H_1$ . It also shows that  $(G, H_2, H_1)$  is a Gassmann triple. With example of a Gassmann triple in hand, one asks whether the group in consideration contains another Gassmann triple and that the transition of these triples also form a Gassmann triple.

		Results							of				this			pape			
	1.	If	(G,	H,	K)	and	(G,	Η,	L)	) are	Gassn	nann	triples,	then	(G,	Κ,	L)	is	also a
				Gassmann										triple.					
	2.	If	(G,	H,	K)	is a	Gas	sman	n	triple,	then	(GxG	, HxH,	KxK	() is	a (	Gassi	nann	triple.
	3.	If	(G,	H,	K)	and	(G,	Η,	L	) are	Gassr	nann	triples,	then	(G,	Hxl	Κ,	HxL)	is a
	Gassmann													triple.					
	4.	If	(G,	Н,	K)	and	G,	H,	L)	are	Gassma	nn t	riples,	then	(GxG,	Hx	H,	KxL)	is a
	Gassmann triple													triple.					
The		last	resu	ılt	is	exte	ended	. i	nto	a	finit	e 1	number	of	fac	tors	as	s 1	follows:
	5.	. I	Let	(G,	Н,	$K_1$	, ((	G,	H,	K <sub>2</sub> ),		, (	G, H,	$\mathbf{K}_{n}$ )	be	Ga	ssma	nn	triples.
Then ( $\Pi$ G, H, $\Pi$ K <sub>i</sub> ) is a Gassmann triple. (Author's abstract)																			

**Keywords:** Mathematics, Conjugate subgroups, Conjugacy class, Sheng chen's criterion, Gassmann triple, Gassmann equivalent subgroups, Direct product of subgroups

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 169 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0407

#### On construction of a quasi-regular self-complementary graph Arugay, Esperanza Blancaflor

A quasi-regular self-complementary graph is a graph of order 4k, k a positive integer, where 2k vertices have degree 2k and the remaining 2k vertices have degree 2k-1. This paper presents a procedure for construction a quasi-regular self-complementary graph and formulate its computer program algorithem. (Author's abstract)

Keywords: Mathematics, Quasi-regular self-complementary graph, Integer, Vertices, Complementing permutation

NRCP Research Journal, Volume No. Issue No., 11-22 (Filipiniana Analytics) Fil(S) Q179.9 N323 v.5 1998

#### A convergence theorem without pointwise covergence *Cabral, Emmanuel A.*

In [5] and also in [6] there is a proof of a convergence theorem without the condition of pointwise convergence of the integrands  $f_n$ . We want to ask whether a similar convergence theorem can be formulated in  $\mathbf{R}^m$ . This paper provides an answer to this question. We will give a convergence theorem in the space of primitives (indefinite integrals) that naturally results in the convergence of the corresponding integrands. (Author's abstract)

Keywords: Mathematics, Convergence theorem, Pointwise covergence, Indefinite integrals

Matimyas Matematika: official journal of the mathematical society of the Philippines, Volume No. 26 Issue No. 1-3, 18-27 (Filipiniana Analytics) Fil(S) QA1 M42 26/1-3 2003

0409

#### Convex domination in the composition and cartesian product of graphs Labendia, Mhelmar A., Canoy, Jr., Sergio R.

The convex dominating sets in the composition and cartesian product of two connected graphs were characterized. It was shown that the convex domination number  $\gamma_{con}$  (G[H]) of a composition G[H] of two non-complete connected graphs G and H is equal to the clique domination number  $\gamma_{cl}(G)$  of G. The convex domination number

 $\gamma_{con}$  (G x H) of the cartesian product of two connected graphs was also studied. It was found out that this number is related to the convex domination numbers of the graphs involved.

Some results in an earlier work on convexity were used to characterize the convex dominating sets in the composition and cartesian product of two connected graphs. The concept of cyclic domination number was also defined as this was needed to obtain an expression for the convex domination number of a composition of graphs.

The following results this study: were generated in 1. Let G be a connected graph and  $K_n$  the complete graph of order n. A subset  $C = U \{ \{x\} \mid x \mid T_x \}: x \in S \}$  of  $V(G[K_n])$  is convex dominating in  $G[K_n]$  if and only if the S is convex dominating in G. 2. Let G be a connected graph and  $K_n$  the complete graph of order  $n \ge 1$ . Then  $\gamma_{con}$   $(G[K_n]) = \gamma_{con}(G)$ . 3. Let G and H be connected non-complete graphs with  $\gamma_{cl}(G) \ge 2$ . Then a subset  $C = U \{\{x\} \mid x \mid T_x\}: x \in S\}$  of V(G[H]) is convex dominating in G[H] if and only if the S is a clique dominating set in G and  $T_x$  is a clique in H for every E Х 4. Let G and H be connected non-complete graphs with  $\gamma_{d}(G) > 2$ . Then  $\gamma_{con}$  (G[H]) =  $\gamma_{d}(G)$ . 5. Let G and H be connected graphs of orders m and n, respectively. Then  $\gamma_{con}$  (G x H) = min {n  $\gamma_{con}$ (G), m  $\gamma_{con}(H)$  (Author's abstract)

Keywords: Mathematics, Domination, Convex, Clique, Composition, Cartesian product

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 165 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

### 0410

#### Cubic construction over binary cyclic codes Natividad-Pasion, Ann Marie

The construction of binary quasi-cyclic codes of length lm and index l given by Ling and Solé in [4] is used to explore the possibility of cyclic codes. In particular, we consider the cubic construction m = 3. By taking the two constituent codes, say  $C_1$  and  $C_2$ , of this construction to be cyclic of length l over GF(2) and  $GF(2^2)$  respectively, we obtain a code C of length 3l which is also cyclic. Then, we characterize the nonzeros of the resulting code C as a function of the nonzeros of the constituent codes  $C_1$  and  $C_2$ . We achieve this by using the Mattson-Solomon polynomial associated to a codeword to obtain a trace representation. This representation will then be applied to the cubic construction of l-quasi-cyclic codes to produce the desired cyclic code. Similar results can be achieved for the quintic (m = 5) and the septic (m = 7) constructions over GF(2). (Author's abstract)

Keywords: Mathematics, Binary cyclic codes, Cubic construction, Quasi-cyclic codes, Polynomial

Matimyas Matematika: official journal of the mathematical society of the Philippines, Volume No. 26 Issue No. 1-3, 90-95 (Filipiniana Analytics) Fil(S) QA1 M42 26/1-3 2003

#### 0411

#### The daugavet equation for a sequence of operators Shaw, Sen-Yen, Wong, Han-Jin

We extend the well-known Daugavet equation from a single operator to a sequence of operators. Also proved is a related theorem about the existence of a common complete vector for the sequence. (Author's abstract)

Keywords: Mathematics, Daugavet equation, Common complete vector, Banach, Burkinshaw

Matimyas Matematika: official journal of the mathematical society of the Philippines, Volume No. 26 Issue No. 1-3, 109-116 (Filipiniana Analytics) Fil(S) QA1 M42 26/1-3 2003

## Decompositions involving quaternion matrices and complex partitioned matrices Viloria, Jimmy V., Merino, Dennis I.

Quaternion matrices can be studied via complex matrices since the ring of *n*-by-*n* quaternion matrices is isomorphic to a subring of  $M_{2n}$  (C) whose elements are called complex partitioned matrices. The companion operator is studied and used to construct unitary complex partitioned matrices. Decompositions of various classes of complex partitioned matrices via unitary complex partitioned matrices are considered: normal, unitary, Hermitian, skew-Hermitian, real symmetric, and commuting normal complex partitioned matrices. (Author's abstract)

Keywords: Mathematics, Quaternion matrices, Complex partitioned matrices, Hermitian, Unitary, Skew-hermitian

Matimyas Matematika: official journal of the mathematical society of the Philippines, Volume No. 26 Issue No. 1-3, 127-136 (Filipiniana Analytics) Fil(S) QA1 M42 26/1-3 2003

0413

# Deformation quantization and quantum moment maps *Nable, Job A.*

This paper presents the various quantized or quantum objects, in the setting of deformation quantization, corresponding to classical differential geometric objects, for instance, functions, tangent bundles, differential forms, Lie derivatives, and moment maps. Such correspondence in deformation quantization became clear only after B. Fedosov's beautiful solution of the problem of deformation of arbitrary symplectic manifolds. K. Hamachi recently obtained a new invariant of star-products which is intimately connected to quantum moment maps. This invariant is quite difficult to compute in concrete examples and this paper adds to the examples given by Hamachi. (Author's abstract)

Keywords: Mathematics, Deformation, Quatization, Quantum moment maps

Matimyas Matematika: official journal of the mathematical society of the Philippines, Volume No. 26 Issue No. 1-3, 80-89 (Filipiniana Analytics) Fil(S) QA1 M42 26/1-3 2003

0414

### Determining optimal inventory levels of multiple repairable items Mabini, Marilyn C.

This paper presents a deterministic model for finding the purchase order and repair batch quantities which will minimize the total cost of managing a repairable inventory system consisting of multiple items. The model allows backorders and considers storage capacity limitation. Fixed and known scrapping rates are assumed for the items. (Author's abstract)

Keywords: Mathematics, Repairable inventories, Purchase order, Repair induction

Acta Manilana, Volume No. Issue No. , 27-34 (Filipiniana Analytics) Fil(S) Q181 A81 v.60 2012

## Forecasting dengue incidence in the National Capital Region, Philippines: using time series analysis with climate variables as predictors

dela Cruz, Arjelou C., Lubrica, Jonathan A., Punzalan, Bill Vincent D.C., Martin, Mary C.

The Philippines, like many of the developing countries, is among the most vulnerable to the impacts of climate change. As changes in rainfall patterns exacerbate the incidence of vector-borne diseases such as dengue, the country is in need of efficient tools to provide for better dengue prevention and control programs. The National Capital Region (NCR) consistently belongs to the regions with the highest number of dengue cases per year. This study provides a Seasonal Auto-Regressive Integrated Moving Average (SARIMA) model that could predict dengue outbreaks based on the past dengue incidences and climate variables in NCR Monthly dengue incidence data from January 2005 to December 2010 were fitted into a SARIMA model (RMSE = 0.3365). All the climatic variables showed positive correlation with the number of dengue cases. The predictive power of the SARIMA model was enhanced by the inclusion of climatic variables as external regressors to forecast the year 2011. (Author's abstract)

Keywords: Mathematics, Dengue incidence, Climate variables, Predictors

Acta Manilana, Volume No. Issue No., 19-26 (Filipiniana Analytics) Fil(S) Q181 A81 v.60 2012

0416

### Fractional calculus and their applications Tu, Shih-Tong, Wang, Pin-Yu

Fractional calculus (that is integrals and derivatives of any arbitrary real or complex order) has gained importance and popularity during the past three decades, since it has provided several useful tools for solving differential and some types of partial differential equations and various other problems involving special functions of mathematical physics as well as their extensions and generalizations in one and more variables. The main object of this paper is to present a brief introduction to the theory of fractional calculus and give a survey of applications in the derivation of particular solutions of a number of familiar second-order (or higher) differential equations. We will also give their applications associated with logarithmic and infinite sums. We will also give the most recent contributions on this subject, involving some equalities derived from the N-fractional calculus of a product log(z - c) . (z - c) and their generalizations. (Author's abstract)

Keywords: Mathematics, Fractional calculus, Integrals, Derivatives, Differential equation

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0417

Incompressible limit of the compressible euler-poisson system for general initial data Lin, Chi-Kun, Li, Hailiang, Masmoudi, Nader We consider the asymptotic limit of the nonisentropic compressible Euler-Poisson system for semiconductors for small Debye length  $\lambda$  in the quasineutral regime. We prove that for small Debye length, the momentum of the nonisentropic compressible Euler-Poisson system can be approximated by the solution of incompressible Euler equation plus the oscillating term which is not the usual acoustic wave but a singular Kelin-Gordon equation due to the electrostatic potential. To this end, we first construct the classical solution of the compressible Euler-Poisson system near the incompressible Euler equations combined with the leading order fast oscillating term by asymptotic expansion

for fixed but small Debye length  $\lambda > 0$  for general (ill-prepared) initial data in H<sup>S</sup>,  $s \ge 1 + N/2$ . This in turn gives the convergence of the current of Euler-Poisson system to the solution of the incompressible Euler equation plus fast oscillation term, and the projection of the current density onto the space of divergence free vector fields converges to the solution of the incompressible Euler equation strongly. (Author's abstract)

Keywords: Mathematics, Euler-poisson system, Debye length, Kelin-Gordon equation

Matimyas Matematika: official journal of the mathematical society of the Philippines, Volume No. 26 Issue No. 1-3, 71-79 (Filipiniana Analytics) Fil(S) QA1 M42 26/1-3 2003

#### The minimal closed geodetic numbers of graphs Aniversario, Imelda S., Jamil, Ferdinand P.

Given two vertices u and v of a connected graph G, the closed interval  $I_G[u, v]$  is the set of all vertices lying in some u-v geodesic in G. If S  $\dagger$ " V(G), then  $I_G[S] = *" \{ I_G [u, v " S \} \}$ . A set S of vertices in G is called a geodetic cover of G if  $I_G[S] = V(G)$ . The geodetic number gn(G) of G is the minimum cardinality of a geodetic cover of G. A geodetic cover of smallest cardinality is called a geodetic basis of G. Suppose that in constructing a geodetic cover of G, we select a vertex  $v_1$  and let  $S_1 = \{v_1\}$ . Select a vertex  $v_2$  " $v_1$  and let  $S_2 = \{v_1, v_2\}$ . Then successively select vertex  $v_i$ "  $I_G[S_{l-1}]$  and let  $S_i = \{v_1, v_2, ..., v_i\}$ . The closed geodetic number cgn(G) and the upper closed geodetic number ucgn(G) of G is the smallest and the largest k, respectively, for which selection of  $v_k$  in the given manner makes  $I_G[S_k] = V(G)$ . A closed geodetic cover S of G is a minimal closed geodetic cover of G if no proper subset of S is a closed geodetic cover of G. The minimal closed geodetic number mcgn(G) is the maximum cardinality of a minimal closed geodetic cover of G. In this paper, it is shown that ucgn(G) = mcgn(G) if and only if G is complete, while cgn(G) and mcgn(G) coincide among extreme geodesic graphs G. Moreover, for complete bipartite graphs  $K_{m,n}$ ,  $cgn(K_{m,n}) = mcgn(K_{m,n})$  if and only if m = n. More interestingly, for every triple  $a, b, cgn(K_{m,n}) = mcgn(K_{m,n})$  $c " Z^{\dagger}$ , with 2 d" a < b < c, a, b, and c, are realizable as closed geodetic number, minimal closed geodetic number, and upper closed geodetic number, respectively, of a connected graph. We also determined here the minimal closed geodetic numbers of graphs resulting from the join of graphs. (Author's abstract)

Keywords: Mathematics, Geodetic number, Bipartite graph, Geodetic cover

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 170 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011 A graph is said to be singular if its adjacency matrix is singular; otherwise, it is said to be nonsingular.

It is easy to see that among the regular graphs, there are infinitely many which are singular and infinitely many which are nonsingular. For a fixed r, we show that there exists a connected r-regular singular graph of arbitrarily large order. Likewise, there exists a connected r-regular nonsingular graph of arbitrarily large order. (Author's abstract)

Keywords: Singular graph, Mathematics, Nonsingular graph, Matrix

NRCP Research Journal, Volume No. Issue No., 37-44 (Filipiniana Analytics) Fil(S) Q179.9 N323 v.5 1998

0420

#### Secure domination in a network: a protection strategy Canoy, Jr., Sergio R., Go, Carmelito E.

The concept of secure total domination in graphs was investigated further. The study particularly considered a result obtained by Benecke et al. in a recent article. A counter example showed that such result is faulty. A rectification of this result was provided and some quick consequences of the same were stated. Secure total dominating sets in the join of graphs were also studied and some characterizations were generated.

The aforementioned new type of protection strategy in a given network was considered in this study. This strategy which uses a variant of domination in a network is more secure than the ones studied previously. Just like other existing strategies, the objective in this strategy is to evaluate or determine the minimum number of guards needed to protect a graph or network.

The following main results have been generated in this study:

1. Let X be a total dominating set in a connected graph G,  $v \in X$ , and  $u \in V(G) \setminus X$ . Then v X-depends u if and contained only if epn(v;X) and ipn(v;X) are in NG (u). 2. e epn(v;X) for some E then -defended. If 11 X, n is not 3. Let X be a total dominating set in G. Then X is a secure total dominating set if and only if (i)  $epn(v;X) = \phi$  for all  $v \in X$ , and (ii) for each  $u \in V(G) \setminus X$ , there exists  $v \in X \setminus N(u)$  such that  $ipn(v;X) \subseteq N(u)$ . 4. Let G be a connected graph of order n > 2. Then st(G) = 2 if and only if there exist x,  $y \in V(G)$  such that  $xy \in V(G)$ E(G) and N(x)and V(g) = V (G) //  $\{\mathbf{X}\}$ N(y)= // {v}. 5. Let G and H be connected non-complete graphs of orders m and n, respectively. Then  $\gamma_{st}(G+H) = 2$  if and only if at least one of the following holds: (i)  $\gamma_{st}(G) = 2$  or (ii)  $\gamma_{st}(H) = 2$ , or (iii)  $\hat{a}^{\dagger}(G) = m - 1$  and  $\hat{a}^{\dagger}(H) = n - 1$ . 6. Let G and H be connected non-complete graphs of orders m and n, respectively, and suppose  $st(G+H) \neq 2$ . Then st(G+H) = 3 if and only if at least one of the following holds: (i)  $\gamma(G) = 2$ , or (ii)  $\gamma(H) = 2$ , or (iii)  $\hat{a}^{\dagger}(G) = m - 1$  1 or  $\hat{a}^{\dagger}(H) = n - 1$  (but not both). (Author's abstract)

Keywords: Mathematics, X-defended, Secure, Domination, Total domination, Join

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 164 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

#### A study of singular bipartite graphs Gervacio, Severino V.

Singular graphs are those graphs with singular adjacency matrix. The problem of characterizing singular graphs is one open problem in Graph Theory which seems to be very difficult. Thus, we focus our attention here to bipartite graphs only. In some instances, we consider special classes of bipartite graphs such as the planar grids, and some which special classes of graphs contain some bipartite graphs such as the prisms.

To facilitate the computation of determinants, special graph reduction formulas are developed. By means of some graph reduction formulas, it is shown that the planar grid  $P_m x P_n$  is singular if and only if m + 1 and n + 1 are not relatively prime. Another technique was found to apply not only to planar grids but also to prisms and toroidal grids. Thus, the characterization problem is completely solved in these special classes of graphs. (Author's abstract)

Keywords: Mathematics, Graph, Graph theory, Bipartite graphs, Singular graph

NRCP Research Journal, Volume No. 1 Issue No. 1, 5-16 (Filipiniana Analytics) Fil(S) Q179.9 N323 1/1 1992

0422

## On sufficient condition for the existence of imaginary roots of a cubic polynomial equation Yambao, Enrico M., Decena, Ma. Carlota B.

The exact condition on the parameters *a*, *b*, *c*, *d*, **E R** sufficient to show the existence of imaginary roots of a cubic polynomial equation  $ax^3 + bx^2 + cx + d = 0$ ,  $\alpha \neq 0$  are presented. (Author's abstract)

Keywords: Mathematics, Cubic polynomial equation, Imaginary roots, Parameters

Acta Manilana, Volume No. Issue No. , 15-18 (Filipiniana Analytics) Fil(S) Q181 A81 v.60 2012

0423

## Symmetric designs from a rahilly family of pre-difference sets of orders 2 and 3 Alejandro, Priscila P.

Half-regular symmetric designs with no regular group of automorphisms were constructed using pre-difference sets of order 2 in [4]. Another class of designs is derived from a Rahilly family of pre-difference sets of order 3. These designs are non-isomorphic to the existing 2-regular designs because they differ in the number of points. (Author's abstract)

Keywords: Mathematics, Automorphisms, Symmetric designs, Non-isomorphic

Matimyas Matematika: official journal of the mathematical society of the Philippines, Volume No. 26 Issue No. 1-3, 1-4 (Filipiniana Analytics) Fil(S) QA1 M42 26/1-3 2003

# Symmetry reductions and a posteriori finite element error estimators for bifurcation problems *Chien, C.S., Jeng, B.W.*

We discuss numerical methods for solving nonlinear eigenvalue problems. First, we exploit the idea of symmetry reductions and discretize the problem on a symmetry cell by the finite element method. Then we incorporate the multigrid V-cycle scheme in the context of continuation method to trace solution branches of the discrete problems, where the preconditioned Lanczos method is used as the relaxation scheme. We study how the a posteriori estimates of the discretization error are affected by symmetry reductions. Finally, we report some numerical results which show the algorithms we propose are efficient and robust, and can be easily implemented. (Author's abstract)

Keywords: Mathematics, Nonlinear eigenvalue, Symmetry reductions, V-cycle

Matimyas Matematika: official journal of the mathematical society of the Philippines, Volume No. 26 Issue No. 1-3, 37-46 (Filipiniana Analytics) Fil(S) QA1 M42 26/1-3 2003

### 0425

# On the dynamics of resource-consumer-toxicant systems II: stress effects on reproduction and their implications on the survival of a population *De Luna, Jose T.*

In order to gain insights into the relationships between individual and population dynamics, mathematical models that relate the organism's size, reproductive effort, and resulting offspring to the population biomass were developed. These models were based on life history theory and on the bioenergetics of a reproducing organism. In formulating the dynamics of the size of the organism, the possibility that reproduction may take place at the expense of future survival and reproductive performance of the parent organism (somatic cost) was taken into account. Moreover, the life span of the individual members was expressed in terms of senescence toxic chemical has entered the system. Modifications were incorporated to account for stress and for some physiological changes in the exposed organism. The ideas in the general models were illustrated using *Daphnia* exposed to cadmium.

The models showed that only the number of offspring that survived to maturity directly affected the dynamics of the population while the size and reproductive effort of an individual organism were important in determining the stability of the population. The models further showed that while individual organism models were important in determining the structure and subsequently, the dynamics of a population, extreme care must be exercised in obtaining population level information from individual organism models. (Author's abstract)

Keywords: Mathematics, Individual dynamics, Population dynamics, Daphnia, Cadmium

NRCP Research Journal, Volume No. 1 Issue No. 1, 17-49 (Filipiniana Analytics) Fil(S) Q179.9 N323 1/1 1992

# On the hausdorff dimension of sierpinski carpets *Carpio, Harry M.*

It is well-known that the Hausdorff dimension of a class of fractals in Rn determined by N contracting similitudes that contract by a factor r is ( $\log N / \log r$ ). We extend this formula to include a class of Sierpinski carpets determined by N contracting affine maps on R". Our results is closely related to a result of McMullen, which was obtained using probabilistic methods. (Author's abstract)

Keywords: Mathematics, Fractal, Hausdorff dimension, Sierpinski carpets, Affine transformation

NRCP Research Journal, Volume No. Issue No., 23-36 (Filipiniana Analytics) Fil(S) Q179.9 N323 v.5 1998

0427

### On the number of distinct self-dual codes over Z<sub>9</sub> Balmaceda, Jose Maria P., Betty, Rowena Alma L., Nemenzo, Fidel R.

We give a mass formula which counts the number of distinct self-dual codes over the ring  $Z_9$ . (Author's abstract)

Keywords: Mathematics, Distinct self-dual codes, Z9, Coding theory

Matimyas Matematika: official journal of the mathematical society of the Philippines, Volume No. 26 Issue No. 1-3, 9-17 (Filipiniana Analytics) Fil(S) QA1 M42 26/1-3 2003

0428

#### On the radiality assumption for existence and blowing up Arceo, Carlene P., Sy, Polly W., Otani, Mitsuharu

This paper studies further the conditions for existence and blowing up of solutions to the parabolic equation

 $u_t = \hat{a}^{\dagger} u_p + |u|^{p-2} u (1 - |x|)^{-\alpha}$ 

with Dirichlet boundary condition  $uI_{\partial B}$  and  $\alpha > 0$ . In particular, the assumption of radiality on the initial estimate is investigated. Using mainly approximation with standard comparison and convergence arguments, it is shown that

the equation is still solvable even with a nonradial initial estimate, provided it is bounded by a radial initial estimate. (Author's abstract)

Keywords: Mathematics, Blowing up, Radiality, Parabolic equation

Matimyas Matematika: official journal of the mathematical society of the Philippines, Volume No. 26 Issue No. 1-3, 5-8 (Filipiniana Analytics) Fil(S) QA1 M42 26/1-3 2003

#### 0429

#### On the unique solvability of a volevic system of singular partial differential equations Escaner, IV, Jose Maria L., Arceo, Carlene P., Lope, Jose Ernie C.

We establish existence and uniqueness theorems for a Volevic system of singular partial differential equations. Our results are generalizations of those obtained by Baouendi-Goulaouic [1], Elschner [2], Tahara [6] and Lope [4] for singular equations. (Author's abstract)

Keywords: Mathematics, Volevic system, Singular partial differential equations, Tahara [6]

Matimyas Matematika: official journal of the mathematical society of the Philippines, Volume No. 26 Issue No. 1-3, 47-55 (Filipiniana Analytics) Fil(S) QA1 M42 26/1-3 2003

0430

## **On triangle graphs** *Dorado, Crisanto A., Ramos, Rolando E.*

The triangle graph T(G) of a graph G with triangles is the graph whose vertices are the triangles of G in which two vertices are joined if and only if they have a common edge in G. A graph H is a triangle graph if there exists a graph G with triangles such that  $T(G) \approx H$ . This paper solves  $T(G + E_n) \approx L(G) \ge K_n$ , describes the triangle graph of maximal planar graphs, characterizes triangle forests, and characterizes triangle cacti. Suggestion are given to solve  $T(G) \approx G$  and characterize  $T(K_n)$ . (Author's abstract)

Keywords: Mathematics, Triangle, Graph, Planar graph, Triangle cacti

NRCP Research Journal, Volume No. 1 Issue No. 1, 1-4 (Filipiniana Analytics) Fil(S) Q179.9 N323 1/1 1992

> Unit graphs: dimension and span Gervacio, Severino V., Raposa, Blessilda P.

0431

A graph G is usually represented pictorially in the plane (Euclidean 2-space  $E_2$ ) by associating vertices with distinct points and joining two points by a line segment (of any shape) whenever they correspond to adjacent vertices. Thus, the appearance of the pictorial representation depends on the way the points are chosen and the shapes of the line segments joining adjacent vertices. Normally, the euclidean distance between adjacent vertices is not considered when drawing a pictorial representation of a graph. In this paper, we study a special class of graphs whose pictorial representations can be drawn such that adjacent vertices are one unit apart with respect to euclidean distance. Such graphs are called unit graphs. The dimension of a graph G, denoted by dim G, is the smallest nonnegative integer n for which the vertices of the graph can be represented by points in the Euclidean n-space  $E_n$ such that the distance between adjacent edges is a equal to one. This paper gives bounds for the dim G as well as the dim sum G dim G. +where G is the complement of G. The problem of inscribing a graph in a sphere in  $E_n$  with as small a radius as possible is also studied here. (Author's abstract)

**Keywords:** Mathematics, Euclidean space, Distance, Sphere, Vector space, Dimension, Graph, Planar graph, Chromatic number

NRCP Research Journal, Volume No. Issue No., 1-10 (Filipiniana Analytics) Fil(S) Q179.9 N323 v.5 1998

0432

# Vertex cover of some supergraphs of planar grid *Uy, Joselito A.*

Let *G* be the cartesian product of paths  $P_m = \alpha_1 \alpha_2 \dots \alpha_m$  and  $P_n = b_1 b_2 \dots b_n$ . Vertex  $(\alpha_i, b_j)$  of *G* is denoted by  $c_{ij}$ . Let *H* be the supergraph of *G* formed by adding the edges  $c_{uv}c_{st}$  if |u - s| = |v - t| = 1. Vertex set of *H* has a subset *U* such that all the edges of *H* are incident to some elements of *U*. Such subset is called a vertex cover of *H*. The vertex covering number of *H*, denoted by  $\alpha(H)$ , is the minimum cardinality of a vertex cover of *H*. Let *q* and *r* be the quotient and remainder, respectively, when *n* is divided by 2. If n = 1, then  $\alpha(H) = \frac{\#m}{2\#}$ . If n > 1 and r = 0, then  $\alpha(H) = \frac{\#3m}{2\#}$ . If n > 1 and r = 1, then  $\alpha(H) = \frac{\#3m}{2\#}$ . (Author's abstract)

Keywords: Mathematics, Planar grid, Cartesian product, Supergraph, Vertex cover, Vertex covering number

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 166 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

**MEDICINE** 

0433

#### Analysis of ecstasy in human urine by high performance liquid chromatography Monlinong, Jason Paul C., Portilla, Ma. Cristina B., Reyes, Gian Carlo P., Pascual, Cherrie B.

Ecstasy or n-methyl-3, 4-methylenedioxymethamphetamine (MDMA) is one of the most popular club drugs. This drug was invented to treat obesity but is currently placed under Schedule 1 of controlled substances. It is a psychoactive drug like methamphetamine or shabu.

Ecstasy in urine was analyzed using High Performance Liquid Chromatography (HPLC) with UV detection set at 254 nm. Chromatographic analysis was carried out with a Luna  $5\mu$  C18 reversed phase column and (87:5:5:3) water:methanol:acetonitrile:ammonium buffer as mobile phase at flow rate of 0.5 mL/min. Ephedrine was used as an internal standard. MDMA and ephedrine showed average retention times of ~2.5 min and ~2.8 min respectively. Analysis of 0.50 ppm MDMA had % coefficient of variation (% CV) of 0.57% for the retention time of MDMA and 6.6% for peak area. Inter-day analysis showed % CV of 2.2% for retention time and 3.68% for peak area. Linear response was obtained over the concentration range of 0.10 ppm– 1.00 ppm. The limit of detection (LOD) was 0.03 ppm.

Different concentrations of MDMA were spiked in certified drug-free urine and a linear response at the same concentration range after liquid-liquid extraction with ether was also obtained. Gradient elution using (87:5:5:3) water:methanol:acetonitrile:ammonium buffer as mobile phase A and 100% acetonitrile as mobile phase B was employed to improve separation of MDMA from ephedrine in urine matrix. Different spiked urine samples underwent the same extraction procedure with ether and recoveries ranged from 81 - 104%.

HPLC analysis of ecstasy could provide an alternative rapid method to detect this drug of abuse in human urine samples. (Author's abstract)

**Keywords:** Medicine, n-methyl-3,4-methylenedioxymethamphetamine (MDMA), Ecstasy, Urine, HPLC, Liquidliquid extraction

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 159 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0434

# An Assessment of the selenium status of iodine-deficient and non-iodine deficient Filipino children

Amarra, Ma. Sofia V., Bongga, Demetria C.

The aim of this study is to examine and compare blood selenium levels in iodine-deficient and non-iodine deficient children. Two groups of children were examined: one group with iodine deficiency (n = 31) and the other group with normal iodine status (n = 32). Blood was extracted by venipuncture from children aged 6-10 years attending first grade in Commonwealth Elementary School in Quezon City. Whole blood selenium was examined by electrothermal atomic absorption spectrophotometry (AAS). Iodine status was determined by goiter palpation and urinary iodine excretion. Mean selenium levels of deficient and non-deficient children were compared using T-test. Using a cut-off value of 60  $\mu$ g Se/L whole blood, the proportion of children with normal and deficient iodine status who fell below this cut-off was compared using chi-square test. Whole blood selenium values ranged from 17.6 to 133.6  $\mu$ g/L. There were no significant differences in mean selenium levels between children with normal and deficient iodine status. Children with normal iodine status had a mean blood selenium level of 55.87 ± 26.3  $\mu$ g/L while children with deficient iodine status had a mean level of 58.76 ± 26.4  $\mu$ g/L. Sixty percent of children had blood selenium levels below the arbitrary cut-off of 60  $\mu$ g/L with no significant difference between groups (p = 0.165), indicating that selenium deficiency is prevalent in this group of children regardless of iodine status. Since selenium deficiency limits the response to iodine supplementation, further investigation is needed to determine whether the same situation exists in children from other areas. (**Author's abstract**)

Keywords: Medicine, Selenium status, Iodine deficiency, Schoolchildren, Nutritional status

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 14 Issue No. 1, 1-7 (Filipiniana Analytics)

### The association of patient factors and adherence to prescribed medications among hypertensive patients *Opina, Louricha A.*

Hypertension is a worldwide concern with low adherence as a cause for uncontrolled hypertension. Medications, health care provider factors and patient characteristics affect adherence. **Objective:** This study aims to determine the association between different patient factors (sociodemographic and clinical profile and health belief) and adherence to prescribed medications among hypertensives. **Methods:** This cross-sectional study is composed of 187 hypertensive follow-up patients of the PGH-FMC from August to September 2006. Patients had at least one anti-hypertensive prescribed for at least a month. Interview was done using a standard data collection tool and hospital charts were reviewed. Adherence was assessed using the Brief Medication Questionnaire (BMQ). **Results:** Based on the BMQ, 65 percent of 187 subjects were adherent. The affiliation of the health care provider who diagnosed (OR 0.43) and the patient's perception on problems in recall (OR 1.65), refills (OR 2.8) and side-effects (OR 2.69) were found to be significantly associated with adherence (95% confidence interval). **Conclusion:** This study supported previous finding that perceived barriers as the most powerful predictor across studies and behavior. To improve adherence, physicians must be conscious of the affordability, availability, accessibility and tolerability of drugs. Screening for perceived barriers should be part of patient assessment. Once identified, strategies to address these should be included in the patient management. Identifying other health perceptions using qualitative methodologies is also recommended for a more comprehensive and reliable assessment. **(Author's abstract)** 

Keywords: Medicine, Hypertension, Lifestyle, Medication events monitoring system

The Filipino Family Physician, Volume No. 46 Issue No. 2, 63-72 (Filipiniana Analytics) Fil(S) R97.4 F2 46/2 2008

0436

#### Basic health services and population growth *Romualdez, Jr., Alberto*

The continued high rate of population growth in the Philippines has serious consequences for basic health service delivery in terms of cost and quality. The estimated 2,000,000 Filipino babies added to the population each year will require added resources for immunization, disease control, and hospital services at all levels. Given the fact that the highest fertility rates are among the poorest 40% of the population, it is expected that service demands will be greatest in government facilities that are even now struggling to maintain service quality while dealing with more clients.

Conversely, improvements in basic health services can potentially reduce population growth rate by its influence on fertility rates. Improved MCH is known to be associated with lower fertility as child survival improvements. More directly, an aggressive family planning program that makes available all modalities for fertility regulation and prevention of unplanned or unwanted pregnancies will help couples to attain desired reduced family sizes.

A population policy that advocates a two-child family to increase contraceptive prevalence, promotes appropriate family planning methods to achieve an ideal contraceptive method mix, and encourages private sector collaboration

can reduce total fertility rate to the replacement rate of 2.1. If this rate is achieved within four or five years, the Philippines can realistically hope to reduce population growth rate to manageable levels and even target zero population growth by the year 2025 or soon after. (Author's abstract)

Keywords: Medicine, Population growth, Basic health services, Fertility, MCH, Family planning methods

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 3 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

0437

# Chromatographic analysis of ketamine and norketamine in human plasma and urine samples

### Portilla, Ma. Cristina B., Monlinong, Jason Paul C., Sia, Bettina, Pascual, Cherrie B.

In recent years, the illegal use of ketamine in the Philippines has risen and this drug is now included in the list of dangerous drugs under the Comprehensive Dangerous Drugs Act of 2002. Ketamine is a fast acting anesthetic that is mostly administered by veterinarians as an animal sedative. It is also used by anesthesiologists for pediatric and elderly patients as surgical anesthesia. Complications from the use of ketamine include hallucinations and confused states which contributed to the abuse of this drug.

Chromatographic analysis of ketamine and norketamine, its metabolite, was carried out using high performance liquid chromatography (HPLC) with UV detection at 210 nm on a  $C_{18}$  column. The mobile phase used was 30% acetonitrile and 70% phosphate buffer (0.03M, pH 7.2). Flow rate was 0.5 ml/min and oven temperature was set at 37 °C. The retention times of ketamine and norketamine were found to be at ~5.6 min and ~11.3 mins respectively. Reproducible results were obtained with CV (%) of 7.33 % or less. Linear response was obtained over a concentration range of 25 to 500 ppb. LOD for ketamine is 3.6 ppb while LOQ is 4.04 ppb. While for norketamine, LOD and LOO values were 6.10 and 6.72 ppb respectively.

Ketamine and norketamine standards were spiked in blank urine samples or human plasma sample from volunteers with no ketamine use. Linear response was also obtained over the concentration range of 25 to 500 ppb. Liquid-liquid extraction was utilized for sample preparation. Average percent recovery of ketamine spiked in blank human urine was 85.0% while in spiked human plasma samples, it was 91.0%.

This HPLC method could be utilized for routine analysis of ketamine and norketamine in human urine or plasma samples. (Author's abstract)

Keywords: Medicine, High performance liquid chromatography, Ketamine, Norketamine, Human plasma, Human urine

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 160 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011 **Background:** Chron ic urticaria is a skin disorder that .is a dilemma for both dermatologists and allergists alike because 50% of its causation is unknown and treatment remains to be symptomatic. The success of diagnosis and treatment of any chronic diseases which chronic urticaria is included is measured and relies on the identification of the etiologic cause and the unraveling of its patho-physiologic mechanism(s). At the present time this is not always possible.

**Objective:** To review the recent relevant articles on chronic urticaria, more specifically Chronic Idiopathic Urticaria (CIU).

**Results:** In the early nineties, the etiology of 70% cases of chronic urticaria is unknown and is appropriately labeled as chronic idiopathic urticaria. Of late, the discovery and emergence of autoimmune mechanisms as a cause of chronic idiopathic urticaria has open a Pandora's box and is attributed to autoimmune antibodies against a subunit of high affinity IgE receptor alpha (FceRla), autoimmune IgG anti IgE autoantibody, to a protein that is not an immunoglobulin and to food additives that is able to stimulate the release of histamine from mast cells and basophiles receptors nevertheless.

Towards the year 2000, the first  $3^{rd}$  generation antihistamine was introduced and is now available and more of its kind are coming in the near future. The first  $3^{rd}$  generation antihistamine Fexofenadine was found to control the appearance of the urticaria effectively. Furthermore, it has a safety profile not associated with sedation, drug interaction, cardiac toxicity observed in the  $1^{st}$  and  $2^{nd}$  generation of antihistamines. It can be used for a longer duration at once a day intake.

More 3<sup>rd</sup> generation antihistamines are being introduced recently. It is an ideal symptomatic treatment of chronic idiopathic urticaria. Assuming that histamine is the major root cause of all forms of urticaria, antihistamine will be an important treatment drug in controlling symptoms of urticaria and other immediate type hypersensitivity reactions.

**Conclusion:** Chronic Idiopathic Urticaria is a disorder that has been demonstrated to have multiple etiologic causes but with a common pathologic pathway associated with the release of histamine and other minor mediators causing the classical wheal and flare reaction associated with urticarial lesions. While awaiting the results of several ongoing studies to determine further the root causes or etiology of chronic idiopathic urticaria employing innovative diagnostic schemes and laboratory investigations, it may be prudent meanwhile, to use a long-acting, efficacious, non-sedating 3<sup>rd</sup> generation antihistamine with its wide margin of safety. This drug however, has very little efficacious effect on urticarial vasculitis save for the symptomatic treatment of itching associated with this disorder. Presumably because the allergic type reaction associated with the classic immediate Type 1 hypersensitivity reaction is not in operation in urticarial vasculitis but is due to type 3 hypersensitivity reaction attributed to immunocomplex formation causing inflammation along vascular vessel walls. (Author's abstract)

Keywords: Medicine, Chronic idiopathic urticaria (CIU), Antihistamine, Chronic urticaria, Patho-physiologic mechanism

The Journal of the Philippine Medical Association, Volume No. Centennial issue Issue No. , 67-80 (Filipiniana Analytics) Fil(S) R97.5 P57 2004

# The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines

Belizario, Jr., Vicente Y., De Leon, Winifreda U., Solon, Juan Antonio A., Marquez, Agnes I., Galang, John Mark T., Valderama, Ma. Theresa G.

A cross-sectional survey was done in Casiguran which sought to describe the clinical epidemiology of pulmonary paragonimiasis in relation to pulmonary tuberculosis. Patients with tuberculosis-like symptoms were interviewed and were asked to submit sputum specimens for diagnosis of Paragonimus by sodium hydroxide concentration technique and Mycobacterium tuberculosis by Ziehl-Neelsen staining. Of 252 patients included, all greater than 15 years of age, 63 patients (prevalence of 25.0%) were sputum positive for lung fluke ova. Age-and sex-specific sputum positivity rates were not markedly different from the overall prevalence. Paragonimiasis patients came from almost all barangays with most patients coming from Sta. Cruz where 13 out of 34 patients (prevalence of 38.2%) were found to have paragonimiasis. Seven patients who were earlier diagnosed to have tuberculosis based on chest x-ray findings (mostly "infiltrative") and who were presumably sputum negative for acid fast bacilli, were found to have paragonimiasis. Chronic cough and hemoptysis were the most common presenting symptoms. Only 10 patients (4.0%) were sputum positive for acid fast bacilli. Among 242 sputum negatives, 61 patients (25.2%) were documented to have paragonimiasis. Two patients were sputum positive for both Paragonimus and acid-fast bacilli. Paragonimiasis patients were treated with Praziquantel (25 mg/kg, 3 times daily for 3 days) and were followed up two months post-treatment. Follow up ra te was 85.7% (54 out of 63), and only 57.4% reported clinical improvement. Five out of 47 patients who submitted follow up sputum specimens were still sputum positive . for Paragonimus. Results of this cross-sectional survey show that screening for both Paragonimus and tuberculosis in endemic areas or among patients from known endemic areas is invaluable in coming up with a definitive diagnosis which will make possible appropriate treatment. Further studies on the treatment for paragonimiasis may help establish the effectiveness of Praziguantel in achieving cure as well as describe possible factors affecting reinfection. (Author's abstract)

**Keywords:** Medicine, Clinical epidemiology, Pulmonary paragonimiasis, Pulmonary tuberculosis, Paragonimus, Lung fluke, Mycobacterium tuberculosis, Acid-fast bacilli, Chronic cough, Hemoptyis, Sputum examination

, Volume No. Issue No. , 45-64 (Filipiniana Analytics) Fil(S) Q179.9 N323 v.5 1998

# The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines

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**Keywords:** Medicine, Paragonimus, M. tuberculosis, Paragonmiasis, Tuberculosis, Laboratory diagnosis, Surveillance

, Volume No. Issue No. , 45-64 (Filipiniana Analytics) Fil(S) Q179.9 N323 v.5 1998

#### Clinical techniques for brachytherapy of head and neck tumors Calaguas, Miriam Joy C.

A total 'number of 36 patients with head and neck cancers were treated using high dose rate brachytherapy from the period September 1994 to February 1996. Brachytherapy techniques were classified into four (4), namely, transnasal, surface mold application, intralumenal, and interstitial, and was combined with external beam therapy.

Preliminary results showed that 47% (17/36) of the total number of patients had complete response as evident in the follow-up CT scan or clinical examination, 33% (12/36) had partial response, and 3% (1/36) did not respond to treatment . 17% (6/36) lost to follow-up. Factors such as total radiation dose received, stage and extent of disease, and irradiated volume were considered in the detailed evaluation of responses. (Author's abstract)

**Keywords:** Medicine, Brachytherapy, Transnasal, Surface mold application, Intralumenal, Interstitial, External beam therapy

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No., 171-174 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

0442

#### Clinical trial of Vitex negundo tablet as antitussive

#### Cortes-Maramba, Nelia P., Dela Fuente Dans, Leonila, De Leon, Dina, Ramos, Solita P., Del Rosario, Wilfredo A., Aquino, Hi

III clinical trial using the randomized, double-blind, placebo А phase controlled design was used to determine the efficacy, safety and acceptability of lagundi (Vitex negundo) tablets. The subjects were patients who were otherwise healthy except for complaints of acute non-bacterial cough of mild to moderate severity as defined in the protocol, with no previous cough medications within two days of consultations. A total of 119 subjects participated the in study.

Forty (40) pediatric patients completed the study: twenty one (21) received the lagundi therapy and nineteen (19) the placebo. Each group was further subdivided into 2 groups: younger and older children. Demographic characteristics of the subgroups were comparable as to age, sex, duration of illness and intake of previous medications. Evaluation of patients every three days gave the following results:

Lagundi treatment of acute cough of non-bacterial etiology effectively decreased the frequency or coughing in children of all groups and improved the color of phlegm in older children by the 3rd day of dosing. With placebo treatment, cough frequency decreased by the 6th day. There were no adverse effects noted or reported by the children or their guardians and both placebo and lagundi tablets were acceptable as to taste and smell. Patient compliance medications was comparable to in the two treatment groups. Three patients dropped out from the study: two developed tonsillitis while one patient did not return follow-up. for

All thirty one (31) adult patients with mild cough completed the study, 15 in the placebo and 16 in the lagundi group with comparable demographic characteristics, laboratory results and clinical histories.

Statistical analysis of the subjective and objective parameters showed no statistically significant difference in their responses. However, a notable trend in response favored the lagundi group with relief of expectoration and dyspnea in 87.5% of patients by the 9th day of lagundi therapy compared with 66.7% with placebo use. Peak respiratory flow rate values did not change significantly with either treatment.

All forty five patients with acute cough of moderate severity completed the study. The profiles of patients in the two group were comparable. Lagundi treatment resulted in statistically significant increase in PEFR and decrease in respiratory rate by the 6th day of administration when compared with placebo. Based on clinical parameters, there was no significant difference in response to therapy in the two treatment groups, whether evaluated by patient or by physician at each visit.

Evaluation on the 9th day of therapy showed that there were more poor responders among the placebo group (26%) with moderate cough and 28.5% with mild cough compared with lagundi (6.6% and 6.25% respectively). The incidence of adverse effects was comparable: 24.32% among lagundi group and 20.5% with placebo. Sedation was the predominant complaint among placebo treated patients; there was no predominant adverse reaction among the lagundi treated subjects. Patient compliance and tablet acceptability were comparable with the use of lagundi or placebo tablets. (Author's abstract)

Keywords: Medicine, Lagundi, Vitex negundo L., Double-blind,, Placebo

Lagundi (Vitex negundo L.) monograph, Volume No. Technical Report series #6 Issue No., 25-66 (Filipiniana Analytics) Fil(B) R850.A1 P5 1989

### The clinical utility of gated spect in myocardial perfusion imaging Santos-Ocampo, Carlo D.

The availability of technetium based perfusion agents has opened up a Pandora's box of several new applications for myocardial perfusion scintigraphy. Technetium based agents have allowed a much higher increase in the amount of injected radioactivity compared to thallium. This translates to higher count rates making the performance of gated myocardial perfusion studies feasible.

Gated SPECT perfusion imaging can be easily performed by most nuclear laboratories. It is useful in determining whether non-reversible defects are real or artifactual (e.g. breast or diaphragm) in nature. Laboratories that perform "stress only" ("Express") protocols might effectively use this tool in the assessments of defects. Clinical interpretation may be based on whether the myocardium in the photon'-deficient area contracts or thickens. Most importantly, gated SPECT provides an information about the left ventricular important ejection fraction--the single most cardiac parameter for determining prognosis

This new technology enables the nuclear cardiology laboratory to provide assessments of both myocardial perfusion and ventricular function--the two strongest predictors 'of clinical outcome. (Author's abstract)

Keywords: Medicine, Gated spect, Myocardial perfusion, Ventricular function

Dengue remains an endemic viral disease affecting the tropical and subtropical regions of the world. While the pathophysiology of dengue infection remains to be fully understood, diagnosis of dengue based on clinical symptoms is oftentimes unreliable, requiring a rapid laboratory based diagnostic test.

The role of the dengue non-structural protein 1 (NS1) in viral pathophysiology has not yet been fully understood. In this regard, the NS1 protein of dengue virus opens up a lot of opportunities for research on how Biorad<sup>TM</sup> Dengue NSI Ag STRIP is based on the qualitative detection of the NS1 antigen. Here we describe the detection, cloning and expression of dengue NS1 protein aiming to develop a rapid diagnostic kit that would detect and quantitate anti-NS1 antibodies.

Briefly, primers for NS1 were designed from consensus sequences of dengue serotypes 1 and 2. After PCR amplification, the 1056 bp NS1 amplicon was inserted into the pCR@8/GW/TOPO@TA (Invitrogen) vector and transfected into the One Shot@ Chemically Competent *E. coli* (Invitrogen). For the expression of the recombinant protein, PCR amplicons were ligated into the pET SUMO (Invitrogen) expression vector and transfected into the Mach1<sup>TM</sup>-T1@ cells for storage or BL21 (DE3) cells for expression using IPTG. Gene inserts and orientation were checked by PCR.

We have successfully expressed a 53 kDa recombinant histidine-tagged recombinant NS1 protein. This was further purified using the TALON<sup>TM</sup> Superflow<sup>TM</sup> Metal Affinity Resin (BD Biosciences). Immunoreactivity of the dengue rNS1 protein is currently being evaluated by using serum samples from the dengue serum bank archived at St. Luke's Medical Center. (Author's abstract)

Keywords: Medicine, Dengue, Non-structural protein 1, Recombinant protein, Molecular diagnostics

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 150-151 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### 0445

# Community-based surveillance for drug resistance of mycobacterium tuberculosis in selected areas in the Philippines

Mendoza, M. T., Tan Torres, T. T., Ang, C. F., Arciaga, R., Elona, F., Retula, M., Cruz, N., Mantala, M.

Introduction and Objectives: Hospital based reports on multi-drug resistant tuberculosis (MDR TB) in the Philippines are alarmingly high. To determine prevalence of drug resistant tuberculosis in the population, a community-based surveillance was done in selected areas representing North Luzon (La Union), National Capital Region (Metro Manila), Visayas (Leyte) and Mindanao (Zamboanga). This study also describes the prevalence of initial and acquired MDR-TB in these selected areas.

Design: Sentinel Site Surveillance

**Materials and Methods:** Regional TB laboratories were set up at La Union and Zamboanga which started with the training of medical technologists on culture isolation and drug susceptibility test of Mycobacterium tuberculosis. Sputum specimens from newly registered TB symptomatics consulting at the community health centers were

collected. Data on clinical signs and symptoms, history of previous anti-TB treatment, chest x-rays and AFB smear results done by the health centers' microscopist were also collected. The number of patients studied per region was targeted at 10% of the estimated smear (+) cases. The surveillance was undertaken in 2 phases: 1996 and 1999.

**Results:** In 1996 the prevalence of MDR TB in Metro Manila areas was 6.2% (95% CI 3.0, 9.4) with an initial drug resistance of 0.94% and acquired drug resistance of 5. 3%. In La Union, MDR rate was 4.44% (95% CI 0. 75,13.2) all initial resistance. In Zamboanga, MDR rate was 5. 74% (95% CI 3.15, 9.56) with 3.8% initial drug resistance and 1.9% acquired drug resistance. The overall MDR rate from combined 1996 data was 95% CI. During the second phase in 1999, the MDR rate in Leyte was 5.9% (95% CI 2.00,10.00) all classified as initial drug resistance. There was a higher MDR rate in La Union e.g. 15.7% (95% CI) in 1999. The rate in Zamboanga was 0% (95% CI 0.00).

**Conclusion:** MDR-TB was prevalent in the population surveyed and regional differences in the prevalence of MDR TB were noted. Initial MDR rates ranged from 4.4% to 15.7%. TB control efforts should be "tailored" according to the needs of the community. Community based sentinel site surveillance should be maintained and MDR TB monitored in the areas developed. DOTS strategy should be adopted in regions with prevalent MDR TB. (Author's abstract)

Keywords: Medicine, Mycobacterium tuberculosis, Sputum, Chest x-rays

Philippine Health Systems Research: a scientific publication of DOH-funded researches 2000-2001, Volume No. 1 Issue No., 17-26 (Filipiniana Analytics) Fil(S) RA440.85 P543 2001

#### 0446

# Comparative effectiveness of an iron-fortified product with the sangkap pinoy seal and ferrous sulfate on the hemoglobin and hematocrit levels of five year old pre-school children at the Eskwelahang Munti Barangay Potrero, Malabon City Sembrano, Lawrence N., De Leon-Aspra, Cathrina, Sacro, Cecilia M.

Objectives: To determine the effectiveness of the iron-fortified chocolate drinks with the Sangkap Pinoy Seal on the hemoglobin, hematocrit and RBC indices among five year old pre-school children of the Eskwelahang Munti Barangay Potrero, Malabon City. Materials & Methods: Five-year old pre-school children enrolled at the Eskwelahang Munti Barangay Potrero, Malabon City were taken blood samples. Blood was drawn through skin puncture by a trained medical technologist. Baseline hemoglobin, hematocrit and RBC indices were taken. Children chronic with histories of acute and illness', blood dyscrasias, current febrile illness and severe anemia (Hb<8g/dl) were all excluded in the study. The subjects were divided into control and experimental groups, and dewormed by giving Mebendazole 250mg/paper tab single dose prior to treatment. The control group received ferrous sulfate syrup 1.7ml (containing 8.9mg of elemental iron) once daily for 6 weeks. The experimental group was given iron-fortified chocolate drink with the Sangkap Pinoy Seal, one glass (containing 8.9mg of elemental iron) a day also for 6 weeks. The two groups were supervised by 2 research assistants. Repeat hemoglobin, hematocrit and RBC indices determination were done by the same medical technologist. The results obtained were tabulated and subjected to statistical analysis. Results: The study showed that the iron-fortified chocolate drink and ferrous sulfate had a significant effect on both the Mean Corpuscular Volume (MCV) and Mean Corpuscular Hemoglobin (MCH). But it was the iron-fortified chocolate drink that was more effective in increasing the hemoglobin, hematocrit and RBC levels among the 5 year old prechildren Eskwelahang Barangay Potrero. school at the Munti Malabon City. Conclusion: Based on the results of the study: 1.) The iron-fortified chocolate drink increased significantly the hemoglobin, hematocrit and RBC levels among the five year old pre-school children. while the ferrous sulfate

supplement did not increase significantly, and 2.) Comparing the increase in the hemoglobin, hematocrit and RBC levels between the 2 groups, there is significant difference favoring the iron-fortified chocolate drink relative to the ferrous sulfate supplement. (Author's abstract)

Keywords: Medicine, Iron-fortified, Sangkap pinoy seal, Hemoglobin, Hematocrit, Ferrous sulfate

The Filipino Family Physician, Volume No. 46 Issue No. 3, 121-132 (Filipiniana Analytics) Fil(S) R97.4 F2 46/3 2008

0447

# The comparative effects of purified fractions of *Vitex negundo L.* (lagundi) and crude extracts of *Cassia alata L.* (akapulko) and *Artemisia vulgaris L.* (damong maria) on inflammatory processes. *In vitro Tigno, Xenia T., Francisco, Angelica D.*

In summary, four tests were employed to characterize inflammatory activity: phagocytosis, chemotaxis, the alternative and classically-mediated hemolytic pathways. An enhancement of any of the above processes would indicate an elevated natural immune response and therefore an activity which would promote inflammation. A suppression of any of the following processes would indicate a possible effect towards inhibiting inflammation. (Author's summary)

**Keywords:** Medicine, Vitex negundo L. (lagundi), Cassia alata L. (akapulko), Artemisia vulgaris L. (damong maria), In vitro, Purified fractions, Crude extracts, Inflammatory processes

NRCP Research Journal, Volume No. 3 Issue No. 2, 39-54 (Filipiniana Analytics) Fil(S) Q179.9 N323 3/2 1993

0448

## A comparative study on the treatment outcome of tuberculosis patients managed in a PPM-DOTS center by type of treatment partners *Mangubat, Rey Sergio A.*

**Objective:** To compare the treatment outcome of TB patients managed in CIM-CMSS PPM-DOTS Center, Paknaan, Mandaue City as to the type of treatment partners. **Materials & Methods:** This is a cross sectional study conducted at the CIM-CMSS PPM-DOTS Center in Paknaan, Mandaue City. All TB patients enrolled in the center who completed the TB treatment regimen between October 1, 2004 to October 31,2007 is the population studied. The patients were classified according to treatment partner and treatment outcome. Chi square value at 95% level of significance was computed. **Results:** There were a total of 201 patients (55% male, 45% female). Treatment outcomes revealed 54.5% were cured, 37% completed treatment, 0.5% failure, 2% died and 3% each for defaulters and transfer-out. The treatment partner with the highest proportion of cured patients is the family member (66%), followed by DOTS nurse (59%). Patients supervised by company nurses showed a high proportion of treatment completed. Chi-square test comparing treatment outcome to treatment partners showed no significant difference in the computed values at 95% confidence interval. **Conclusion:** There is no significant difference in the treatment outcomes of the patients with varying treatment partners. **(Author's abstract)** 

Keywords: Medicine, Treatment outcome, Tuberculosis, PPM-DOTS center

The Filipino Family Physician, Volume No. 46 Issue No. 3, 141-151 (Filipiniana Analytics) Fil(S) R97.4 F2 46/3 2008

# Comparative study on the use of fourth finger technique versus standard technique of intradermal injection of anti-rabies vaccine Llano Maria Corazon T., Certeza, Hermogenes, Landagan, Ma. Cristina, Cruz, Rafael B.

Rabies is a fatal disease which has been known for ages. Treatment for this varies according to the category of the animal bite, with use of rabies vaccine in all categories. In our country, injection is given intradermally using the

standard technique. A newly developed technique used by the author, known as 4th finger technique is tested in this study to determine whether this can be used as an alternative. **Objective:** The general objective of this study was to compare the use of standard technique and the fourth finger technique of intradermal injection of antirabies vaccine in 2 dog bite centers in Rizal province. **Design:** Analytical cross-sectional study. **Methodology:** Study patients were divided randomly into 2 groups, those receiving the intradermal rabies vaccine via the standard technique and the 4th finger technique. Demographic profile, level of difficulty, patient reaction to pain and behavior, duration of injection, amount of leakage were used as variables to determine the difference between the two techniques. **Results:** A total of 150 patients were included in the study, divided equally into 2 groups. No significant differences were noted in the demographic profile, level of difficulty, patient reaction to pain and behavior, duration of injection between the 2 groups, however, the amount of leakage was significantly noted in the standard technique. **Conclusion:** The 4th finger technique is comparable with the standard technique of intradermal injection of antirabies vaccine. (**Author's abstract**)

Keywords: Medicine, Rabies, Fourth finger technique, Intradermal injection, Anti-rabies vaccine

The Filipino Family Physician, Volume No. 46 Issue No. 4, 202-209 (Filipiniana Analytics) Fil(S) R97.4 F2 46/4 2008

# Complementary alternative medicine usage among diabetic patients of Ospital ng Maynila Medical Center from January 2004 - June 2005 *Tiglao-Lim, Maria Poncesca*

A survey on knowledge, attitudes and practices of Filipino family physicians on alternative medicine was done in 1999 noting that majority of the Filipino family physicians were aware of the different alternative approaches but still find the practice of alternative medicine unacceptable. While these sentiments may still reflect present opinion alternative among physicians, we are being overtaken by various "products" that our patients may need guidance with, thus the need to find out how many of our own patients use these alternative modalities/medicines and how. Objectives: To determine complementary alternative medicine usage among diabetic patients consulting at Ospital ng Maynila Medical Center. Study Design: Analytical Cross-Sectional Study. Setting: Family and Community Medicine & Internal Medicine Diabetic Clinics, Ospital ng Maynila Medical Center. **Results:** The study population consisted of 101 diabetics, whose mean age was  $63 \pm 9$ , with the

most number at 60-69 y/o (65.3%), mostly female (73.3%), married (58%), with educational level reaching high school (59%) and a great majority without any declared income (86.1%). Majority of surveyed subjects (61.4%) affirmed use of complementary alternative medicine. Herbal medicines were noted to have the highest utilization at 77.35 percent with the rest of modalities such as acupuncture/acupressure at 6 percent and below. Television ranks first (20.8%) followed closely by relative's/friend's recommendation ( $\setminus$  9.8). Interestingly, physician's advise as a source of information (11.9%) was greater than radio (8.9%) and way ahead of printed media (2.0%). Respondents of this survey mostly used complementary alternative medicine for more than year (34.92%) foll owed closely by one month-to-six month's use (31.74%). Respondents, however, are relatively at 50 percent in considering CAM as cure, which, evidence-based studies have yet to extensively prove. **Conclusion:** In conclusion, there are variable factors that involve use of complementary alternative medicine including perceived low cost, perception of cure for disease and perceived lack of adverse effects among others. This may, in part, explain why our diabetic patient respondents choose to use complementary alternative medicine, half with their doctor's permission and half without. (**Author's abstract**)

Keywords: Medicine, Alternative medicine, Diabetes, Herbal medicines, Acupuncture, Acupressure

The Filipino Family Physician, Volume No. 46 Issue No. 1, 1-8 (Filipiniana Analytics) Fil(S) R97.4 F2 46/1 2008

0451

### Coronary-cameral fistula: a case report Lazaro, Maria Eloisa R.

This paper aims to present a rare case of a left coronary artery fistula to the right ventricular outflow tract in an otherwise structurally normal heart. To discuss its epidemiology, etiology, clinical features, differential diagnosis, pathophysiology, approach to diagnosis, treatment options and its prognosis. (Author's objectives)

Keywords: Medicine, Coronary artery fistula, Epidemiology, Etiology, Clinical features

The Journal of the Philippine Medical Association, Volume No. Centennial issue Issue No., 110-115 (Filipiniana Analytics) Fil(S) R97.5 P57 2004

# Cross-sectional study of the alcohol use among elderly patients seen in the Veterans Memorial Medical Center Medical Out-Patient Clinic using alcohol screening aid of the National Institute on Alcohol Abuse and Alcoholism Velez-Tirante, Glenda, Villaraza, Balthazar

Alcohol causes diseases such as cirrhosis of the liver and exacerbates symptoms in existing condition such as diabetes. In addition, alcohol is implicated in many social and psychological problems, including family conflict, arrests, job instability, injuries related to violence and accidents and psychological symptoms related to depression and anxiety. **Objective:** This study aimed to determine the prevalence and alcohol use among elderly patients at VMMC Medical Out-patient Clinic using an alcohol screening questionnaire. **Method:** The study was conducted at the VMMC Medical Out-patient Clinic from March 2004-2006.

Subjects included were male/female aged 60 and above and current alcohol drinkers. The patients were personally interviewed by the researcher using the Physician's Guide to Helping Patients with Alcohol Problems published by the National Institute of Alcohol Abuse and Alcoholism (NIAAA), which presents a brief model for screening and assessing problems with alcohol. Results: Two hundred forty six (82%) of the 300 elderly alcohol drinkers at VMMC-OPD were male. The subjects were mostly (90%) aged 60-74 years and only 30 (10%) were aged more than 75 years old. For the frequency of alcohol use, 120 subjects (40%) drink alcohol 2-4x a month, have it less than once a month, 67 (22.3%) have it 2-5x a week of alcohol drink and only 18 (6%) drink daily or almost daily. With regards to quantity of alcohol use, 103 subjects (34.3%) had 2 drink/occasion, 85 (28.3%) use I or less drink/occasion, 103 (18.7%) had 4 drinks/occasion, 38 (12%) had 3 drinks/occasion, and lastly 18 (6%) had more than or equal to 5 drinks/occasion. Male and female subjects aged 60-74 years old were mostly problem drinkers, 50% (123 male and 27 female), 38% were at risk drinkers (94 male and 20 female). However, there is significant difference in problem drinkers and at-risk drinkers in terms of sex and age-group. Only 3% (9 males) were categorized as alcohol dependent drinkers. Conclusion: Based on this study, alcohol drinking in the elderly at VMMC OPD is prevalent, thus preventive efforts on the part of family physicians are important because alcohol use contributes to many problems: serious health social and and physicians can successfully influence drinking behaviors. The effects of alcohol may be increased in elderly patients because of pharmacologic changes associated with aging. Interactions between alcohol and drugs, prescription and over-thecounter, may also be more serious in elderly persons . (Author's abstract)

Keywords: Medicine, Cirrhosis of the liver, Alcohol screening aid, Exacerbates symptoms, Diabetes

The Filipino Family Physician, Volume No. 46 Issue No. 1, 34-40 (Filipiniana Analytics) Fil(S) R97.4 F2 46/1 2008

### Cultural diversity: the Filipino client providing culturally sensitive education on breast cancer and early screening Ortin, Erlinda L.

All cultures, in particular the Filipino culture are designed to maintain the health and welfare of its members. By drawing on the richness of natural cultural support system analyzed through the different phenomenon and integrating with them the Western therapeutic techniques, it is envisioned that the Filipino-women would most likely utilize screening services and increase their rate of early detection and access to optimal treatment for breast cancer. By addressing the culture specific needs, the effectiveness and efficiency of screening and early detection efforts would increase to reach the common objective of reducing the burden of breast cancer for all women. (Author's summary)

Keywords: Medicine, Health, Welfare, Cultural diversity, Western therapeutic techniques

Philippine Journal of Nursing, Volume No. 68 Issue No. 1-2, 22-29 (Filipiniana Analytics) Fil(S) RT1 P53 68/1-2 1998

	А	rapid	and	efficient	method	of	propagating	Lagundi	was	established	using
basal						ster	m			(	cuttings.

Some growing conditions affecting favorable growth and development were determined. Fresh Ipil-ipil leaves as fertilizer applied 2 weeks after planting gave higher herbage yield than unfertilized ones. It appears to tolerate extreme conditions like waterlogging and drought. Growth is better under full sun than in the shade. Crop protection problems and recommended control are given.

Guidelines in harvesting (time of harvest, frequency, method) and postharvest handling (drying, storage) are also enumerated. (Author's abstract)

Keywords: Medicine, Vitex negundo L., Verbenaceae, Lagundi

Lagundi (Vitex negundo L.) monograph, Volume No. Technical Report series #6 Issue No., 1-13 (Filipiniana Analytics) Fil(B) R850.A1 P5 1989

#### 0455

# Cyclosporin analysis in blood by automated reserved-phase high performance liquid chromatographic method coupled with solid phase extraction and speed vacuum evaporation

#### Portilla, Ma. Cristina B., Cantorias, Melchor V., Pascual, Cherrie B.

Cyclosporin A (CyA) is a cyclic undecapeptide drug used in combating tissue rejection after organ transplant. High cyclosporin doses may lead to nephrotoxicity while a dose below the therapeutic level increases the probability of transplant rejection. A rapid HPLC analysis was developed for the estimation of cyclosporin in blood using a PC 1000 software and autosampler for routine analysis. The mobile phase consisted of acetonitrile: methanol: water (50:30:20) while the analytical column was a  $C_{18}$  column maintained at 75°C with UV detection set at 214 run. Whole blood samples, spiked with the internal standard cyclosporin D (CyD), was added with protein precipitating agent, centrifuged, and applied to a disposable solid phase  $C_{18}$  column to rapidly extract the CyA and CyD. The extracting solvent was removed by using a speed vacuum apparatus. Average retention times were 8.1 min for CyA and 10.0 Linear calibration min for CyD. curves were obtained from 0-500 mg/mL with average correlation coefficient of 0.995. Calibration standards with increasing concentrations of CyA and fixed concentration of CyD were spiked in blood from healthy volunteers and subjected to the same preparation as CyA-containing blood samples. CyA concentrations in blood samples were determined using internal standard addition mehod (by area ratio of CyA to CyD) and the obtained calibration curve. This analytical technique is useful in monitoring cyclosporin level in transplant patients. (Author's abstract)

**Keywords:** Medicine, Cyclosporin, High performance liquid chromatography, Reversed-phase, Solid phase extraction, Speed vacuum, Immunosuppressive drug, Whole blood, Chromatography, Internal standard addition method

Transactions of the National Academy of Science and Technology, Volume No. Issue No., 309-310 (Filipiniana Analytics) Fil(S) Q149.P5 N25 v.22 2000
#### Dengue fever profile in the province of South Cotabato Vencer-Malaluan, Angeles, Sumagaysay-Abantao, Marilyn

A 5-year retrospective review from year 2000-2004 was done to determine the demographic and clinical profiles of patients diagnosed to have dengue fever at the South Cotabato Provincial Hospital, City of Koronadal, South Cotabato. Methods: A total of 654 patients from different municipalities of South Cotabato were admitted at the hospital. They were clinically diagnosed to have dengue fever, dengue hemorrhagic fever. Results: There were 348 (53%) males and 306 (47%) females. Their ages ranged from less than I year to more than 50 years of age. Higher number of cases were seen among ages 10-19 years old, 236 (36%) and 1-9 years old, 219 (33.5%). Majority of dengue cases were seen in the City of Koronadal [268 (41 %)], attaining its peak during rainy months of July [113 (17%)], August [89 (13.6%)] and September [80 (11%)]. Fever (100%) and positive torniquet test (71%) were the constant findings. Other clinical signs and symptoms were: Herman's rash (25%), epistaxis (21%), melena (4%) and gum bleeding (1.5%). **(Author's abstract)** 

Keywords: Medicine, Dengue, Hemorrhagic fever, Herman's rash, Epistaxis, Melena, Gum bleeding

The Filipino Family Physician, Volume No. 45 Issue No. 1, 8-11 (Filipiniana Analytics) Fil(S) R97.4 F2 45/1 2007

0457

#### Determinants of compliance to therapeutic regimen among selected Filipino juvenile diabetics *Cruz, Jayvee G.*

By the end of the century, more than one hundred million people will have diabetes. Much of the increase will come from underdeveloped and underprivileged communities like the Philippines. Juvenile diabetes, the type which afflicts children and young adults, constitute approximately twenty percent of the entire diabetic populace. Compliance to the therapeutic regimen among these age groups persist as a challenge for nurses and other members of the health care team. If their condition remains poorly controlled, the unwanted and almost fatal complications will be evident in ten years. (Author's abstract)

Keywords: Medicine, Therapeutic regimen, Demographic variables, Regimen-associated variables, Psychosocial variables

Philippine Journal of Nursing, Volume No. 67 Issue No. 3-4, 25-26 (Filipiniana Analytics) Fil(S) RT1 P53 67/3-4 1997

0458

#### Diabetes and childbearing: exploring the options Lacuna-Alip, Myrissa

In spite of the advances in modern medicine, the high incidence of morbidity and mortality in infants born to mothers with Type 1 and Type 2 DM has been a source of constant concern. There is a high occurrence of congenital fetal malformations, likewise, studies have established an association between elevated maternal glucose

and glycosylated hemoglobin during embryogenesis and high rates of spontaneous ~bortions. Unexpected pregnancies occur in plenty of diabetics, women who do not have satisfactory preconception care. Therefore, this population would benefit so much from counseling on the risks of unplanned pregnancies and poor metabolic control. (Author's abstract)

Keywords: Medicine, Diabetes, Maternal glucose, Glycosylated hemoglobin, Embryogenesis

The Filipino Family Physician, Volume No. 46 Issue No. 3, 179-183 (Filipiniana Analytics) Fil(S) R97.4 F2 46/3 2008

0459

#### Dosimetry application of gate in prostate brachytherapy Maratas, Jan Mickelle V., Nawang, Salasa A.

Radiation therapy is a common practice in eliminating cancerous cells. However, nontargeted neighboring tissues will also be exposed to these radionuclides which cause probable risks. Thus, there is a need for a reliable estimation of the absorbed dose from the use of radioactive therapeutic agents. Simulation tools for dosimetry applications are routinely used to assess the success of the therapy. This study evaluated the features of GATE (Geant4 Application for Tomographic Emission) specifically for use of <sup>125</sup>I (Iodine-125) radiation seeds for prostate cancer therapy. A voxelized Zubal medical torso phantom was utilized to model all major internal organs of the human body including the prostate. Sixty four radiation seeds of 125I with radioactivity set to 10 kbeq, were implanted with an even distribution covering the whole volume of the prostate.

Three post-implant dosimetry assessments were calculated to determine the efficacy of the therapy. Calculations for the time dose pattern after 10 minutes of irradiation yielded average absorbed dose rate values of  $1.532898 \times 10^{-4}$ Gv/s and 2.279397 x 10<sup>-5</sup> Gv/s, for the whole body and prostate gland, respectively. It therefore infers that approximately 14.8% of the absorbed radiation was in the target organ prostate and the remaining 85.2% were absorbed by surrounding nontarget tissues. The results also show that the uniform seeding distribution pattern of the 1251 throughout the prostate gland resulted to a nonuniform dose distribution as depicted in an isodose contour plot which made use of a cross-sectional view of the target organ. A cumulative dose-volume histogram generated a summary of the dose received by the prostate after ten minutes of irradiation.

GATE simulation toolkit illustrated its capacity for dosimetry applications to prostate brachytherapy and possibly for any kind of brachytherapy with arbitrary source geometry and strength. (Author's abstract)

Keywords: Medicine, GATE, Brachytherapy, Radiation dosage, Iodine-125

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 154 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0460

The effect of banana fruit (*Musa sapientum*) as adjunct to ranitidine in the management of uninvestigated dyspepsia *Guinto, Rosemarie M.* 

Objective: To determine the efficacy, safety and cost-effectiveness of banana fruit as an adjunct to ranitidine in the management of uninvestigated dyspepsia. Design: Therapeutic Clinical Trial Setting: Government Tertiary Hospital Study Subjects: Patients aged 18 to 45 who are diagnosed with uninvestigated dyspepsia for the first time at Quezon City General Hospital-Family Medicine-Out Patient Department. Methodology: The study was conducted from July to September 2006. Out of 191 subjects, 151 were included in the study. Using the systematic sampling method, patients were assigned to either Group I, (75) or Group II (76). Ranitidine 150mg/tab 2 times a day for 2 weeks was given to Group I, whereas, 1 piece Banana fruit 3 times a day was added to the same dose of Ranitidine in Group II. The De Luca Mean Global Symptom Index Scoring was used in a questionnaire guide to monitor the improvement in the severity of symptoms during the course of treatment. Efficacy, cost-effectiveness and occurrence of adverse effects were compared in both groups. Data were encoded into Epi Info 6, Epistat and SPSS 10 software. Results: There were 151 subjects who completed the study. The mean age of Group I was 31 .8 and 32.0 for Group II. Both groups had more females [Group 1=39(52%), Group 11=41(54%), single [Group 1=46(61)%), Group 11=43(57%)), employed [Group I = 53(71 %), Group 11=54(71%)], and high school graduates [Group 1=29(39%), Group 11=30(39%)]. Epigastric pain was the predominant complaint on both groups [Group I=73(97%), Group II-76(100%)]. As to the resolution of symptoms. Group II subjects had their symptoms resolved by the 4th and 7th day follow up regardless of the MGSI score as compared to Group I subjects whose symptoms were relieved on the 4th day of follow-up. Treatment in both groups was proven effective based on the resolution of symptoms within the treatment period; however, there were faster resolution of symptoms in Group II with a mean day of  $4.36 \pm 0.98$  compared to  $5.53 \pm 2.23$  of Group I. No adverse effects were observed in both groups. Group II regimen was more cost-effective than Group I regimen. Conclusion: Banana fruit as adjunct in the treatment of uninvestigated dyspepsia was proven to be effective, safe and cost-effective. (Author's abstract)

Keywords: Medicine, Musa sapientum, Ranitidine, Dyspepsia, Banana

The Filipino Family Physician, Volume No. 45 Issue No. 4, 133-148 (Filipiniana Analytics) Fil(S) R97.4 F2 45/4 2007

### The effect of individual versus group psychotherapy among grade six students with depression Guzman-Natividad, Emylyn L.

Introduction : Depression among children and adolescents is common but frequently unrecognized. It affects 2 percent of prepubertal children and 5-8 percent of adolescents. The clinical spectrum of the disease can range from simple sadness to a major depression or bipolar disorder. Risk factors include a family history of depression and poor school performance. Evaluation should include complete medical assessment to rule out underlying medical causes . A structured clinical interview and various rating scale scales such as Pediatric Symptom Checklist (PSC) and Hamilton Depression Rating Scale (HAM-D) are helpful in determining whether a child or adolescent is depressed and monitor their outcome. Psychotherapy appears to be useful in most children and adolescents of mild to moderate depression. Because of the high risk for school failure and suicide in depressed children and adolescents, prompt referral or close collaboration with a mental health professional is often necessary. Method: A 12-week single blind randomized clinical trial compared students receiving individual psychotherapy versus those with group psychotherapy. Out of 205 students, 51 tested positive for dysfunction using the Pediatric Symptom Checklist; 3 did not have parental consent and only 49 were included in the study. Hamilton Depression Rating Scale was used to test outcomes for each intervention. Data gathered were encoded in the Microsoft Excel and analyzed and statistically interpreted using paired t-test by the aid of Statistical Package for Social Sciences (SPSS) version 12.1. Results: Group psychotherapy treatment group showed significant improvement compared to individual psychotherapy. It was recommended to include mental health programs in schools, offices and clinics . Likewise, the awareness promotion on the benefits of promoting mental health has to be done even up to the national level. (Author's abstract)

**Keywords:** Medicine, Psychotherapy, Depression, Hamilton depression rating scale (HAM-D), Pediatric symptom checklist (PSC)

The Filipino Family Physician, Volume No. 45 Issue No. 4, 159-167 (Filipiniana Analytics) Fil(S) R97.4 F2 45/4 2007

0462

# Effect of trimetazidine on left ventricular ejection fraction and time to develop 1mm ST depression in patients with chronic stable angina: a meta-analysis *Amoguis, Alvin V.*

For many years, there has also been interest in another approach to treating and/or preventing myocardial ischemia and angina pectoris. This approach involves metabolic manipulation of the myocardium. At least four agents may act in this way: etomoxir, perhexiline, ranolazine and trimetazidine. None of these drugs is believed to have a significant inotropic, chronotropic or vasodilator action at rest or during exercise, a very attractive feature for patients already taking multiple vasoactive medications. **Objectives:** The purpose of this systematic review was to investigate the effect of trimetazidine to patients with stable angina in randomised controlled trials. Search strategies: A systematic search was performed with the use of electronic databases, including Medline PubMed, Ovid, the Cochrane Library. Selection criteria: A study was included in this meta-analysis if it was published, randomised, placebo-controlled and it reported the effect oftrimetazidine with placebo on stable angina pectoris and/or myocardial ischemia. Data collection and analysis: Details of the study design, patient characteristics, intervention, duration of therapy were extracted by the author. Analysis was done with the calculation of the weighted mean difference and chi-square test using standard meta-analysis software (RevMan 4.2.3). Main results: The result of our meta-analysis showed that compared to placebo, trimetazidine significantly increases ejection fraction and time to develop 1 mm ST depression during exercise. Overall, the improvement of ejection fraction was 14.67% (CI 12.59 - 16.75). The study was relatively heterogenous in our analysis by chi-square test. This is due to variations in parameters in the included studies as previously mentioned. **Reviewers conclusion:** The result of this meta-analysis suggests that trimetazidine is superior to placebo in increasing the ejection fraction and time to developing 1 mm ST depression in patients with chronic stable angina. However, the overall quality of the included studies weakens the validity of these findings. Except for influenza-like symptoms, there are no studies demonstrating detrimental effects of trimetazidine intake. Therefore, with its other cardiovascular benefits, trimetazidine is good alternative to treating patients with chronic stable angina. (Author's abstract)

Keywords: Medicine, Trimetazidine, Stable angina, Left ventricular ejection fraction

The Filipino Family Physician, Volume No. 46 Issue No. 2, 78-86 (Filipiniana Analytics) Fil(S) R97.4 F2 46/2 2008

0463

The effect of virgin coconut oil on the cholesterol levels of patients with hypercholesterolemia Bernardo-Lazaro, Ma. Rosario C.

Hypercholesterolemia is a common risk factor for cardiovascular risk which is presently being managed with diet and exercise and lipid lowering drugs. Due to the cost and potential harm oflipid lowering drugs, alternative supplemental therapies including the use of virgin coconut oil for hypercholesterolemia, are being explored. Objective: To determine the effect of addition of virgin coconut oil to diet and exercise advice on the lipid profile, weight and body mass index of patients with hypercholesterolemia. Methods: A nonrandomized, open-labeled study was done in 17 patients aged 35-65 years with elevated cholesterol seen at Family Medicine Clinic of Philippine General Hospital from February to September 2006. The six month study period consisted of giving diet and exercise advise in the first three months then adding virgin coconut oil to diet and exercise advice for the last three months . Lipid profile, weight and body mass index were measured monthly. **Results:** There was greater significant reduction from baseline in total cholesterol (-9.9%; P < 0.01) and LDL cholesterol (-15.4%; p<0.01) with diet and exercise advice than with addition of virgin coconut oil. There was a greater increase in HDL cholesterol (+9.4%; p = 0.08) and triglyceride levels (+ 16.4%; P = 0.51) and greater reduction in weight (2.27%; p = 0.04) and body mass index (-2.15%; P = 0.06) with addition of virgin coconut oil to diet and exercise advice than with diet and exercise advice alone. Conclusion : There was an increase in total cholesterol, LDL cholesterol, HDL cholesterol and triglyceride levels and a decrease in weight and body mass index with addition of virgin coconut oil to diet and exercise advice. (Author's abstract)

Keywords: Medicine, Cholesterol, Virgin coconut oil, Hypercholesterolemia, Triglyceride, Cardiovascular risk

The Filipino Family Physician, Volume No. 46 Issue No. 1, 9-17 (Filipiniana Analytics) Fil(S) R97.4 F2 46/1 2008

0464

# Effectiveness of group consensus activity in improving appropriateness of care for the management of adult asthmatic patients in the ambulatory care unit *Limpoco, Anna Guia O., Apostol-Nicodemus, Leilanie S.*

Background: Asthma still remains a major cause of chronic morbidity and mortality in the world. Hence it is important that quality care is given to these patients at any given time. Several methods are explored to further improve physician performance particularly residents-in-training, thus this study was conceptualized. Objective: This study was done to determine whether a workshop allowing residents to set criteria based on a clinical practice guideline improved the appropriateness of care given to adult asthmatic patients in exacerbation as measured by chart audit. Methods: The setting was the Ambulatory Care Unit of the Philippine General Hospital with the first year residents of the Department of Family and Community Medicine for the year 2007 as subjects. This is a "before-and-after" study. The comparison of the difference before and after workshop percentage appropriateness of care in terms of five criteria was the main outcome. Results: The mean age of the first year residents was  $31.57 \pm$ 4.502 years. Four were males and ten females. Mean year graduated from medical school was 5.5 ±.. 4.4 7. From the five criteria, two of them: history taking (93.9%) and assessment (100%) were already above the set standard of 80% prior to the workshop. After the workshop, the percentage appropriateness of care in terms of history taking and assessment was maintained above the set standard. At baseline, three of the five criteria: physical examination (78.8%), treatment (51.5%) and follow up/health education (66.7%) were noted below the set standard. The three improved after the workshop: only physical examination was significant (from 78.8% to 100%, P value = 0.006), treatment improved but still below the set standard (from 51.5% to 60.6%) while follow up/health education (from 66. 7% to 81.8%) was slightly above set standard. Conclusion: Workshop allowing the residents to have their own set of criteria based on a clinical practice guideline as an intervention for quality improvement is an effective tool in improving appropriateness of care in terms of physical examination. However, there seemed to have a need for repeated measures to further attain acceptable levels of appropriateness of care. (Author's abstract)

Keywords: Medicine, Appropriateness of care, Workshops, Physician performance

The Filipino Family Physician, Volume No. 46 Issue No. 3, 133-140 (Filipiniana Analytics) Fil(S) R97.4 F2 46/3 2008

# The effectiveness of the use of soybean powdered drink as supplement to lipid lowering agents vs. lipid lowering agents alone in hypercholesterolemia *Balane, Arlan Rosegrace S.*

Hypercholesterolemia is the presence of high levels of cholesterol in the blood, a metabolic derangement that can be secondary to many diseases and can contribute to cardiovascular disease. High cholesterol can cause the formation and accumulation of plaque which results in atherosclerosis that can lead to plaque ruptures and blockages in the arteries, which increase the risk for heart attack, stroke, circulation problems, and death. Objective: To determine the effectiveness of the use of soybean powdered drink and lipid lowering agents vs. lipid lowering agents alone in the reduction of total cholesterol levels among patients diagnosed with hypercholesterolemia using a randomized controlled trial. Method: The study is a randomized controlled trial consisting of two groups, a treatment group given soybean powdered drink and a lipid lowering agent, and a control group given the lipid lowering agent alone. The study population recruited a total of 30 patients aged 30-72 years old, consulting at the UP-PGH Family Medicine Clinic from April-June 2007, diagnosed with hypercholesterolemia. Fifteen (15) patients were assigned to the treatment group, the other 15 patients to the control group. For one month, patients in the treatment group were advised to take three teaspoons of soybean powdered drink mixed in I glass (375 ml) of water once a day along with one Simvastatin 40 mg tablet at bedtime, while patients in the control group were advised to take one Simvastatin 40 mg tablet at bedtime alone. All patients were followed-up after 1 month at the Family Medicine Clinic to obtain repeat history, physical examination and blood determination to measure total cholesterol levels. Results: There are three statistically significant factors: palatability (p=0.000), cost (p=0.000) and effectiveness (p=0.000) which affect patients' compliance to dietary supplements. The intergroup comparison using paired T-test showed a decrease in mean total cholesterol levels of both the treatment (p=0.364) and control (p=0.235) groups, but was not statistically significant (p=0.05). The intragroup comparison using paired T -test showed a decrease in mean total cholesterol levels in both treatment (p=0.000) and control (p=0.001) groups and was noted to be statistically significant. Conclusion: The use of lipid lowering agents alone is still more effective than using dietary supplements such as soybean powdered drink as supplement to lipid lowering agents in decreasing total cholesterol levels of patients diagnosed with hypercholesterolemia. (Author's abstract)

Keywords: Medicine, Lipid, Hypercholesterolemia, Cholesterol, Soybean powdered drink

The Filipino Family Physician, Volume No. 46 Issue No. 4, 189-194 (Filipiniana Analytics) Fil(S) R97.4 F2 46/4 2008

0466

The effectiveness of thinber on weight reduction as an adjunct to low calorie diet prescription among adults: a randomized controlled study *Lazaro, Carla Frances M.* 

Obesity is a predisposing factor in the development of heart and vascular diseases. Its prevalence among Filipinos is increasing these last few years. Studies support that dietary fiber intake prevents obesity. A number of fiber supplements are being sold in the market and one of them is Thinber. **Objective:** The study aimed to verify if the addition of Thinber to low calorie. diet prescription could result to a significant weight loss. Method: This is an open labeled randomized controlled trial involving 59 patients who were randomized into control arm (individualized low calorie diet only) (n = 30) and treatment arm (low calorie diet prescription and intake of Thinber) (n = 29). The participant's weight and BMI were monitored weekly for 4 weeks and then after 2 months. **Results:** In this study, it was noted that the mean weight significantly decreased after low calorie diet prescription for both treatment and control groups both after 4 weeks (p<0.01) and after 2 months (p<0.01). For the control group, the mean weight for the baseline, 4 weeks after and 2 months after were as follows ( $70.86 \pm 14.91$ ), ( $69.48 \pm 14.91$ ) 13.21), (69.12  $\pm$  12.67). For the treatment group, the mean weight baseline, 4 weeks after and 2 months after were as follows:  $(67.51 \pm 9.53)$ ,  $(66.50 \pm 9.65)$ ,  $(65.96 \pm 3.39)$ . Correspondingly, there was also a note of decrease in BMI for both treatment and control groups after 4 weeks (p<0.01) and 2 months (p<0.01). For the control group, the mean BMI for the baseline, 4 weeks after and 2 months after were as follows;  $(29.25 \pm 4.19)$ ,  $(28.70 \pm 3.63)$ ,  $(28.56 \pm 3.43)$ . For the treatment group, the mean BMI for the baseline, 4 weeks after and 2 months after weight were as follows :

 $(27.88 \pm 3.56)$ ,  $(27.45 \pm 3.57)$ ,  $(27.23 \pm 3.43)$ . However, there was no statistically significant difference in the and change added weight BMI if Thinber was to the low calorie diet prescription as was done in the treatment group. Conclusion: Low calorie diet prescription is an integral and effective method of getting overweight and obese patients to lose weight. Further studies would have to be done to determine the effectiveness of adding Thinber to a diet program. (Author's abstract)

Keywords: Medicine, Low calorie diet, Weight reduction, Thinber, Dietary fiber intake

The Filipino Family Physician, Volume No. 45 Issue No. 4, 149-158 (Filipiniana Analytics) Fil(S) R97.4 F2 45/4 2007

## Evaluation and in-house validation of five DNA extraction methods for PCR-based STR analysis of bloodstained denims

#### Co Seng, Kristine L., Calacal, Gayvelline C., Perdigon, Henry B., Halos, Saturnina C., De Ungria, Maria Corazon A.

One type of crime scene evidence commonly submitted for analysis is bloodstain on denim. However, chemicals (e.g., indigo) used to produce denim materials may co-purify with DNA and hence, affect subsequent DNA analysis. The present study compared five methods (e.g., standard organic, organic with hydrogen peroxide  $(H_2O_2)$ , modified FTAâ,,¢, organic/Chelex®-Centricon®, and QIAamp® DNA Mini Kit-based procedures) for the isolation of blood DNA from denim. A Short Tandem Repeat (STR)-based analysis across two to nine STR markers, namely, HUMvWA, HUMTH01, D8S306, HUMFES/FPS, HUMDHFRP2, HUMF13A01, HUMFGA, HUMTPOX, and HUMCSF1PO, was used to evaluate successful amplification of blood DNA extracted from light indigo, dark indigo, indigo-sulfur, pure indigo, sulfur-top, and sulfur-bottom denim materials. The results of the present study support the utility organic/ of Chelex®-Centricon® and QIAamp® Kit procedures in extracting PCR-amplifiable DNA from five different types of denim materials for STR analysis. Furthermore, a solid-based method using FTAâ,,¢ classic cards was modified to provide a simple, rapid, safe, and cost-effective procedure for extracting blood DNA from light, dark indigo and pure indigo denim materials. However, DNA eluted from bloodstained sulfurdyed denims (e.g., sulfur-top and sulfur-bottom) using FTAâ,,¢ procedure was not readily amplifiable. (Author's abstract)

**Keywords:** Medicine, DNA extraction, Bloodstained denims, PCR, Short tandem repeat, FTA  $\hat{a}_{,,} \phi$  classic card, Inhibitors

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 1, 37-48 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/1 2004

0468

### A family health care model for the implementation of mass annual treatment with diethylcarbamazine citrate for the elimination of filariasis in the Philippines

Malicdem, Criselda, Centar for Health Development, Southern Tagalog, Provincial Health Office, Mindoro Oriental, Malaria Control Team, Mindoro Oriental, Municipal Health Office, Saco, Mindoro Oriental, Barangay Health Officials in Sayanan & Mangangan, Family Clusters in Brgys. Sayanan & Man

The principal aim of the study was to install a model to be employed in the Mass Treatment using the combination drugs, Diethylcarbamazine Citrate and Albendazole for the control and elimination of filariasis in the villages occupied mostly by Mangyans in the Municipality of Baco, Mindoro Oriental. A collaborative approach with community members focused on families was used to install the model,

The findings of the study showed that moving towards developing a community-managed filariasis elimination program, family empowerment facilitated the program s implementation which was done through the Family Health Care Model with its five components, namely, 1.) Development of Municipal Filariasis Elimination Committee, 2.) Creation of family clusters, 3.) Information & education, 4.) Training of health workers and families on NFEP, and 5.) Conduct of mass treatment scheme thru the "Filaria Health Fair". This study will be of interest to policy makers involved in health. (Author's summary)

Keywords: Diethylcarbamazine citrate, Medicine, Filariasis, Albendazole

Philippine Health Systems Research: a scientific publication of DOH-funded researches 2000-2001, Volume No. 1 Issue No. , 71-105 (Filipiniana Analytics) Fil(S) RA440.85 P543 2001

#### Genetic methods for area-wide management of lepidopterous pests with emphasis on F<sub>1</sub> sterility Ocampo, Virginia R.

Enormous losses in the production and marketing of food and fiber are caused by larvae of Lepidoptera. Currently, Large quantities of insecticides are used to combat these pests. Insecticide resistance, increasing concern over pesticide pollution, and the desire to effectively manage lepidopteran pests on an area-wide basis have motivated scientists to identify and develop new pest management tactics that are compatible with current IPM. Genetic methods have emerged as a promising control strategy for lepidopteran pests. Genetic control as a practical means of pest management was first successfully implemented by knipling and colleagues in the USA during the 1960's with the sterile insect technique (SIT) program for the screwworm fly. SIT is not as readily adapted for use against Lepidoptera as against Diptera. Radiation-induced inherited sterility (or  $F_1$  sterility) is generally considered the most promising genetic methods for large-scale suppression of lepidopteran populations. This paper discusses four generic control methods that have been developed and the progress that has been made in integrating sterility with other IPM tactics. (Author's abstract)

Keywords: Medicine, Lepidoptera, Radiation-induced inherited sterility, IPM

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No., 137 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

0470

#### Genetic polymorphism of CYP2D6\*10 gene among Filipinos

Baclig, Michael O., Predicala, Rey Z., Mapua, Cynthia A., Daroy, Maria Luisa G., Tiamson, Ma. Elena B., Palabrica, Maria Luisa D., Atillo, Roy P., Torres, Ronald Allan R., Tobias, Sheryl S., Javier, Francis O., Natividad, Filipinas F.

Cytochrome P450 9CYP2D6) is one of the major drug metabolizing enzymes involved in the biotransformation of many clinically important medications including opioid analgesics. CYP2D6 enzyme activity varies considerably within a population. Particularly, CYP2D6\*10 allele is more common among Oriental than among Caucasians. A recent study among Chinese individuals showed that the allele frequency of CYP2D6\*10 (C188T) was about 37-70%. Phenotypic expressions include individuals with ultrarapid, extensive, intermediate, and poor metabolizer status. It has been shown that the various phenotypes have profound effects on the efficacy of drugs as well as its adverse

In this study, we determined the allele and genotype frequencies of CYP2D6\*10 among Filipinos using PCR-RFLP and sequence analysis. Blood samples were obtained from healthy study participants and patients with chronic pain, with diagnosed cancer pathology stages 1 to 4.

The calculated allele frequencies in Hardy Weinberg equilibrium were 0.49 and 0.51 for the CYP2D6\*10 dominant and recessive alleles, respectively. Out of the seventy seven samples, 18 (23%) were identified as homozygous for the wild type, 40 (52%) were identified as heterozygous, and 19 (25%) were identified as homozygous for the mutant allele. Our results showed that majority of the Filipinos were heterozygous for the intermediate allele (52%).

PCR-RFLP and sequence analysis provides a useful tool for CYP2D6\*10 genotyping. The allele frequency of CYP2D6\*10 was comparable with other Asian populations. Individuals heterozygous for the intermediate allele were found to be the predominant genotype among Filipinos. (Author's abstract)

Keywords: Medicine, Allele frequency, CYP2D6\*10, PCR-RFLP, Polymorphisms, Sequencing

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 202 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

## Growth patterns and infectivity of a dengue-2 virus strain propagated in the human myelomomocytic cell line K562

#### Buerano, Corazon C., Morita, Kouichi, Hasebe, Futoshi, Inoue, Shingo, Matias, Ronald R., Natividad, Filipinas F., Igarashi, Akira

Dengue virus is the causative agent of the disease dengue, which is manifested in different degrees of severity. There are 4 serotypes of the virus namely, Dengue 1, 2, 3 and 4. The genomic nucleotide sequences of representative strains of all 4 serotypes have been determined. Recently, Mangada and Igarashi (1998) reported the sequencing of the entire genome of three Dengue 2 virus strains from Thailand. These are ThNH-pll/93, ThNH-28/93 and ThNH 7/9, which were isolated form Thai patients exhibiting dengue fever, dengue haemorrhagic fever, and dengue shock syndrome, respectively. Differences in the secondary structure in the 3 non-coding region, as well as significant amino acid replacements, which could potentially alter the nature of the viral proteins, have been noted. In the present study, the growth patterns and infectivities of these three virus strains were compared. The viruses were initially propagated in the mosquito cell line, C6/36 Aedes albopictus, maintained in Eagle's minimal essential medium containing 2% fetal calf serum (FCS) and incubated at 28°C. After I week, the infected culture fluids (ICF) were collected and pre-incubated with or without enhancing antibodies. These 2 types of ICFs were then inoculated at the same multiplicity of infection into K562 human myelomonocytic cells. After two hours of viral adsorption, cells were cultured in 24-well plates at a concentration of 2 x  $10^5$  cells/ml per well in 2% FCS-supplemented RPMI at 37°C in a CO<sub>2</sub> incubator. Cells were harvested everyday for 7 days. Virus growth was quantified by focus formation unit assay in BHK Percent of infected K562 cells was detected through immunoflourescence test and correlated with severity of disease. (Author's abstract)

**Keywords:** Medicine, Dengue virus, Dengue fever, Haemorrhagic fever, Dengue shock syndrome, Ades albopictus, Enhancing antibodies, Myelomonocytic cell, K562 cells, Immunofluorescence assay test, Dengue-2 viruses

Transactions of the National Academy of Science and Technology, Volume No. Issue No., 310-311 (Filipiniana Analytics) Fil(S) Q149.P5 N25 v.22 2000

### Histomorphometry and osteoinductive growth factor levels of fracture callus versus iliac crest bone grafts

#### Gaston, Czar Louie, Bascos, Neil Andrew, Kalim, Serjohn, Vergel de Dios, Ariel, Dela Rosa, Tammy

Autologous iliac crest bone grafting (ICBO) has been the standard bone graft for fusion and nonunions. Alternatives have been sought to address the limited quantity available and avoid the morbidities of the harvesting procedure. Fracture callus has proven osteoinductive properties but is not an advocated bone graft substitute due to its

unquantified osteoinductive properties. Our study aimed to determine the histomorphology and levels of osteoinductive growth factor levels of fracture callus versus ICBG. Ten patients with long bone fractures undergoing open reduction, fracture fixation, and iliac crest bone grafting were recruited. Samples of fracture callus and ICBG from each patient were sent for histomorphologic analysis and determination of levels of the following cytokines: BMP-2, IGF-1, and TGF-B by RT-PCR. Paired t-test was used to determine any significant difference between callus and bone grafts. Preliminary results showed comparable numbers of osteoblasts and osteocytes for fracture callus and ICBG. Both contained areas of woven bone. PCR· products were successfully amplified using primers for BMP and IGF. Comparable levels of BMP and IGF were found in callus and ICBG. Upon stratification, more BMP was expressed in callus than ICBG in callus <10 weeks of age. Our study demonstrates the presence in callus of cells and growth factors essential in bone formation, in quantities comparable to iliac crest bone graft, especially in callus from fractures less than 12 weeks old. This sets the stage for future animal and clinical trials to determine the viability of callus as a bone graft substitute. (Author's abstract)

Keywords: Medicine, Bone graft substitute, Histomorphometry, RT-PCR, Gene expression, Growth factors

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 155-156 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

### Hormonal contraception: an approach to the demographic crisis in the Philippines *Negre-Pareja, Mildred C.*

This paper aimed (1) to analyze the acceptance of hormonal contraceptives and the performance of women-users in the Philippines; (2) to discuss the development of the hormonal contraceptives; (3) to discuss recent evidence about health benefits and risks and issues in oral contraceptive use; (4) to discuss new benefits and new drugs; (5) to discuss hormonal contraceptive for the male. The hormonal contraceptive methods in the form of oral contraceptive pill and injectables eniov the first choice of Filipino women who use contraceptive methods. It was found that discontinuation rates are due to side-effects and health concerns. The method failure for the hormonal contraceptive methods is 5.4 % on the first year. The prospect of immediate future use is higher than the other methods. (Author's abstract)

Keywords: Hormonal contraceptives, Medicine, Injectables, Reproductive control methods

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 13 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

0474

#### Hypertensive patients' symptoms distress and quality of life

#### Jondonero, Clowe, Demayo, Cesar G., Torres, Mark Anthony J., Madarang, Maricar Mae C., Ramiro, Katherine M.

Patients with hypertension frequently report symptoms that are similar to those reported by patients without the diagnosis. Although hypertension is often thought to be asymptomatic, cognitive changes, mood alterations, and general symptoms such as dizziness and headaches have been described. Health-related quality of life (HRQOL) may be influenced by these symptoms, whether these are derived from disease or treatment. This study was conducted to know the HRQOL, specifically the physical, emotional, and social impact of hypertension.

A structured questionnaire was used to determine the health, wellness, and quality of life of hypertensive patients recruited to participate in this study. The questionnaire has six areas of concern: physical state, emotional/mental state, stress evaluation, life enjoyment, overall quality of life, and overall impressions of their quality of life.

Results show that the majority of patients diagnosed with hypertension occasionally or rarely experience physical pain, occasionally or constantly experience emotional/mental distress, moderately suffer from stresses in life, enjoy life considerably, are pleased with their overall quality of life, and have an overall impression that the quality of their lives are the same even before the diagnosis of the disease. They however anticipate that things may change if nothing will be done about their condition; their quality of life may change by then. (Author's abstract)

Keywords: Medicine, Hypertension, Symptom distress, Quality of life

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 162 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

#### Impact of internet use on medical practice of FM residents and consultants in Davao City Endrina, Elizabeth B.

Purpose: The aim of the study was to examine the extent and impact of Internet use on medical practice among family practitioners in Davao City. Specifically, it aims to determine the percentage of Family Medicine consultants and residents of Davao City who are using internet in their practice, their Internet practices (frequency, choice of website, etc.), factors that influence or hinder them from using the internet. Method: A random sample of consultants and residents of Family Medicine in Davao City was surveyed to determine the extent of Internet use on familv medical practice among practitioners in Davao City. They completed a 13-item questionnaire. The SPSS software was used for data analysis. Results: The mean age of the respondents was 34 years. A II respondents had used the internet. Google (78%) was the most popular sea rch engine used to access the different medical or clinical information or other medical sites. The databases most searched include Journals (65%) and Medline (55%). Most of them accessed information on how to update management skills (68.7%) which is the leading type of in formation sought on the internet. Multiple barriers to increased use of internet were identified including time constraints, s low internet connections, and costs. There were 76 percent of them who had a better understanding of the symptoms, cond itions, or treatment of certain disease. Seventy two percent of them had an improved ability to manage health care needs of their patients. use of the internet for health information for Conclusion: Physicians' patient care was widespread but the use of the evidence-based medicine resources like Cochrane library, Clinical Guideline Site, etc was minimal. (Author's abstract)

Keywords: Medicine, Internet, Evidence-based medicine, FM residents

The Filipino Family Physician, Volume No. 46 Issue No. 3, 152-161 (Filipiniana Analytics) Fil(S) R97.4 F2 46/3 2008

0476

#### Impacts of a patient's death under a health provider's care

Jondonero, Clowe, Demayo, Cesar G., Torres, Mark Anthony J., Naelga, Jacklyn G., Renegado, Jessica G.

When someone dies, the impact of the death on his/her family and friends are often thought about. What about the impacts on those who were caring for the patient? As health care providers are often expected to put on a brave front in public when a patient dies, it was the goal of this study to determine the effects of a patient's death on a health care provider. Data were gathered from three hospitals: 2 base hospitals of MSU-IIT Department of Nursing (Don Gregorio T. Lluch Memorial Hospital and Dr. Uy Hospital) and 1 private hospital (Mindanao Sanitarium and Hospital). The respondents were registered nurses, student nurses, and medical assistants who had experienced death and dying of patients under their care. They were recruited after having asked permission from the chief of the hospital chief nurse. Structured questionnaires or the were used.

The results showed that health care professionals, especially new and

death student nurses, grieved over the of patients. Sadness, guilt, helplessness, shock, and depression were the most frequently cited reactions experienced by a health care provider over the loss of his/her patient. These emotions show that health care providers go through a uniquely human grieving process. It was however observed that as the length of experience and number of patient deaths under the health provider's care increase, grieving and depression are reduced. Health care providers usually suppress their emotions so that their efficiency and competence in work do not get affected. While a patient's death may create a general change in attitude and perceptions of the health care provider towards their work, the study revealed that health care providers do not allow their emotions to affect their ability to provide competent health care. This indicates a high degree of professionalism among the respondents.

The results of the study highlight the need to include death education courses in the nursing program. These courses must become an integral part of the nursing general knowledge curriculum before nurses take their clinical practice courses. In the clinical practice setting, there is a need for the more experienced nurses to discuss death experiences and perceptions among the health care providers to help the student nurses cope with their grief and depression over the deaths of patients under their care. Understanding the nature of death and dying will help the health care provider cope when faced by the dying and death of the patient. (Author's abstract)

Keywords: Medicine, Death, Health care provider, Impacts

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 163-164 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0477

#### Improving human fetal development: the super baby Agbayani, Sr., Beni

Given the genetic background of both parents (mediocre or outstanding), and the environmental influence (inside and outside) the mother's womb, these factors have a great deal of shaping the embryonic and fetal development. It has been demonstrated that purposeful modification enrichment of the brain using sound stimulation (baby plus), other favorable means (Classical music) can modify outcome resulting and the in a healthier baby.

The idea of modifying the development of the fetus while in the womb of the mother has raised some eyebrows, because many believed that it is development in the womb should allow nature to play its normal course, and not to interfere with it. There must be some wisdom in this belief except that whether we like it or not, there are many environmental or external forces as well as maternal influences that shape the baby's well being even before birth. They are mostly unpredictable and some can be even harmful for the developing fetus.

Though no fault of the child or the mother, air and noise pollution is a real threat to the fetal environment. Even the lowly 2-stroke tricycle that commutes in subdivisions and also in the rural nooks and corner, they are inevitable noxious environmental concerns affecting the fetus in its development inside the womb. Inside their homes, it is quite possible that the mother and the father also smokes, contributing passively nicotine and other cigarette pollutants affecting fetal development inside the womb. Furthermore, the mother can create an unfavorable environment not suitable for the optimum fetal development when embroiled with family quarrels or emotional outbursts and violence releasing hormones that affect the fetal development. Many harmful maternal factors provide a nidus for fetal underdevelopment such as mother's under nutrition or malnutrition. Not to mention the mother's resentment towards an unwanted pregnancy - like worrying about the outcome of an abnormal baby. Add further the consequences of harmful drug intake arising from much needed medications during the crucial formative months causing possible congenital defects or malformation? Can we therefore, modify the environment to avoid these harmful events in the environment of the fetus to happen by creating instead more pleasant experiences and

stimulation for both mother and the	baby?
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The discovery of stimulating the fetus is part and parcel of the continuing development of the child, which has been recently observed favorably by a number of pediatricians and by their mothers. There are many advantages of starting the infants' preparation to the outside world early, as soon as full organs were morphologically developed in the womb. There are indeed many evidences and favorable testimonies that the baby can develop full potential ahead, to a pleasantly happier and healthier baby. A fetus nurtured with gentle stimulation and provided with pleasant physical and emotional environment including simulated heart beat (Baby plus) placed on -the mother's abdomen, and/or classical music of Vivaldi, Bach and Mozart played periodically show a much superior child that an unplanned pregnancy in terms of physical and emotional development. And not a monster as most feared but a super baby instead, so to speak. (Author's abstract)

Keywords: Malnutrition, Medicine, Fetus, Embryonic development, Fetal development, Enrichment of the brain

#### In vitro study on the bactericidal effects of freshly prepared colloidal silver Fontanilla, Ma. Regina C., Siao, Winnie P., Lisondra-Krings, Catherine

**Objective:** To determine the bactericidal properties of colloidal silver. **Methodology:** This is an experimental study using an open experimental trial method. Different concentrations of freshly prepared colloidal silver (5 ppm, 10 ppm, 20 ppm and 40 ppm) were inoculated in 7 petri dishes containing culture medium of *Staphylococcus aureus* and were incubated at 35 °C for 24 hours . The diameters of the zones of inhibition were measured in mm. The means of the zones of inhibition of the different concentrations of the colloidal silver were compared to a positive (Cloxacillin) and negative (sterile water) controls. **Results:** Results of the one-sample t-test show that the positive control (Cloxacillin) had a bigger diameter compared to colloidal silver at all concentrations (5 ppm, 10 ppm, 20 ppm and 40 ppm) with a p value < 0.05 . Results of the one-sample t-test show that at all concentrations (5 ppm, 10 ppm, 20 ppm and 40 ppm) of colloidal silver had a bigger diameter compared to the negative control (sterile water) with a p value of < 0.05. **Conclusions:** Colloidal silver demonstrated better in vitro bactericidal activity on all concentrations (5 ppm, 10 ppm, 20 ppm and 40 ppm) for *Staphylococcus* compared to the negative control (sterile water) but not as efficacious as Cloxacillin. (**Author's abstract**)

Keywords: Medicine, In vitro, Colloidal silver, Staphylococcus aureus, Cloxacillin

The Filipino Family Physician, Volume No. 45 Issue No. 3, 108-114 (Filipiniana Analytics) Fil(S) R97.4 F2 45/3 2007

0479

### Interleukin 4 -590 C/T gene polymorphism as a genetic marker for atopic asthma in a selected Filipino pediatric population

Ramos, John Donnie A., Cabus, Charles Erwin A., Ibarra, Jhoana Kim B., Manalo, Christopher G., Matibag, Jela Patricia R.

The Journal of the Philippine Medical Association, Volume No. Centennial issue Issue No. , 57-66 (Filipiniana Analytics) Fil(S) R97.5 P57 2004

Allergic asthma is the most common chronic disease in childhood worldwide, characterized by airway inflammation associated with hypersensitivity and is brought about by the interaction of well-recognized environmental and largely uncharacterized genetic factors. Interleukin-4 (IL-4) cytokine modulates the pathogenesis of atopy, immunoglobulin-E (IgE) secretion, and allergic inflammatory response. The IL-4 cytokine is regulated by the IL-4 gene located in human chromosome 5q31-33. This study aimed to determine the association of -590 C/T IL-4 gene polymorphism and the risk of atopic asthma in a selected Filipino pediatric population. Fifty one gender- and age-matched pairs of allergic and nonallergic individuals were phenotyped for total serum IgE using enzymelinked immunosorbent assay (ELISA). Atopic status was defined by serum IgE concentration  $\geq$ 100 IU/mL. DNA was extracted from peripheral blood and genotyped for the -590 C/T polymorphism by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) analysis with Ava II endonuclease. The study population conformed to the HardyWeinberg Equilibrium proportion  $(\chi^2 p > 0.05)$  based on the gathered genotype frequencies. An association between the -590 C/T IL-4 polymorphism and IgE levels was confirmed in the study population (ANOVA p=0.0157). The IL-4 T allele frequency was significantly higher in allergic (0.392) than in non-allergic (0.235) subjects (OR=2.10, 95% CI=1.144-3.844,  $\chi^2 p=0.0232$ ) was also established. Thus, the -590 C/T IL-4 gene polymorphism is a risk factor to Filipino pediatric atopic asthma. The -590 C/T IL-4 gene polymorphism can be used as a genetic marker for the diagnosis of allergic asthma among Filipinos. (Author's abstract)

Keywords: Medicine, Interleukin 4, Single nucleotide polymorphism, Allergy, Atopic, Asthma

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0480

#### International scientific productivity of selected universities in the Philippines Valencia, Marshall N.

This paper presents a survey of the productivity, in terms of international scientific publications, of 465 PhDs in the science and engineering colleges of selected research universities in the Philippines. It covers the period 1998-2002. Publication counts are based on research articles listed in the Science Citation Index of the Institute for Scientific Information (ISI). Results indicate that the average productivity of the faculty surveyed is less than one (1) international publication in five years. Only of the academic (5)one units included in the survey was able to achieve the world-class benchmark for research excellence, which is at least one international publication per faculty member per year. (Author's abstract)

Keywords: Medicine, International scientific publications, Scientific productivity, ISI

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 1, 49-54 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/1 2004

#### Irradiated long bone transplants in limb saving surgeries for extremity bone cancers Wang, Edward HM

In the Philippines, the treatment of cancers of the limbs has. always been by amputation. In recent decades, better understanding of these cancers and advances in the disciplines of cancer medicine have made the saving of these limbs almost routine in better developed countries. Surgeries entail two steps: (1) excision of the tumor and the bone from which the tumor arose, followed by (2) reconstruction of the defect resulting from the excision. Since these defects are usually extensive, reconstruction is not possible with methods ordinarily available to orthopedic surgeons.

Different options for defect reconstruction are possible, including metallic tumor implants, microvascular surgery, and bone cement. Tumor implants, however, are not available locally, and are too costly for the average Filipino patient. Microvascular surgery is litnited by the size of the defect it can bridge; and bone cement, not being biologic, can result in greater long term problems.

Recently, the option of long bone transplants (aka large-segment allografts) to reconstruct these defects has<br/>become available locally. These bones are<br/>harvested from both cadaveric and live amputee donors after appropriate consent and medical work-up. After<br/>processing at the UP-PGH Tissue and Bone Bank, the bones are sterilized by irradiation at the PNRI, and stored in<br/>deep freezers until use.

In the Philippines, limb saving surgery for bone cancers of the extremities using these large-segment allografts was introduced in 1993 at the UP-PGH Musculoskeletal Tumor Unit. This paper will present the author's initial 3-year experience with 19 patients whose limbs were saved using bones transplantation.

All surgeries were performed by the author and all patients have been personally followed up by the author (follow-up ranging from 6 months to 3-1/2 years).

Cases will be presented to show the pre- and intraoperative processing of the irradiated bone; and the patients before and after the operations with emphasis on their improved quality of life and return to function. These results would seem to show that irradiated long bone transplants coupled with skills for limb saving surgery may make amputations a thing of the past for many of our unfortunate countrymen afflicted with cancers of the arms and legs. (Author's abstract)

Keywords: Medicine, Allografts, Irradiation, Metallic tumor implants, Microvascular surgery, Bone cement

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No., 176 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

#### 0482

### Isolation and identification of constituents from the antitubercular DCM fraction from the leaf extract *Premna odorata* blanco

#### Lirio, Stephen B., Macabeo, Allan Patrick G., Franzblau, Scott G., Wang, Yuehong, Aguinaldo, Ma. Alicia M.

In recent years, the resurgence of multi- and extensively-drug resistant strains has prompted the need to develop safe drugs as quickly and efficiently as possible. In a previous study, the dichloromethane sub-extract (PoMD) obtained from the leaf extract of the Philippine medicinal plant *Premna odorata* Blanco was found to be active against *Mycobacterium tuberculosis*  $H_{37}Rv$ , exhibiting 99% inhibition at 128 µg/mL and 64 µg/mL concentrations. This study aims to purify the dichloromethane sub-extract and identify the constituents present therein. The PoMD extract was subjected to vacuum liquid chromatography (VLC) with gradient elution using hexane/dichloromethane and dichloromethane/methanol. Thin layer chromatographic monitoring resulted in 20 pooled fractions which were bioassayed using Microplate Alamar Blue Assay (MABA). The fractions PoMD.4,5,7,8,9 and 15 were found to be active, having a minimum inhibitory concnetration (MIC) of 53.87, 119.71, 117.12, 113.12, 82.80 and 108.91

 $\mu$ g/ml, respectively. The high yielding PoMD.8 was further subjected to VLC as above and gave 7 pooled fractions. PoMD.8.2 and PoMD.8.4 were further purified by column chromatography with isocratic elution using hexane to obtain PoMD.8.2.1 and PoMD.8.4.1 as white flakes. Both isolates were characterized by spectroscopic methods and were found to be a mixture of  $\beta$ -sitosterol and stigmasterol. Purofication of the other fractions is ongoing. (Author's **abstract**)

Keywords: Medicine, Premna odorata Blanco, Mycobacterium tuberculosis H---37Rv, Tuberculosis, Philippine Medicinal Plant, Steroids

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 201 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0483

#### Mechanical, chemical and surgical methods of contraception Oblepias, Virgilio R.

There are several methods of contraception. They may be classified as natural or artificial, temporary or permanent. The natural and temporary methods are the Cervical Mucus, Calendar Rhythm, Basal Body Temperature (BBT), Sympto-Thermal and the Lactational Amenorrhea (LAM). All these are considered periodic abstinence except the Lactational Amenorrhea Method (LAM). The artificial and temporary methods are the Barriers - both mechanical (condom and diaphragm) and chemical (spermicides), Hormonal (Pills, injectables and implants) and the Intrauterine Contraceptive Devices (IUCD). The permanent methods are surgical sterilization procedures such as bilateral tubal ligation for women and vasectomy for men. This paper focuses its discussion on the Mechanical, Chemical and Surgical methods, and the Intrauterine Contraceptive Devices. (Author's abstract)

Keywords: Medicine, Methods of contraception, Mechanical, Chemical, Surgical

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 12 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

0484

## Mechanism of H<sub>2</sub>S absorption using calcium-based sorbents under in-situ coal gasification conditions

#### Bawagan, Apollo Victor, Takeda, Shohei, Katalambula, Hassan

The removal of hydrogen sulfide  $(H_2S)$  using natural calcium-based sorbents such as limestone, scallop shell and dolomite was studied under coal gasification conditions. The experimental conditions were simulated according to the conditions typical in a coal gasification system using a tubular quartz reactor under atmospheric

pressure. The sorbents used in these experiments were Philippine limestone, Philippine dolomite and scallop shell. Based on previous studies (Kaewwichien,1998). the particle sizes used for limestone and dolomite was 106 - 180  $\mu$ m while for scallop shell was 105 - 210  $\mu$ m. The sorbents were mixed with coal char and then converted into ash by heating in a muffle furnace before the samples are introduced into the reactor. The coal chars used were Blair Athol, Taiheiyo, Ermelo and Datong. The conditions for the desulfurization experiments were set at a reaction temperature of 900°C with the total flow rate and  $H_2S$  concentration maintained at 500 ml/min and 1700 ppm respectively. It was found out that when  $H_2$  was passed through the reactor. a reaction between  $H_2$  and the sulfur in the ash occurred thereby releasing the sulfur to form  $H_2S$  which is called the initial ash sulfur release (IASR). The IASR for the different types of ashes were determined under two cases. namely, by the passing of  $N_2 + H_2$  and by the  $N_2 + H_2 + H_2S$  case and it was found out that the IASR was higher for ashes with a higher sulfur content. In the  $N_2 + H_2$  case. the  $H_2S$  decreased to zero while for the  $N_2 + H_2$ ,  $+ H_2S$  case, the same happened and then the  $H_2S$  started to increase again as  $H_2S$  was being absorbed by the ash. In the ashes mixed-with sorbents, the IASR was determined for the  $N_2 + H_2 + H_2S$  case and it was found that the IASR for ashes with sorbents was slightly higher than the ashes only. Also, the IASR of the limestone-ash mixture was higher than that of the scallop shell-ash and dolomite-ash mixtures. The iron (Fe) attachment to the lime was found to be more of a chemical reaction due to the formation of other Fe compounds while the Fe attachment to the scallop shell was only physical reaction since Fe was just adhering to the surface of the sorbent. The absorption abilities were also determined for both ashes only and sorbents in the sorbent-ash mixtures. The absorption ability of sorbents in the Blair Athol-sorbent mixture had the lowest values compared to the other sorbent-ash mixtures. The limestone had the highest absorption ability compared to the other sorbents. (Author's abstract)

Keywords: Medicine, Hydrogen sulfide, Limestone, Scallop shell, Dolomite

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 24 Issue No. 2, 71-91 (Filipiniana Analytics) Fil(S) T1 N21 24/2 1999

0485

#### Modified caregiver strain index Guison-Bautista, Ma Teresa Tricia, Yu-Maglonzo, Eva Irene, Pilares-Cruz, Ma. Victoria

**Objective:** This study aims to assess the validity and reliability of the Modified Caregiver Strain Index (MCSI) to detect strain among caregivers of chronically and terminally-ill patients admitted at the UST hospital. Patterned after Robinson's Validation of the Caregiver Strain Index (1983), this study was devised in order to come up with a brief, easily administered tool written in the vernacular to identify strain resulting from caring for all types of chronically and terminally ill patients. **Methods:** The MCSI used 156 caregivers, 18-79 years old, who provided varying degrees of care to patients. Face and construct validity of the 11- item MCSI were ascertained. Evidence of concurrent validity between MCSI scores using Pearson's correlation was obtained in three areas: caregivers' perception of the caretaking relationship, physical and emotional health of the caregiver and nature of care partnership. Cronbach's reliability coefficient was 0.86. **Conclusion:** The validity and reliability results indicate that the MCSI may be useful in screening strain among Filipino caregivers of chronically and terminally ill patients. This tool may provide clues to the health care professional as to the needs of the caregivers and tailor interventions to address them. **(Author's abstract)** 

Keywords: Medicine, Caregiver, Caregiver strain, Validity, Reliability, Reliability index

The Filipino Family Physician, Volume No. 45 Issue No. 1, 1-7 (Filipiniana Analytics) Fil(S) R97.4 F2 45/1 2007

#### Modified fall risk assessment tool among elderly diagnosed with chronic disease Aceret, Antonieta A.

**Objective:** To determine the association of risk factor to fall and to determine fall-related injuries among elderly patients. **Setting:** Out patient department, YMMC. **Methods:** A total of 432 veterans, their dependents and employees aged 60 and above, diagnosed with chronic disease were asked to answer the MFRAT questionnaire, perform time up and go test and undergo a mental status examination . The data were gathered and tallied using Microsoft Excel and statistical data analysis. **Results:** There were 262 females (60.65%) and 170 (39.95%) males, whose ages ranged from 60-94 years old. Majority were between 68-82 years old (x=75, SD=7.42). Two hundred fifty four of the respondents had history of fall (58.8%). Most of the elderlies were hypertensive. Antihypertensive drug, cardiovascular system drug, antidiabetic drug, analgesic and antiprostate cancer drug were the most common medications taken by the elderly. There was a strong linear association between the number of drugs that elderly took and the occurance of a fall . Among the risk factors , medication, vision, unsafe environmental hazard, and difficulty in mobility were significantly associated with fall. It was also noted that age, gender and chronic disease w.ere associated with fall. In this study, the odds of falling increased as the risk factor increased . Soft tissue contusion is considered as the most (85.03%) common fall-related injury. **Conclusion:** Medication, vision , environmental hazard and balance showed a positive association with fall. MFRAT is a fall risk assessment tool used to identify patients at risk for falling that can be used in a health care facility. **(Author's abstract)** 

Keywords: Medicine, Modified fall risk assessment tool, Chronic disease, MFRAT

The Filipino Family Physician, Volume No. 46 Issue No. 3, 170-178 (Filipiniana Analytics) Fil(S) R97.4 F2 46/3 2008

0487

#### Morbidity changes among smoking clients who consulted at Eastern Visayas Regional Medical Center Family Health Clinic from October 2003 - October 2004 *Labastos-Ruetas, Lory D.*

Smoking is a health hazard associated with increased risk of developing health problems. This health menace has now reached epidemic proportion yet it is supposed to be a preventable problem. **Objective:** The general objective of the study was to determine the morbidity changes among clients who consulted at EVRMC FM clinic. **Method:** This study is descriptive. The population consists of smoking clients at EVRMC FM clinic who had a history of smoking and who sought medical consultation for an illness from October 2003 to October 2004. Research questionnaire was used as the investigative tool in this study. **Results :** Thirty subjects were included in this study with majority coming from age group, 25-34. There were more males than females, most of them were married, elementary graduates and are mostly farmers. Majority of the subjects smoke because of the influence from other people. Clients smoke 11-30 sticks per day and most have been smoking for 11-20 years already. Pulmonary illnesses were the most common problems encountered by the smokers in the study. **Conclusion:** Sociodemographic factors are relevant to the smoker's smoking habit. The greater number of cigarettes smoked and the longer the duration of smoking will determine the occurrence of morbidity changes among smokers. (**Author's abstract**)

Keywords: Medicine, Smoking, Morbidity, Pulmonary illness

#### Multidrug-resistant esbls in common clinical isolates: first documentation of BLACTX-M genotype in the Philippines *Clado, Jeniffer M., Ontengco, Delia C.*

Extended-Spectrum β-Lactamases (ESBLs) are enzymes like TEM, SHV, and CTX-M produced by bacteria that renders the bacteria resistant to antibiotics commonly used for treatment. Laboratory tests may indicate that cephalosporins and monobactam are effective against ESBL-producing bacteria, but are actually ineffective clinically. This susceptibility/treatmentmismatched pattern leads to treatment failure, serious complications, and even death. This study determined the prevalence of ESBL-producing Enterobacteriaceae from in-patients of a tertiary hospital in Cavite. Isolates were collected from November 2007 to April 2008, screened and confirmed for ESBL-production using the Clinical Laboratory Standards Institute method. Molecular genotyping for TEM, SHV and CTX-M enzymes and DNA sequencing were performed on confirmed ESBL-producers. The patients' demographic profile was analyzed in correlation with presence of ESBLs. Extended-spectrum ß-lactamase production was confirmed in 15 out of 53 (28.3%) isolates that included 6 out of 15 Enterobacter aerogenes, 5 out of 25 E.coli. 3 out of 4 Proteus mirabilis, and 1 out of 1 Citrobacter diversus. Seven out of the fifteen of the ESBLconfirmed isolates expressed  $bla_{SHV-1}$ and bla<sub>SHV-5</sub> genotypes. Following earlier reports bla<sub>TEM-1</sub>,  $bla_{\text{CTX-M-15}}$ , on TEM and SHV types of ESBL, infection with bacteria producing  $bla_{CTX-M}$  is now being reported worldwide. Demographic profile of 15 patients infected with ESBL-producing bacteria includes the following: 14/15 females; 9/15 belonged to the elderly group (mean 72 yrs); 12/15 of the patients acquired the ESBLs from the community, and 3/15 from the hospital. Furthermore, these ESBL-producing bacteria were isolated from patients who have previously taken multiple antibiotics, were attached to invasive devices, and with underlying conditions like diabetes mellitus, hypertension, and other infections. Antimicrobial susceptibility patterns indicate high-level resistance to both ß-lactam and non-ß-lactam antibacterial agents, and were found to be susceptible only to meropenem (7/7) and imipenem (12/15), followed by amikacin (12/15). This study documents the first report in Cavite of isolates harboring  $bla_{\text{TEM}}$  and  $bla_{\text{SHV}}$ , and of *bla*<sub>CTX-M</sub> genotype in the Philippines. (Author's abstract)

*Keywords:* Medicine, Extended-spectrum  $\beta$ -Lactamase (ESBL), Enterobacteriaceae, Cephalosporins, Monobactam, Carbapenem

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 149-150 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0489

#### Multiplex PCR detection of *Mycobacterium tuberculosis* and characterization of mutations in katG and rpoB genes of resistant strains in Metro Manila *Cabanilla, Ma. Corazon C., Palmes-Saloma, Cynthia P.*

Tuberculosis (TB) remains to have the highest morbidity among infectious diseases. On the recent WHO survey, the Philippines ranks as the 9<sup>th</sup> high TB burden country, possibly due to poor sanitation, malnutrition, and lack of efficient and cost -effective means of detection and characterization of TB. This study tackles the problem of TB detection and characterization by developing a protocol that is able to detect and qualify resistance faster and

cheaper than current gold standards. Eight (8) respiratory aspirates were assayed by subjecting them to culture and drug susceptibility testing (DST), the gold standards for determination and qualification of TB strains. Four tested negative with culture and was automatically used as negative controls. Of the four positive controls, two were multidrug resistant (MDR) and the other two were sensitive. The genome sequence of H37Rv strain (Genbank Accession NC 000962) was then used to design primers for polymerase chain reaction (PCR) amplification. For multiplex detection, the primer pairs flank the insertion sequence IS611 0 which is ubiquitously found in several copies in the genome, and the hupB gene that is able to differentiate the closely related strains of M. bovis and M. tuberculosis. The primer two sets were able simultaneously determine if the sample contained M. tuberculosis genes. Of major relevance to the management of community TB is the enrolment of a patient into the correct treatment program based on drug susceptibility. For this, distinction between MDR from non-MDR strains was done using newly designed four inhouse primers for katG and rpoB genes which have been documented to contain the most common single nucleotide polymorphisms (SNPs) highly correlated with resistance to the first-line drugs rifampicin and isoniazid. These primers used were to characterize mutations in 15 MDR and five sensitive samples, and our results corroborate documented data that there is no one SNP that can universally predict resistance or susceptibility to the two MDR strains. However, the presence of some of these SNPs can initially direct treatment after rapid detection. (Author's abstract)

Keywords: Medicine, Multiplex PCR, M. tuberculosis, Multi-drug resistance, IS6110, hupB, rpoB, katG

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 151-152 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0490

#### Mutagenicity, clastogenicity and antimutagenicity of expressions, decoctions, tablet and syrup preparations from ''lagundi'' (Vitex negundo L.) Lim-Syllanco

Expressions, decoctions, tablet and syrup preparations from leaves of "lagundi" did not exhibit direct DNA damaging potential. These were not mutagenic before and after metabolic activation. These did not show chromosome breaking activity.

However, expressions, decoctions and tablet preparations from "lagundi" leaves reduced the genotoxicity of dimethylnitrosamine, tetracycline and N-nitrosopyrrolidine indicating that the test systems from "lagundi" possess antimutagenic activity. (Author's abstract)

**Keywords:** Medicine, Lagundi, Vitex negundo L., Genotoxicity of dimethylnitrosamine,, Tetracycline, Nnitrosopyrrolidine

Lagundi (Vitex negundo L.) monograph, Volume No. Technical Report series #6 Issue No., 14-18 (Filipiniana Analytics) Fil(B) R850.A1 P5 1989

#### A new look at heterophyidiasis (intestinal fluke infection): a food-borne parasitic zoonosis in the Philippines

### Belizario, Jr., V. Y., Bersabe, M. J., de Leon, W. U., Hilomen, V. V., Paller, G. V., de Guzman, Jr., A. D., Bugayong, M. G.

In the Philippines, the prevalence of heterophyldiasis has been noted to be low according to published literature. But in connection with an outbreak of intestinal capillariasis in Southern Philippines, community surveys showed heterophyid infection rates of 16. 7% and 15.7% in 1998 and 1999, respectively (Belizario et al., 2000), which may indicate a real problem of under reporting of this condition probably due to lack of consideration by clinicians and a lack of recognition in diagnostic laboratories. An active case detection was conducted by a team from College of Public Health, University of the Philippines Manila in Barangay San Isidro, Monkayo, Compostela Valley in May 2000. Thirty six percent of patients with a history of bowel disturbance (abdominal discomfort/pain and/or diarrhea) in the past 4 weeks were found to have heterophyidiasis. The most common clinical manifestations of heterophyldiasis were signs and symptoms of acid peptic disease or peptic ulcer disease. Stool examination results (7 to 14 days after treatment with praziguantel) revealed that cure rate among those with heterophyidiasis was excellent at 97.1% (34 out of 35 patients who were infected, treated and were seen on follow-up). Local people are fond of eating freshwater fishes, shrimps, crabs and frogs which they got from Saug River. Collected samples of possible intermediate hosts, which include six freshwater fish species and four other aquatic animals were examined and found to be infected with various parasites in different life cycle stages (i. e. from larvae. cercariae. metacercariae eggs, to adult forms). A number of intestinal parasitoses abound in the areas studied All of these are preventable and curable, provided that the proficiency of laboratory staff is enhanced to ensure accurate diagnosis which will then make appropriate treatment possible. In the case of intestinal fluke infection, early diagnosis and treatment are important to ensure prompt resolution of infection, hence, decreased morbidity and decreased chances for complications like heart or brain involvement. The results of this study illustrate the importance of recognition of the possible problem of heterophyldiasis and other food-borne parasitoses, accurate laboratory diagnosis, and recognition of possible intermediate hosts that will be crucial for control and prevention of this health problem at the community and local health system levels. (Author's abstract)

**Keywords:** Medicine, Heterophyidiasis, Acid peptic disease, Peptic ulcer disease, Praziquantel, Intestinal fluke infection

Philippine Health Systems Research: a scientific publication of DOH-funded researches 2000-2001, Volume No. 1 Issue No., 1-7 (Filipiniana Analytics) Fil(S) RA440.85 P543 2001

0492

#### Nutrition problems of the urban family Macapinlac, Manuel P.

A procedure for serum zinc determination whose accuracy had been validated by recovery studies was presented.

The se	erum	zinc	of healthy	adult	Filipino	students	was	$108.8 \pm 20.$	8 (Mean	± S.D.)	per 100	ml.	This mean	was
comparab	ole	to	thos	e	of	normal		healthy	subj	jects	from		abroad	in
which	ator	nic	absorpti	ion	had	been	use	ed as	the	metho	od o	f	determina	tion.

A group of 189 male blood donors gave lower zinc values when compared to the group of students or to some published values from abroad. A study of the differences in occupation of the different donors and their corresponding zinc values in serum suggest the possibility that occupations likely to be associated with low income tend to have lower serum zinc values.

Serum zinc levels determined before breakfast decreased by a mean of 15.1% when compared to values determined 30 minutes after lunch. There was no apparent correlation between serum zinc and hair zinc values, so that in adults, hair zinc levels did predictive not have any value on the serum zinc level. Serum zinc levels showed relation to changes in hemoglobin levels. no apparent

Within the age ranges of 19 to 49 years, serum and hair zinc showed no variations with age. (Author's summary)

Keywords: Medicine, Atomic absorption, Spectrophotometry, Zinc, Zinc-deficiency, Dwarfism, Iron-deficiency, Anemia

Science Diliman, Volume No. Issue No., 33-46 (Filipiniana Analytics) Fil(S) Q1.A3 S35 v.1 1980

0493

#### Performance evaluation of tailor made microspheres as sensing layer responsive to residual chloramphenicol in food matrices

Ebarvia, Benilda S., Ubando, Isaiah, Sevilla, III, Fortunato B.

Antibiotics like chloramphenicol are banned in food products of animal origin. Analysis of trace levels of chloramphenicol usually by GC-MS is expensive and could require tedious samples preparation. In this work, chloramphenicol-imprinted microspheres were synthesized via precipitation polymerization at 60°C using chloramphenicol as the template, and methacrlic acid as the monomer. Different crosslinkers like trimethylolpropane trimethacrylate (TRIM), ethylene glycol dimethacrylate and divinylbenzene were tried to produce the polymer. Their binding characteristics were evaluated by Scatchard analysis using UV Vis spectrophotometer. Two classes of binding sites were obtained under the concentration studied. from these polymer microspheres bearing the imprinted sites, the one prepared with TRIM crosslinker showed the highest binding capacity than the non-imprinted polymer and polymers prepared using other crosslinkers. The maximum binding sites were estimated to be about  $330 \ \mu g/g$ and 268 µg/g for the molecularly imprinted polymer and the non-imprinted polymer respectively. The adsorption isotherm of the imprinted polymer was fitted to the Freundlich equation and the heterogeniety index was estimated to about 0.976. Molecular capability of the said polymer as sensing layer to trace amount of chloramphenicol was also confirmed by gravimetric technique using a mass sensor. Results of sensor measurement obtained shows good accuracy and acceptable percent recovery in real samples. Further characterization of the resulting polymers were also performed using BET surface area analyzer, particle size analysis, and microscopic techniques. The study gives merit to the quality of spherical particulates in nano to micro size range. The proposed integration of this polymerization technique and sensor technology can be carried out for very minute analysis of chloramphenicol muchquickly with simple sample preparation. These polymers can also be utilized in sample screening and as effective adsorbent in separation processes. (Author's abstract)

**Keywords:** Medicine, Chloramphenicol, Scatchard analysis, Molecularly imprinted microspheres, Precipitation polymerization, Chemical mass sensor

#### Pharmacognostical studies on Vitex Negundo L. Cantoria, Magdal

Vitex consists of the fresh or partially-dried leaf and flowering top of *Vitex negundo* Linne (lagundi or Chastity Shrub) (Fam. Verbenaceae).

Vitex must contain not more than 2% of stems more than 2 mm in diameter and other foreign organic matter. (Author's abstract)

Keywords: Medicine, Lagundi, Vitex negundo L., Verbenaceae, Chastity shrub

Lagundi (Vitex negundo L.) monograph, Volume No. Technical Report series #6 Issue No. , 82-83 (Filipiniana Analytics) Fil(B) R850.A1 P5 1989

0495

#### Pharmacologic and toxicologic studies on lagundi (Vitex negundo, L.) Estrada, Hora

One hundred percent aqueous extract of "lagundi" has a lethal dose 50 of 103 gms/kg body weight in the adult albino mouse. Contractions of isolated tissue preparations of the rat duodenum, cat tracheal chain, and rat uterus were depressed. A bioassay method using the rat duodenum for the potency of batches of lagundi was established. (Author's abstract)

Keywords: Medicine, Lagundi, Vitex negundo L., Bioassay method

Lagundi (Vitex negundo L.) monograph, Volume No. Technical Report series #6 Issue No., 19-24 (Filipiniana Analytics) Fil(B) R850.A1 P5 1989

0496

#### Phytochemical studies on the leaves of Vitex negundo L. (lagundi) Dayrit, Fab

Five flavonoid compounds casticin. chrysoplenol D, luteolin, isoorientin luteolin-7-0-glucoside isolated the pharmacologically active and were from fractions of the leaf of negundo L. Chrysoplenol D was found relax Vitex to cat tracheal Chrysoplenol D, luteolin and isoorientin inhibited the release muscle. of histamine from rat peritonial mast cells with the following  $IC_{50}$  values: chrysoplenol D (100 uM), luteolin (85 uM) and isoorientin (4.4 uM). Casticin exhibited negligible activity. Chrysoplenol D and isoorientin were found to

inhibit	the	activity	of	5-lipoxygenase.
		•		1 10

Mutagenicity assay showed that the crude extracts and fractions were either nonmutagenic or antimutagenic. Among the pure compounds tested, only isoorientin exhibited slight mutagenic activity.

2-dimensional HPLC method and semi-quantitative TLC procedure Α а flavonoids. developed the amounts the Although have been to quantify of sample, preliminary indicate isoorientin variations occur from sample to results that pharmacologically-active the major flavonoid constituent in the is fraction. (Author's abstract)

Keywords: Medicine, Lagundi, Vitex negundo L., Chrysoplenol D, Luteolin, Isoorientin

Lagundi (Vitex negundo L.) monograph, Volume No. Technical Report series #6 Issue No., 67-81 (Filipiniana Analytics) Fil(B) R850.A1 P5 1989

#### 0497

#### Porous biphasic calcium phosphate ceramic for anopthalmic socket implant

Reyes, Jocelyn P., Celorico, Josefina R., de la Cuesta, Lina C., Filio, James M., Daan, Leonilo G., Bernardo, Severino T., Tumbocon, Anthony J.

A novel technique for processing porous biphasic calcium phosphate ceramic known as

Keywords: Medicine, Biphasic calcium phosphate, Pore former polymer foam, CaCO3, CaHP04.2H2O

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 24 Issue No. 2, 27-53 (Filipiniana Analytics) Fil(S) T1 N21 24/2 1999

#### 0498

#### Practice patterns of physicians in the management of patients admitted for acute sinusitis in Chong Hua Hospital, January 2003 - June 2006 Santos, Joyce Gayle R.

**Objective:** To describe the management practices of physicians for patients with acute sinusitis admitted in Chong Hua Hospital from January 2003 - June 2006. **Study Design:** Analytical cross-sectional study with retrospective mode of data collection. **Study Setting:** Chong Hua Hospital, a 500-bed capacity, privately-owned hospital providing primary, secondary and tertiary level of care in Cebu City. **Study Population:** Patients admitted to Chong Hua Hospital from January 2003 - June 2006 with discharge diagnosis of acute sinusitis. **Methods:** Charts of patients with the final diagnosis of acute sinusitis admitted in Chong Hua Hospital from January 2003 to June 2006 were reviewed. Data relevant to the objectives of the study were abstracted. These included patient demographic profile, clinical profile (admitting department, symptoms and pertinent physical examination findings upon admission), laboratory profile and medications prescribed. **Results:** The median age of patients admitted for acute sinusitis was 33 years (IR, 24 headache, facial pain and tenderness, nasal congestion and post-nasal drip. CBC determination was requested for all patients while transillumination of sinuses was not routinely done. Some patients

underwent x-ray of the paranasal sinuses and some were made to undergo CT scan evaluation. Polysinusitis was more common with the maxillary sinus most commonly involved. Most patients were prescribed with antibiotics. Co-amoxiclav, cefuroxime, quinolone and azithromycin were the common options. Reliance on adjunctive therapy was common which involved decongestants with or without antihistamines, antipyretics/analgesics, nasal sprays often with steroidcontaining preparations, mucolytics, palin antihistamines and orally administered steroids. one of the patients were managed with steam therapy. Median duration of hospital stay was 3 days (IR, 2 days - 4 days). Patients admitted under Internal Medicine had more diagnostic workup and were more often treated with antibiotics and other adjunctive therapy when compared with how patients of the other departments were managed. **Limitations:** The study did not address patient-relevant outcomes and determinants to patterns of care were not evaluated. **Conclusion:** Practice patterns of physicians caring for patients admitted for acute sinusitis in Chong Hua Hospital include routine CBC and occasionally x-ray of the paranasal sinuses and CT scan . Transillumination of sinuses is not routinely done. Antibiotics are commonly administered with predilection for co-amoxiclav, cephalosporin and quinoione. Adjunctive therapy is common involving decongestants, antihistamines, nasal sprays with or without steroids, mucolytics and analgesics. (**Author's abstract**)

Keywords: Medicine, Sinusitis, Antihistamine, Decongestants, Headache, Mucolytics, Analgesics

The Filipino Family Physician, Volume No. 45 Issue No. 3, 122-132 (Filipiniana Analytics) Fil(S) R97.4 F2 45/3 2007

0499

#### Pranic healing as adjunct treatment in functional dyspepsia

#### Amistoso-Recina, Grace, Apostol-Nicodemus, Leilanie S., Arellano, Gema A., Ruiz, Roberto L., Pumanes, Maria Consu

Background: Among patients diagnosed with dyspepsia consulting at the Ambulatory Care Unit of PGH, majority don't have money to buy a PPI, and H2 block or any antacid to relieve acute abdominal pain. A noninvasive treatment alternative, pranic healing, will be used as an adjunct to relieve abdominal pain. Objectives: To determine the effectiveness of pranic healing as an adjunct in the management of acute abdominal pain of patients with functional dyspepsia at the Ambulatory Care Unit. Methods: This was an open-label randomized controlled trial, conducted at the Adult Ambulatory Care Unit (AACU/AMBU) of the Philippine General Hospital (PGH), comparing two groups of patients aged 18 and above diagnosed with functional dyspepsia. Using sequences determined by the table of random numbers, 65 patients were randomized to the two interventions. A total of33 patients were randomized to the Control Group and 32 patients were randomized to the Treatment Group. Patients in the control group were given intramuscular (1M) injection of 1 ampule of H2 Blocker (Ranitidine 25 mg/ml/ampule). The Treatment Group received a combination of H2 Blocker (Ranitidine 25 mglml/ampule given 1M) and pranic healing. Visual Analogue Scale (VAS) score was used to assess the degree of severity pain. Monitoring was done every 5 minutes for a duration of 60 minutes, 10 minutes after the administration of intervention for each treatment arm . The outcomes measured in this study were: the onset of alleviation of pain as measured in minutes and the degree of pain relief before and after intervention as measured by the VAS score of each group and the difference between two groups. Results: There was a decrease in the pain score after 30 minutes, with maximum effect achieved at 55 minutes in the control group, with а significant relief from the initial VAS score mean of 7.36 to 5 after the 60 minute observation, p value <0.0001. In the treatment group, a significant decrease in the V AS score after 10 minutes with maximum effect at 60 minutes with the initial V AS of 7.75 to 1.38 at the end of the observation period, p value <0.0001. The VAS score decreased about 2.72 from baseline V AS with the Treatment Group compared to the Control Group with only 0.47 decrease from baseline VAS with value < 0.0001. The mean difference between р the effects of the treatment groups before and after the intervention were also significant (p value < 0.001) with mean difference measured, -3.61 (95% CI: -4.77 - -2.46). Conclusion: Pranic healing as an adjunct in the management of acute abdominal pain of patients with functional dyspepsia is proven effective not only in lowering the severity of abdominal pain but also in promoting a faster onset of pain relief. (Author's abstract)

Keywords: Medicine, Dyspepsia, Pranic healing, Adult Ambulatory Care Unit (AACUIAMBU)

The Filipino Family Physician, Volume No. 46 Issue No. 2, 100-107 (Filipiniana Analytics) Fil(S) R97.4 F2 46/2 2008

0500

### Predictors of poor compliance to medications among adult Filipino patients diagnosed with hypertension in selected provinces of the Philippines

Lavina, Shiela Marie S., Valera, Madeleine R., Wagner, Anita K., Ross-Degnan, Dennis, Banting, Michael Paul

С.

**Background:** Compliance to prescribed medications remains to be one of the most important issues to address in any physician-patient clinical encounter. Hypertension remained to be one of the top five leading causes of morbidity in the Philippines (FHSIS, 2005). Many factors affecting treatment compliance are related to patients, physicians and health care characteristics. Identification of these factors will help the physician-patient consultation to be more pro-active with physicians actively identifying risk of poor compliance at the initial consultation day and hence provide preventive interventions. Objective: To determine sociodemographic and clinical factors that are predictive of poor compliance to prescribed medications among adult hypertensive Filipinos. Methodology: This was a cross-sectional study involving randomly selected adult Filipino patients who were admitted in hospitals from July to September 2005 and January to March 2006. A total of 270 patients were randomly selected from the sampling frames and the interview process was administered by trained staff. Informed consent for interview was verbally obtained and respondents were given the option to stop the interview process. Results: A total of 270 adult hypertensives were interviewed and included in the final analysis with the average age of respondents at 59 years old ( $\pm$  13 years). Length of hospital stay was at an average of 3.4 days ( $\pm$ 2.78 days ) with dyslipidemia as a comorbid illness present in 59% of respondents. There was a higher proportion of respondents reporting poor compliance in Stage 2 hypertension (43%) followed by respondents with pre-hypertension at (31%) and 22% among the respondents with stage 1 hypertension. On univariate analysis, factors found to be associated with poor compliance with medications were divided into three categories: patient specific factors, clinical features that may affect blood pressure control and clinical interactions between physicians and their patients. In the multivariate model, patients who did not present with dyslipidemia as co-morbid illness were 3 times more likely to be noncompliant to blood pressure medicines while patients with no history of previous hospitalization were 5 times more likely to be non-compliant. Hypertension stage was also a significant predictor for non-compliance. Conclusion : Factors associated with poor compliance with anti-hypertensive medications among Filipinos diagnosed with hypertension include low educational attainment, poor knowledge and misconceptions about the disease, low economic status, monotherapy, no dyslipidemia or exercise regimens, with no history of previous hospitalization and those who reported having stage I hypertension. (Author's abstract)

Keywords: Medicine, Poor compliance, Hypertension, Filipinos, Predictors

The Filipino Family Physician, Volume No. 46 Issue No. 1, 55-61 (Filipiniana Analytics) Fil(S) R97.4 F2 46/1 2008

#### The prevalence of depression in the elderly at Area C, San Martin II, Sapang Palay, Del Monte Bulacan Cruz, Christine A.L.

Depression is the most common psychiatric illness in the elderly. Despite the high prevalence, it frequently goes undiagnosed and untreated. This is unfortunate since it has a lot of potential sequelae that is devastating, including suicide. Depression screening for older adults with the Geriatric Depression Scale has been recommended. There are different acceptable modes of treatment for depression: medications/drug therapy, ECT and psychotherapy. Thus, it is important to screen so that adequate treatment may be provided. **Method:** A 4 week study was conducted at San Martin II, Area C, Sapang Palay, Bulacan. Out of the 76 patients who met the inclusion exclusion criteria, 28 were found to be depressed using the GDS. **Results:** A 34 percent prevalence rate was found for depression in the elderly at Area C, San Martin II, Sapang Palay, Del Monte, Bulacan. (**Author's abstract**)

Keywords: Medicine, Depression, Psychotherapy, Psychiatric illness, Geriatric depression scale

The Filipino Family Physician, Volume No. 46 Issue No. 2, 73-77 (Filipiniana Analytics) Fil(S) R97.4 F2 46/2 2008

0502

#### Probing the decisions behind induced abortion in the Philippines Perez, Aurora E.

Often a subject of emotional debates that unleash strong and opposing views, abortion, in particular, induced abortions, remain a health concern deserving public health policy action. While there have been several studies on the causes and consequences of abortion, data on a scale that would generate reliable estimates of the prevalence of abortion for the whole country remains scarce. This paper uses a mix of available data on abortion in the Philippines and compliments the profiles of women who have had abortions with life stories to give the abortion statistics the needed human face. The compelling circumstances surrounding the hard decisions to terminate unwanted pregnancies show that Family Planning Program interventions on preventing unwanted pregnancies have a potential of reducing induced abortions. Given the combination of the secrecy of abortion decisions and procedures and the limited capacity of our health system to provide post-abortion care and treatment due to limited resources to meet competing health needs, it is crucial that imperfections in the use of the more effective methods of family planning are addressed to prevent unwanted pregnancies, an event in women's lives that push them into preventable complications and ill health effects of induced abortions and at worst, maternal deaths. (Author's abstract)

Keywords: Medicine, Induced abortion, Health policy, Unwanted pregnancies, Post-abortion care

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 21 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

0503

The relation of family function and adherence to tuberculosis treatment Javier, Ramon Jason M., Isidro-Lapena, Josefina, Lavina, Shiela Marie

Pulmonary tuberculosis remains a major public health problem in the Philippines. Control depends largely on the capacity of various health care facilities to administer the prescribed tuberculosis management, and partly on the adherence to treatment of patients. An understanding of how family relationships, especially social support, promote health and buffer the effects of stress can help the family physician to utilize the resources in patient care. **Objective:** This study was conducted to determine if there was an existing relationship with family function, as measured by the Family APGAR scores, and adherence to tuberculosis treatment. Methods: This was a cohort study which included 111 subjects, using the purposive method of sampling. Sociodemographic profile, family characteristics, health beliefs and health-seeking behavior were obtained using a data collection form. Family function was measured using the English and Filipino Family APGAR. Measure of adherence was based primarily on the actual verbal reporting of the patient upon completion of the tuberculosis regimen or second follow-up consultation. Results: Sociodemographic factors which statistically influence treatment adherence include patient's level of education, occupation, individual monthly income and total family income. Majority of subjects were middle children belonging to the second filial generation of their respective families. A significant difference (pvalue <0.01) in treatment adherence was noted between the success group (67.9%) and failure group (29.1%). The odds of being able to adhere to the tuberculosis regimen was twice as high among patients belonging to functional families compared to dysfunctional families. Conclusion: The Family APGAR is highly recommended to be used routinely among all patients, especially among those with chronic diseases. The said tool is deemed effective in predicting health outcome in various medical cases. (Author's abstract)

Keywords: Medicine, Pulmonary tuberculosis, Family APGAR, Treatment adherence

The Filipino Family Physician, Volume No. 46 Issue No. 2, 108-115 (Filipiniana Analytics) Fil(S) R97.4 F2 46/2 2008

0504

#### Resolving questioned paternity issues using a Philippine genetic database De Ungria, Maria Corazon A., Tabbada, Kristina A., Delfin, Frederick C., Frani, Alma M., Magno, Michelle M.F., Calacal, Gayvelline C., Halos, Saturnina C.

The utility of the Philippine genetic database consisting of seven Short Tandem Repeat (STR) markers for testing often questioned paternity cases was investigated. The markers used were HUMvWA, HUMTH01, HUMCSF1PO, HUMFOLP23, D8S306, HUMFES/FPS, and HUMF13AO1. These markers had a combined Power of Paternity Exclusion of 99.17%. Due to the gravity of some cases handled in the laboratory, routine procedures must be assessed to determine the capacity of the analysis to exclude a non-father or predict paternity. Clients showed a preference for only testing father and child to lower costs and reduce conflicts, particularly when the mother objects to the conduct of DNA tests, or when she is deceased or cannot be located. The Probability of Paternity was calculated with and without the mother's profile in each of the cases. In all instances, results were more informative when the mother's DNA profile was included. Moreover, variations in the allelic distribution of five STR markers among eight Caucasian, one African-American, and two Amerindian (Argentina) populations resulted in significant differences in Probability of Paternity estimates compared to those calculated using the Philippine database.

Based on the results of the present study, it is recommended that tests on alleged father-child samples be performed to screen for at least two mismatches. In the absence of these mismatches, further analysis that includes the mother's DNA profile is recommended. Moreover, it is recommended that a Philippine genetic database be used for DNA-based paternity testing in the Philippines. (Author's abstract)

**Keywords:** Medicine, Short tandem repeat markers, Philippine genetic database, Inclusions, Exclusions, Paternity trios, Motherless cases

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 14 Issue No. 1, 8-16 (Filipiniana Analytics) Fil(S) Q1.A3 S4 14/1 2002

#### The rifasaf project: a case-control study on risk factors for stroke among Filipinos The PNA-DOH Rifasaf collabo

**OBJECTIVE :** To detumine the modifiable risk factors for stroke among Filipinos.

DESIGN: Multicenter, multiregional hospital-based 1 :1 matched case -control study

**SETTING:** 55 tertiary hospitals located in 13 of the 16 administrative regions of the Philippines consisting of 961 first -ever stroke cases with 961 hospital based ,controls were enrolled. Cases were patients with clinical diagnosis of stroke affirmed by a neurologist of the Philippine Neurological Association while controls were patients admitted to the same hospital with no history of stroke.

**MEASUREMENT:** A structured questionnaire, patterned partly after the validated INTERHEART questionnaire was used to determine well established and emerging risk factors for stroke. Thirty (30) trained research assistants conducted the interview.

**RESULTS:** By univariate matched analysis, the following risk factors were shown to be significant, namely: hypertension, diabetes, transient ischemic attack (TIA), myocardial infarction (MI), atrial fibrillation (AF), rheumatic heart disease (RHD), migraine, habitual snoring, stress, frequent alcohol use, and body mass index (BMI)  $\geq 26$ . On conditional multiple logistic regression, the following were found to be independent significant risk factors: hypertension (OR 6.01 95% CI 4.49 - 8.05), diabetes (OR 1.60, 95% CI 1.01 - 2.32), AF (OR 1.91, 0.51 - 7.19), MI (OR 4.67, 95% CI 1.10 - 1.86), habitual snoring (OR 3.37, 2.49 - 4.58), stress (OR 1.69, 95% CI 1.25 - 2.29) and frequent alcohol use (OR 1.75, 95% CI 1.14 - 2.70).

**CONCLUSIONS:** RIFASAF The project validates most of the well-established risk factors for stroke cited in foreign studies e.g. hypertension, diabetes, MI, AF, RHD and smoking. In addition, habitual snoring, stress and frequent alcohol intake are important emerging risk factors that were found to be locally significant. Classifying stroke into infarct and hemorrhagic type, the following were found to be significant for both types, namely, hypertension, frequent alcohol use, habitual snoring and stress. Ischemic type of stroke but not hemorrhagic stroke was significantly associated with diabetes, TIA, MI, AF, RHD, smoking and infection while BMI >26 was associated to the hemorrhagic type of stroke alone. (Author's abstract)

**Keywords:** Medicine, Hemorrhagic stroke, Diabetes, Stroke, Hypertension, Transient ischemic attack (TJA), Myocardial infarction (MI), Atrial fibrillation (AF), Rheumatic heart disease (RHD)

The Journal of the Philippine Medical Association, Volume No. Centennial issue Issue No., 116-122 (Filipiniana Analytics) Fil(S) R97.5 P57 2004 0505

#### The role of radiation in tissue banking Agcaoili, Norberto

The availability of safe and effective tissue allografts for the treatment of various bone defects has been the primary concern of orthopedic surgeons in the Philippine over the past few decades. With the growing industrialization of the country and the improvement of medical facilities over the past few years, the problems related to limb preservation or limb salvage procedures have been increasing. Related to this is the need for tissue allografts for biologic dressings and soft tissue reconstruction like tendons, fascia and ligaments. Thus the Department of Orthopedics at the University of the Philippines - Philippine General Hospital started the project of tissue preservation - tissue banking in 1984 as a study funded by the International Atomic Energy Agency. This initial study became the basis of the establishment of the first and only existing Tissue Bank in the country today. Aside from the proper donor selection, procurement and processing, a most important aspect in this project is the sterilization of these allografts. Various methods of tissue sterilization have been established but so far the most popular, practical and safest has been the use of ionizing radiation. The paper will highlight the history, the practice and current status of tissue and bone banking and the important role of radiation as the primary method of sterilization of the tissue allografts for the safe use in reconstruction of various orthopedic conditions in the Philippines. The recent experience of the author on bone transplantation and limb salvage

procedures will be presented. (Author's abstract)

Keywords: Medicine, Tissue allografts, Tendons, Fascia, Ligaments

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No., 175-176 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

0507

### Sex preselection in animals: current methods and applications *Valdez, Conrado A.*

Advancement in sexing technologies when used with other animal reproductive technologies presents opportunities to boost food production from animal sources and thus increases the availability of animal protein in the Filipino diet. The ability to predetermine the sex of offspring before and after fertilization of the ovum would allow farmers to raise animals of the desired sex based on their breeding needs and market demands. This paper reviews current sperm sexing technologies such as flow cytometry or cell sorting, H-Y antigen detection, and detection of sex-specific proteins on the sperm surface as well as embryo sexing technologies such as chromosome analysis, polymerase chain reaction and other methods. Moreover, it discusses how sexing technologies can further enhance other reproductive technologies namely artificial insemination, embryo transfer, in vitro fertilization, embryo splitting and cryopreservation, and the potential applications of these technologies in animal production. (Author's abstract)

Keywords: Medicine, DNA, Embryo, Flow-cytometry, Sex chromosomes, Sperm

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 13-14 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

#### Single nucleotide polymorphism genotyping of antithrombotic therapy resistance markers using high resolution melt analysis

#### Aquino, Gerald Ryan R., Cangas, Kristine M., Caringal, Ma. Alegria T., Palmos, Denice Mae, Trocino, Bianca Beatriz V., Lazaro, Jose Enrico H.

High resolution melt (HRM) analysis is a powerful technique for detecting DNA sequence variations such as mutations, polymorphisms and epigenetic differences. Single Nucleotide Polymorphisms (SNPs) in the CYP3A4 and CYP2C19 genes coding for Cytochrome P450 enzymes involved in the metabolism of nearly all drugs have been reported to be associated with resistance to clopidogrel, an antiplatelet aggregation durg. Moreover, SNPs in the  $P2Y_{12}$  gene coding for the target receptor of the active metabolite of clopidogrel have been determined to be associated with high platelet reactivity, thus possibly lowering response to clopidogrel as well. In this study, we employed HRM analysis as a diagnostic test to detect these SNPs. Primers were designed to amplify short regions containing the CYP3A4\*1G (G>A), CYP2C19\*2 (G>A), P2Y12 G36T (T>G) and P2Y12 C18T (C>T) SNPs. Blood samples were blotted on Whatman FTA® Elute membrane, from which DNA was extracted. Eleven samples from volunteers were used for screening the three representative genotypes, which we termed homozygous mutant, heterozygous, and homozygous wild-type. Melting temperatures and melting curves generated after fluorescence normalization, temperature adjustment, and difference analysis of the samples revealed distinct genotypes. Larger amplicons were generated by PCR for samples representative of the genotypes and sent for sequencing. Sequencing confirmed the heterozygous genotype for all SNPs, and one homozygous genotype for CYP3A4\*G (mutant), P2Y12 G36T (mutant), and P2Y12 C18T (wild-type). We are waiting the completion of sequencing for the remaining homozygous genotypes. Current results nonetheless suggest a reliable protocol for detecting the heterozygote genotype of PYP3A4\*1G, CYP2C19\*2, P2Y12 G36T, and P2Y12 C18T using HRM analysis. (Author's abstract)

*Keywords:* Medicine, Polymerase chain reaction, High resolution melting analysis, Single nucleotide polymorphism, Genotyping, Clopidogrel, Cytochrome, P450, P2Y12 platelet receptor

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 203 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0509

#### Studies on Schistosomiasis japonica and Saponins Garcia, Edito G., Cabrera, Benjamin D.

The molluscicidal activity of the bark of *Entada phaseoloides* and extracts from tubers of its related specie, *Entada parvifolia* against *Oncomelania quadrasi*, the snail intermediate host of *Shistosoma japonicum* in the Philippines were determined.

The commercial gogo bark applied to waters with *O. quadrasi*, in the proportion of 2 gms/liter will kill 100% of snails within 24 hours. At this concentration miracidia and cercariae of *S. japonicum* in the same waters will die within one hours, thus, making the water safe or noninfective for some time. At the dose 100 gms/sqm of water-covered terrestial snail habitats, provided previously cleared of vegetations, at least 90% of *O. quadrasi* will die within 24 hours. These measures can be practical on a self-help basis by inhabitants of schistosomiasis endemic areas where gogo plant grows or where its bark is marketed.

At dilution of 1:5,000 saponin extracted from tubers of *E. parvifolia* killed at least 90% of snails after 24 hours exposure while ethanol (crude saponin) and other extracts require at least 1:2,000 concentration to kill at least 90% of *O. quadrasi*. At these concentrations and the expenses and time involved in the preparation of these extracts, they are not economical or practical for large scale use of molluscicides.

It is suggested that methods of extraction and purification which require little time of preparation and a cheaper but of higher recovery rate of molluscicidal principles be developed.

Surveys of barrios in three towns of Leyte, endemic for *Schistosomiasis japonica* using the circumoval-precipitin test (COPT) and stool examination in the same subjects were undertaken. Findings show that the use of blood COPT method is advantageous over that of the stool examination in *schistosomiasis* surveys as its prescribed procedure is simple, specific and more sensitive. Moreover, the prevalence rate it determined was higher than that obtained by the stool examination in all three towns studied with underestimate prevalence from 9 to 19%.

Approximately 73 per cent of field rats were found infected with schistosomiasis as revealed by the finding of liver sections; 49 showed sections eggs in per cent eggs in of the intestines and about 13 per cent showed eggs in the stool. The fact that field rats frequent rice fields in quest of frequency of their defecation food and the should be considered seriously in trying to assess the role of field rats in the dissemination of the infection. Whereas it is true that humans, in schistosoma endemic areas in Leyte, are still the important source of infection, field rats could play the role of maintaining the infection in nature and may be responsible in contaminating areas where feces are never deposited. (Author's abstract)

**Keywords:** Medicine, Schistosomiasis japonica, Entada phaseoloides, Entada parvifolia, Oncomelania quadrasi, Saponins

Science Diliman, Volume No. Issue No., 47-79 (Filipiniana Analytics) Fil(S) Q1.A3 S35 v.1 1980

0510

#### Studies on the outer root bark of *Kokoona ochracea* (ELM) Merr. (family celastraceae) *Cantoria, Magdalena C., Edrada, Ru Angelie M.*

Kokoona ochracea (Elm.) Merr. (Fam. Celastraceae), one of eight species in the genus Kokoona, is a tree endemic to the Philippines, particularly to Palawan. It is locally known as

Keywords: Medicine, Kokoona ochracea, Repetik, Enzyme 5-lipoxygenBse, Erythrocyte hemolysis

NRCP Research Journal, Volume No. 3 Issue No. 2, 67-100 (Filipiniana Analytics) Fil(S) Q179.9 N323 3/2 1993

0511

#### A study on the common superstitious health beliefs and practices among randomly selected pregnant women in Punta Engaño, Mactan, Cebu *Lozada, Marissa B.*

**Objective:** To identify the superstitious health beliefs and practices of pregnant women in Punta Engaiio, Mactan, Cebu. **Design:** Descriptive cross-sectional study. **Setting:** Punta Engaiio Barangay Health Center. **Study Population:** Pregnant women residing in Punta Engaiio, going to the barangay health center for prenatal care.

Methodology: The questionnaires were administered by personal interview of 37 randomly selected pregnant women going to the Punta Engaiio Barangay Health Center for prenatal check-ups. Data collection was done from June to October, 2006. Demographic characteristics and data on adherence to beliefs and practices of respondents were assessed using descriptive statistics. **Results:** The 37 subjects included in the study have a mean age of 28.34. whom belonging Majority of to the 21-25 years old age bracket (29.72%), primigravida (29.72%), and 31-35 weeks of gestation (29.72%). There were 30 superstitious health practices and considered either beneficial or not causing harm, while 6 (20%) were found to be negative or potentially harmful. Conclusion: This study showed that despite modernization, there still exists harmful health practices that need to be addressed in order to promote and increase chances of safe delivery and consequently prevent morbidity and mortality. (Author's abstract)

Keywords: Medicine, Belief, Health practice, Superstition

The Filipino Family Physician, Volume No. 46 Issue No. 2, 87-99 (Filipiniana Analytics) Fil(S) R97.4 F2 46/2 2008

### Women in health development: the Mangyans of Mindoro Province *Corcega, Thelma F.*

The Alma Ata Declaration states that "the people have the right and duty to participate individually and collectively in the planning and implementation of their health care." This means that community involvement in health development is fundamental in the battle for health. And, as the author demonstrate below, its participation in health research is necessary in the process of finding better ways and methods to provide health for all.

Community members must be involved in planning, implementing and evaluating their own health care. Properly interpreted, it can mean the harnessing of community knowledge and culture, community enthusiasm and community resources toward improved planning and implementation of health programmes. (Author's abstract)

Keywords: Medicine, Health development, Socio-economically depressed, Rural agrarian community, Ethnic in nature

Philippine Journal of Nursing, Volume No. 69 Issue No. 1-2, 23-27 (Filipiniana Analytics) Fil(S) RT1 P53 69/1-2 1999

#### PHYSICS

0513

#### Alkaloid studies on selected Philippine plants: a summary report Aguinaldo, Alicia M., Espeso, E.I., Garcia, C.P., Guevara, B.Q., Nonato, M.G., Recio, B.V.

Alkaloid field survey in selected areas of Luzon and in central, southern, and northern areas of Palawan provided the isolation of 8 alkaloids from 6 plants belonging to 6 families. Two of these alkaloids were found to be novel.

This work presents a compilation on the alkaloids isolated and characterized from these 6 indigenous plants. Identification of these alkaloids were done by chemical and spectroscopic methods. (Author's abstract)

Keywords: Physics, Alkaloid, Ipomoea muricata (L.) Jacq., I. alba, I. hardwickii

NRCP Research Journal, Volume No. 1 Issue No. 1, 76-82 (Filipiniana Analytics) Fil(S) Q179.9 N323 1/1 1992

0514

#### An analysis of the precipitable water vapor observed over the PIMO GPS station Cruz, F. T., Villarin, J. T.

Remote sensing of the atmosphere using Global Positioning Systems has been made possible with the derivation of the precipitable water vapor (PWV) from the tropospheric wet delay experienced by the signal propagation. Although limited by the missing observational data from the receiver, it is observed that the PWV obtained from this data gives reasonable values when considered for the cases of wet and dry seasons and when analyzed with a measurable meteorological variable, such as the amount of rainfall. A continual update of the record for PWV is highly recommended for further studies on the behavior of the atmospheric water vapor and its contribution to the changing climate. (Author's abstract)

Keywords: Physics, Precipitable water vapor (PWV), Global positioning systems, Remote sensing of the atmosphere, Meteorological variable

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 84-87 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

0515

#### Angular and lateral resolution study in pCT imaging involving biological tissues Quiñones, Catherine Therese J., Maratas, Jan Mickelle V., Nawang, Salasa A.

The angular and lateral resolutions were studied for possible application in proton Computed Tomography (pCT) imaging which is a prerequisite procedure for radiation therapy. These quantities provide a measure of the sharpness of the image using proton beams but unlike the conventional x-ray imaging, protons suffer from deflections due to multiple Coulomb scattering (MCS) interactions. In order to improve pCT images, analytical formulas that model the effect of MCS on individual proton trajectories were investigated.

The standard deviation of the angular ( $\sigma_u$ ) and lateral ( $\sigma_y$ ) distributions were calculated using analytical MCS reported in two journals: (a) *Phys. Med. Biol.*, 49 (2004), 2899-911 and (b) *Med. Phys.*, 35 (2008), 4849-56. In this study, two methods were performed: the numerical method and the sampling method.

During the simulation, a pencil beam profile of protons is directed to a cubic phantom (20 cm<sup>3</sup> for water, soft tissue or muscle tissue and 10 cm<sup>3</sup> for compact bone) using the Geant4 toolkit. Fifty thousand protons were bombarded at incident energies 200 MeV and 250 MeV. A 5<sup>th</sup> order polynomial was then used to parameterize the energy loss function. To test the validity of the analytical models, the angular and lateral distributions were obtained by Monte Carlo sampling of the exit protons. The  $\sigma_u$  and  $\sigma_y$  were extracted and compared with the result of the

analytical

Results show that for a 200 MeV incident proton, the angular and lateral scattering was around 2 degrees and 3.27 mm, respectively, while for the 250 MeV the values were 1.38 degrees and 2.5 mm, respectively. Also, the inclusion of a logarithmic correction factor to the MCS model improved the analytical  $\sigma_u$  and  $\sigma_y$  values with an error of about 17%. In conclusion, good resolution was observed at higher energies. (Author's abstract)

Keywords: Physics, Proton computed tomography, pCT, MCS, Lateral resolution, Angular resolution

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 184 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0516

## Anisotropic surface tecturing of silicon substrate using alkaline solution for solar cell application

#### Vacalares, Kayrol Ann B., Vequizo, Reynaldo M., Alguno, Arnold C.

High-efficiency silicon solar cells need a textured front surface to reduce the reflectance of incident light and to improve light trapping using cost-effective method. In this work, we report on the anisotropic surface texturing of Si(100) substrates using alkaline solution, forming pyramidal structures on its front surface. This method provides a straight forward and cost-effective approach. We utilized a mirror-polished single crystalline Si(100) substrate for texturing using alkaline solution. The alkaline mixtures contained sodium hydroxide, isopropyl alcohol and deionized water. The concentration of the alkaline solution was held constant while varying the texture time. The surface morphology of the textured surface is investigated by Scanning Electron Microscopy (SEM) and its reflectance is measured using UV-Vis Spectrometer. Results showed that the sizes and shape of the resulting pyramids after texturing process are dependent on the texturing time. Furthermore, the pyramid density increases with increasing etching time. Moreover, SEM images revealed that the size and the uniformity of the pyramids affect the reflectance of the incident light as depicted in the UV-Vis spectra of the mirror-polished and textured silicon samples. It was found that reflectance of the incident light could be reduced up to less than 20 percent by optimizing the surface morphology of the textured silicon. It is suggested that having a large and almost uniformly distributed pyramids on the Si surface will drastically reduce the reflectivity. We also present in this study a model that will describe and discuss the effects on the reflectance in relation to the distribution of pyramids in terms of distance and size. (Author's abstract)

Keywords: Physics, Solar cells, Anisotropic surface texturing, Reflectivity, Alkaline solution

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 181 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0517

Broadband continuum generation in single-mode optical fiber Maraña, B. D., Gabayno, J. F., Garcia, W. O.
We, report broadband continuum generation in a single-mode step-index optical fiber pumped by the second harmonic (532 nm) of a Nd:YAG laser. The continuum started to appear together with the first order Stokes at 545 nm with an input power of 11 mW. The appearance of the second-order Stokes is distinctly observed at 557.5 nm for 96 mW input power. The generated continuum spans 123.12 THz (550- 712 nm). Asymmetric cross-phase modulation-induced spectral sidebands were also observed. (Author's abstract)

Keywords: Physics, Optical fiber, Single-mode, Nd: YAG laser

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 70-73 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

0518

#### Calorimetric measurements of the output power of the 2.48 GHz commercial magnetron Rosario, Leo Mendel D., Tumlos, Roy B.

A 2.45 GHz magnetron from a domestic microwave oven, with a power output rating of 1.5 kW, is utilized as the microwave source in the design of a multipurpose electron cyclotron resonance plasma device in the Plasma Physics Laboratory of the National Institute of Physics. Measurements of the power output to a 2 liter water load and a dummy load were obtained using calorimetry. The experiment shows that it is possible to achieve a relatively stable maximum average power of 190 W delivered to the 2 liter water load continuously for at least 10 min. It is also shown that the magnetron can deliver a maximum power of about 2.2 kW. (Author's abstract)

Keywords: Physics, Calorimetric measurement, Magnetron, Microwave

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 31-35 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

0519

#### Derivation of third order MHD equations Jirkovsky, L., Bo-ot, L.

As a continuation and improvement on previous works, we derive a third order MHD equation through a projection and perturbation formalism that we will apply to various MHD flows. It is shown that the model can be linked to the theory where structure and geometry of the particle plays a role in explaining turbulence. (Author's abstract)

Keywords: Physics, Projection techniques, Turbulence, Non-equilibrium phase transition

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 13 Issue No. 2, 75-77 (Filipiniana Analytics) Fil(S) Q1.A3 S4 13/2 2001

#### Device fabrication of 60 $\mu$ m resonant cavity light-emitting diode

Reyes, J. J. C., Bisquerra, W., Sarmago, R. V., Salvador, A. A.

An array of 60-mm-diameter resonant cavity light-emitting diodes suited for coupling with fiber optic were fabricated using standard device fabrication technique. I-V characterization was used to determine the viability of the device fabricating process. Under forward bias, the turn-on voltage of the devices is  $1.95\hat{a} \notin 2.45$  V with a series resistance of  $17\hat{a} \notin 14$  kW. Under reverse bias, the devices showed a breakdown voltage of 35 V. (Author's abstract)

Keywords: Physics, Light-emitting diode, Fiber optic, GaAs

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 1-5 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

#### 0521

#### Differentiating AC and DC field effects on the magnetic susceptibility of bulk YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub>.

Î′

Afalla, Jessica Pauline C., Sarmago, Roland V.

A low field AC magnetic susceptibility has been measured for a superconducting bulk  $YBa_2Cu_3O_{.1'}$  sample with an AC excitation field superimposed with a DC field. The effects on the susceptibility due to either type of field have been interpreted without any assumption regarding the presence of vortices in the material. From the in-phase susceptibility data, saturation values show that increasing the AC field strength causes a decrease in shielding ability and a persistence of intergranular losses to lower temperatures. The intergranular loss peaks in the out of phase susceptibility data show shifting to lower temperature in accordance with the in-phase data. Increasing the DC field strength does not cause the saturation values to decrease, but rather, saturation values remain at the same level for the in-phase susceptibility data, showing consistency in the sample's shielding ability. However, increasing DC field strength increases the peak height for the intergranular loss peaks, but the peak does not shift to lower temperatures, thus greater energy is expended to shield the DC excitation, but without causing losses to persist to lower temperatures. (Author's abstract)

**Keywords:** Physics, 74.2S.Ha Magnetic properties, 74.62.-c Transition temperature variations, 74.72.Bk Y-based cuprates

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 21 Issue No. 2, 25-34 (Filipiniana Analytics) Fil(S) Q1.A3 S4 21/2 2009

0522

As synthesis of low-dimensional magnetic systems become possible, the need for theoretical understanding of their behavior arises. in this work, the authors explore a one-dimensional magnetic structure with the spins having dipolar interaction. (Author's abstract)

Keywords: Physics, One-dimensional, Magnetization, Algorithm

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 8-9 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

0523

#### Double sign reversal of the hall voltage in Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>8+Î'</sub> thin film dela Cruz, Aaron Paul C., de la Cruz, Clarina R., Sarmago, Roland V.

Hall measurement was done on a Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>8+ $\hat{1}'}$  liquid phase epitaxy (LPE) thin film. The Hall voltage,  $V_{H'}$  was obtained using the method of magnetic field direction reversal. Below the critical temperature, it was found that  $V_H$  changes sign from positive to negative until it reaches a negative dip, after which it increases again to become zero and undergo a second sign change. With decreasing applied magnetic field, this dip was observed to become more prominent and greater in magnitude and to shift to lower temperatures. The sign change is explained by considering that the Hall field consists of two anti-parallel components: one is attributed to the deflection of the charge carriers by the Lorentz force, and the other is attributed to the dynamic motion of vortices in the mixed state. (Author's abstract)</sub>

Keywords: Physics, Hall effect, Hall voltage, Sign reversal, Vortex motion

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 2, 41-46 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/2 2003

0524

#### The effect of adhesion force on cell elastic modulus Villaruz, Lara Gay, Bernido, Christopher, Carpio-Bernido, Ma. Victoria, Otadoy, Roland, Bacabac, Rommel

The ability of cells to deform or resist deformation affects several important factors of cell function. Most studies infer the elastic modulus of a living cell from the simultaneous measurements of forces and deformations exerted on the cell, based on the Hertz model. However, the force-distance curves are affected by indenter-cell adhesion forces, and neglecting this effect may result in systematic errors in the determination of the Young's modulus of elasticity.

For the first time, the Hertz model was extended to include the effect of adhesion in the description of contact stiffness by using the Lennard-Jones potential to model the inter-molecular interaction between the probe surface and a living cell sample. The adhesion force derived from the potential gradient was incorporated to the Hertz relation, from which value of sample the the elastic modulus of the is obtained.

Our result show that during indentation of the intact cell, the adhesion force increases in proportion to the indentation depth. The increase in the slope of the force-indentation curves predicts a higher Young's modulus than the value obtained by the Hertz model neglecting adhesion force by up to 25% for decreasing size of molecules coating the probe. The model predicts the Young's modulus of a cell based on the radius of the probe, and the size

and concentration of the molecules coating the surface. Thus, our approach provides precision on cell mechanics measurements without neglecting surface interactions that could be incorrectly neglected. (Author's abstract)

Keywords: Physics, Young's modulus, Hertz model, Lennard-Jones potential, Elastic force, Force-indentation curve

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 173 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

#### 0525

### Effect of cesium seeding on the production of H<sup>â€</sup> ions in a magnetized sheet plasma source *Villorente, L. M. M., Noguera, V. R., Ramos, H. J.*

The effect of the addition of cesium on the production of negative hydrogen ions  $(H^{\hat{a}e^*})$  in a magnetized sheet plasma source (SPNIS) is investigated. Plasma parameters and  $H^{\hat{a}e^*}$  yields were determined from Langmuir probe and **E** x **B** probe measurements, respectively. Significant increase on  $H^{\hat{a}e^*}$  yield is observed with the addition of a controlled flux of neutral Cs vapor. The maximum enhancement of 88 times compared with the uncesiated case is extracted at 5 cm away from the sheet plasma core at a discharge current of 0.5 A and initial gas filling pressure of 9 mTorr. The value is increased from 5.51 x 10-8 Alm2 for the uncesiated case to 4.86 x  $10^{-6}$  A/m<sup>2</sup> for the cesiated case. The largest negative hydrogen ion current density extracted is 0.0155 A/m<sup>2</sup> at 2.5 A discharge current, 9 mTorr initial gas filling pressure, and 1 cm probe distance from the plasma center. Here, enhancement is only 9.8 times compared with pure hydrogen discharge. The increase in H- current density is attributed mainly to the cooling effect of Cs as evidenced by the considerable decrease in electron temperature especially at the periphery of the plasma. (**Author's abstract**)

Keywords: Physics, Hydrogen ions, Plasma, Cesium

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 90-94 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

0526

#### Effect of filter arrangement in the estimation accuracy of an imaging spectrometer Oblefias, Wilma R., Soriano, Maricor N., Saloma, Caesar A.

We investigate the reason why increasing the number of basis spectra in a spectral imaging device does not always improve the estimation merit. A particular filter is not the cause of this observation but the components of the inverse of the transformation matrix which map the coefficient of the basis spectra to the color of the sample. We found out that the large magnitude of the components of the inverse of the transformation matrix result in error in the calculation of the coefficients. This error leads to a drop in the spectral estimation merit even when the number of basis spectra is increased. Therefore, it is not enough that the filter used in an imaging spectrometer is not a linear multiple of other filters and nonzero to any of the wavelengths in the range of interest. Filters must also be arranged in a sequence such that the inverse of the transformation matrix will have components with small magnitude. (Author's abstract)

Keywords: Physics, Transformation matrix, Filters, Wavelengths

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 84-88 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

#### Effect of training on attitude formation towards nuclear science and technology Asuncion, Alvie J., Loterina, Roel A., Cansino, Percedita T.

Nuclear energy's critical role in sustainable development has been highlighted in various reports and studies. This role, however, has been hampered by many influences; one of the most notable is public support which has been correlated with public attitudes. Public support drops rapidly in the midst of nuclear crises as in the case of the recent Fukushima accident, and unless interventions are made, this drop can become irreversible. Information dissemination and brief public communication may serve as short-term solutions, but these interventions appeal to opinions which are relatively more volatile than attitudes. Previous studies have shown that there are different pathways to attitude formation which include education and knowledge-building activities. In this study, the effect of training to the attitudes of participants towards nuclear science and technology was investigated. A questionnaire was designed and validated to measure attitudes towards Nuclear Science and Technology (NST) and was administered to participants of training courses conducted by the PNRI Nuclear Training Center. A total of 111 participants from five training courses were included as respondents which is 91 % of the target population, of these, 30.6% are Educators, 44.1 % are Medical Practitioners, and 25.2% are Licensees. Mean scores obtained from the questionnaire were analyzed and significant difference has been found at 0.05 confidence level, between participants' attitudes before and after attending a training course. There were slight differences observed from each group of respondents but over-all results show that knowledge-building activities like trainings can be utilized to improve public attitudes towards nuclear science and technology in the Philippine context. (Author's abstract)

Keywords: Physics, Public attitudes, Nuclear training, Nuclear science and technology

Philippine Nuclear Journal, Volume No. Issue No., 58-65 (Filipiniana Analytics) Fil(S) QC173 P55 v.16 2011

# Effect of wall material on H<sup>â€</sup> production in a plasma sputter-type ion source *Ponce, Y. D. M., Lazarte, J. R. S., Ramos, H. J.*

The effect of wall material on negative hydrogen ion ( $H^{\hat{a}}^{\mathfrak{C}}$ ) production was investigated in a multicusp plasma sputter-type ion source (PSTIS). Steady-state cesium-seeded hydrogen plasma was generated by a tungsten filament, while H- was produced through surface production using a molybdenum sputter target. Plasma parameters and  $H^{\hat{a}}^{\mathfrak{C}}$ yields were determined from Langmuir probe and Faraday cup measurements, respectively. At an input hydrogen pressure of 1.2 m Torr and optimum plasma discharge parameters  $V_d = \hat{a} \mathfrak{C}$  90 V and  $I_d = \hat{a} \mathfrak{C}$  2.25 A, the plasma parameters  $n_e$  was highest and  $T_{\cdot e}$  was lowest as determined from Langmuir probe measurements. At these conditions, aluminum generates the highest ion current density of 0.01697 mA/cm<sup>2</sup>, which is 64% more than the 0.01085 mA/cm<sup>2</sup> that stainless steel produces. The yield of copper, meanwhile, falls between the two materials at 0.01164 mA/cm<sup>2</sup>. The beam is maximum at  $V_t = \hat{a} \mathfrak{C}$  125 V. Focusing is achieved at  $V_L = \hat{a} \mathfrak{C}$  70 V for stainless steel,  $V_t = \hat{a} \in 60$  V for aluminum, and  $V_t = \hat{a} \in 50$  V for copper. The results demonstrate that proper selection of wall material can greatly enhance the H<sup> $\hat{a} \in 0$ </sup> production of the PSTIS. (**Author's abstract**)

Keywords: Physics, Plasma, H- production, Plasma sputter-type ion source (PSTIS), Hydrogen ion

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 52-56 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

0529

### Electron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Off-axis substrates

Guiao, L., Sarmiento, R., Somintac, A., Agra, F., Salvador, A.

Deep level transient spectroscopy (DLTS) was used to characterize the electron traps present in the bulk GaAs grown by molecular beam epitaxy (MBE) on on-axis (100) and off-axis (4° towards the (111) A direction) substrates. Two electron traps were obtained for each sample having identical corresponding peak locations in the DLTS spectra. The layer grown on the on-axis substrate has electron traps with activation energies of  $E_c$ -0.454 eV and  $E_c$ - 0.643 eV and capture cross-sections of 1.205 x 10<sup>-14</sup> cm<sup>2</sup> and 3.88 x 10<sup>-15</sup> cm<sup>2</sup>, respectively. The layer grown on the off-axis substrate has traps with activation energies of  $E_c$ -0.454 eV and  $E_c$ -0.454 eV and capture cross-sections of 2.060 x 10<sup>-14</sup> cm<sup>2</sup> and 4.40 x 10<sup>-14</sup> cm<sup>2</sup>. The electron traps are possibly the M4 (or EL3) and EL2 (or EB4) traps commonly found in GaAs layers. Due to the high trap concentrations obtained and to the non-uni form trap concentration profile, As desorption may be considerable during growth. (Author's abstract)

Keywords: Physics, Deep level transient spectroscopy (DLTS), GaAs, Molecular beam epitaxy

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 15 Issue No. 1, 6-10 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

0530

#### Enhancement of Fe magnetic moments in Fe/Co (001) multilayers Morales, Marienette B., Villagonzalo, Cristine R.

In order to investigate the electronic and magnetic properties of a bcc Fe/Co (001) multilayer, we have performed electronic structure calculations employing the total energy full-potential linear muffin tin orbital method. The magnetic moments of the layers are calculated. Based on these results, the magnetization profiles and the microscopic origin of the enhancement of Fe moments in the multilayers of the same Co content but with different interface qualities are reported. Large enhancement of magnetic moment is observed in the Fe monolayer located at the interface, and an even greater increase is obtained for the multilayer with one monolayer of intermixing between Fe and Co layers. The Co atoms were found to have similar magnetic moments in the bulk and at the interface. (Author's abstract)

Keywords: Physics, Fe layer, Co layer, Fe/Co (001) multilayers

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 6-7 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

#### Experimental verification of the allelomimesis clustering model Juanico, Dranreb Earl, Saloma, Caesar

The allelomimesis clustering model is based on only two parameters  $\hat{I} \pm$  and p, which represent the probability of nearest-neighbor copying and the fraction of unresponsive agents, respectively. The model results into the formation of clusters of agents, the sizes of which obey a distribution that is determined by the values of  $\hat{I} \pm$  and p. Several experimental data are fitted by tuning the two parameters. In particular, the significance of the value of  $\hat{I} \pm$  that corresponds to an experimental data is discussed and justified according to ecological context. Recommendations for possible extensions of the model are also enumerated. (Author's abstract)

Keywords: Physics, Allelomimesis clustering, Parameters, Power law

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 36-40 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

#### Femtosecond pulse propagation in a highly nonlinear photonic crystal fiber Gabayno, J. F., Alonzo, C. A., Garcia, W. O.

Femtosecond pulses are launched into a highly nonlinear photonic crystal fiber (PCF). The input and output spectra were measured using a monochromator and streak camera. The spectrum of the output from a 50 cm PCF pumped at 794 nm for different pump powers features asymmetric side lobes due to intrapulse Raman scattering. Similar measurements on a 100 cm PCF pumped at 795 nm highlight the appearance of blueshifted peaks as a result of energy transfer of solitons to dispersive waves. Broadening in the spectrum is observed and attributed to Raman-scattering-induced soliton self-frequency shift. Spectrograms of both input and output pulses into a 50 cm PCF are captured using a streak camera. The spectrum reveals that individual modes observed on the spectrogram are actually a decomposition of the input pulse. (Author's abstract)

Keywords: Physics, Femtosecond pulse propagation, Photonic crystal fiber, Monochromator, Raman scattering

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 66-69 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004 The flux creep process in a *c*-axis  $Bi_2Sr_2CaCu_2O_{8+\delta}$  thin film was investigated at different temperatures and applied fields using the Kim-Anderson (KA) approach. The peaked behavior shown in the magnetoresistance profile was attributed to the competing mechanisms offlux motion and sample-intrinsic transition near  $T_c$ . Within the temperature range where the competition occurs, U increases with temperature and consequently a decrease in the superconducting volume corresponds to a decrease in the flux creep. Moreover, the flux creep potential barrier varies with applied current *I* at all temperatures consistent with the KA model. (Author's abstract)

Keywords: Physics, Flux creep, C-axis, Kim-Anderson (KA) approach, Flux motion

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 26-30 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

0534

#### Frequency conversion of the 355 nm Nd:YAG laser via stimulated raman scattering in hydrogen Palero, J. A., Garcia, W.O.

The third-harmonic 355 nrn output of a pulsed Nd-Y AG laser is converted into UV, VIS, and NIR laser light by stimulated Raman scattering in high pressure hydrogen gas. Laser lines in the 223 to 309 nrn and 416 to 865 nrn spectral regions are generated by anti-Stokes and Stokes Raman shifting, respectively. Experimental results on the energy output, conversion efficiencies, spectral profile, and temporal behavior of the various Stokes and anti-Stokes Raman laser lines are presented. The first and second Stokes shifted wavelength with wavelengths of 416 nm and 503 nrn yielded a maximum energy conversion efficiency of 60.4% and 58.8%, respectively. (Author's abstract)

Keywords: Physics, Stimulated raman scattering, Raman shifting, Frequency conversion.

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 13 Issue No. 1, 66-72 (Filipiniana Analytics) Fil(S) Q1.A3 S4 13/1 2001

0535

#### Gradient and scattering forces on a Kerr Nanosphere Pobre, R. F., Saloma, C. A.

A theoretical model that computes both for the gradient and scattering forces being exerted on a nonresonant nonlinear (electro-optic Kerr effect) rigid nanosphere by a strongly focused continuous-wave laser beam is presented. The incident wavelength of the laser beam is assumed to be appreciably larger than the nanosphere radius *a*. Optical forces arising from the aforesaid interaction can be derived by a two component approach which determines individually the gradient force and scattering force. The behavior of the trapping (gradient) force is plotted against several experimental parameters, e.g., incident beam power, axial distance, sphere radius, wavelength, and refractive index difference between the surrounding liquid and the nanosphere. Results have shown that the Kerr effect on the nanosphere can produce a maximum of tenfold increase in the trapping force. (Author's abstract)

Keywords: Physics, Gradient, Scattering forces, Kerr Nanosphere

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 106-109 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

# Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular beam epitaxy

Somintac, A. S., Estacio, E., Bailon, M. F., Salvador, A. A.

High intensity and sharp emission peaks, at light-hole (842 nm) and heavy-hole (857 nm) excitonic transitions for a 90  $\tilde{A}$ ... GaAs quantum well (QW) were observed for vertical-cavity surface-emitting laser (VCSEL) structure. Excellent wavelength selectivity and sensitivity were demonstrated by resonant cavity enhanced (RCE) photo detector at 859 nm, corresponding to the energy level of a 95  $\tilde{A}$ ... GaAs quantum well. (Author's abstract)

Keywords: Physics, GaAs, VCSEL/RCE, Optoelectronic applications, Molecular beam epitaxy

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 15 Issue No. 1, 1-5 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

#### High-order correlation functions and correlation dimensions of chaotic systems without noise and chaotic systems with noise *Tarroja, Manuela Fe H., Sicam, Victor Arni*

An aperiodic temporal behavior and the corresponding broadband power spectrum characterize chaotic systems. However, stochastic noises have similar properties and hence the above do not unambiguously identify chaos. In this paper, other properties such as the phase plots, return maps, correlation dimensions, and correlation functions are used to identify signatures of chaos. A period-doubling route to chaos in a xenon laser has been identified using the time series, the power spectrum, the phase plots, and return maps and confirmed by a calculation of the correlation dimension. The effect of smoothing on the dynamical properties of the chaotic signal has also been examined. Our results suggest that at least for the type of noise associated with the detection process, smoothing can unravel fine features of chaos that are usually smeared by the presence of noise. Finally, signatures of chaos have been identified using higher-order correlation functions. **(Author's abstract)** 

Keywords: Physics, Chaotic system, Chaos, Dimension, Power spectrum

NRCP Research Journal, Volume No. 1 Issue No. 1, 50-70 (Filipiniana Analytics) Fil(S) Q179.9 N323 1/1 1992

#### High-resolution differential thermography of semiconductor edifices Sastine, Vera Marie, Cemine, Vernon Julius, Blanca, Carlo Mar, Saloma, Caesar

We develop a cost-effective, high-resolution, and noninvasive imaging technique for thermal mapping of semiconductor edifices in integrated circuits. Initial implementation was done using a power-stabilized optical feedback laser system that detects changes in the optical beam-induced current when the package temperature of the device is increased. The linear change in detected current can be translated to a thermal gradient, which can reveal semiconductor "hotspots"  $\hat{a} \in$  localized sites with anomalous thermal activity. These locales are possible fault sites or areas susceptible to defects, which are the best jump-off points for failure analysis. (Author's abstract)

Keywords: Physics, Thermal mapping, Semiconductor edifices, Optical beam

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 57-60 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

## Influence of stacked Ge islands on the dark current-voltage characteristics of a diode for solar cell application

Alguno, Arnold C., Kirit, Noli Vergel E., Codizar, Jihan D., Dagaerag, Liza-Fe L.

We report on the dark current-voltage (*I-V*) characteristics of the diode with embedded stacked Ge islands in the intrinsic layer for solar cell application. Gas-source molecular beam epitaxy was used to grow the stacked Ge islands on a Si substrate. Two-diode model was utilized to analyze the dark *I-V* characteristics of a solar cell with embedded Ge islands in the intrinsic region. This model describes the relationship between current and voltage of a solar cell with stacked Ge island in the generation region under dark condition. Furthermore, this models is capable of predicting some physically meaningful parameters for the enhancement of solar cell efficiency. Based on this two-diode model, we found out that the minority carrier diffusion and the recombination current components increase when there is an increase on the number of stacked Ge island layers. Moreover, we believe that the increase in minority carrier diffusion current might be due to an increase on the intrinsic carrier density as the number of stacked Ge islands layers increases. Similarly, the increase in the recombination current components might be due to the enormous recombination of carriers in the intrinsic region as the number of stacked layer increases. These results can be used to fabricate a high-efficiency solar cell with embedded stacked Ge islands through efficient separation of electron-hole pairs by the internal electric field and this can contribute to significantly increase the photocurrent without considerable recombination of carriers in the stacked Ge island layers. (Author's abstract)

Keywords: Physics, p-n junction, Two-diode model, Ge islands, Solar cells

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 180 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0540

Initial studies of a microwave-induced atmospheric plasma jet Lacdan, Ma. Camille, Tuballa, Tracy, Ting, Julie Anne, Lee, Jr., Henry V., Rosario, Leo Mendel, Tumlos, Roy, Ramos, Henry This study investigates the dimensions of plasma using a gkW microwave-induced atmospheric plasma jet. The forward power studied ranges from 600W to 1800W for different flow rates. In this experiment, a 9.5cm quartz glass was used . In order to measure the length of the plasma, images of the plasma for different settings were observed using a digital camera 127cm away from the setup. The data is presented as plasma length versus absorbed power. It was shown that the plasma length increased as the absorbed power was increased. It was also observed that the ambient air had an influence on the plasma length. The results of this study are relevant for future optimization studies involving the microwave plasma jet. (Author's abstract)

Keywords: Physics, Atmospheric plasma, Microwave, Plasma jet, Plasma length, Optimization

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 179 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

#### Isotope and geochemical methods in water resources assessment and environmental management Araguas-Araguas, Luis

Nuclear and isotope methodologies in hydrological studies. which have heen developed and improved during the last four decades, provide new powerful tools to hydrologists and civil engineers involved in water resources assessment and management. The discipline "Isotope Hydrology" comprises techniques based on the use of naturally-occurring environmental isotopes and others based on the use of artificial tracers. intentionally injected into water systems being studied. Although most of the techniques and analytical capabilities have been developed by physicists and chemists, many techniques have become an integral part of many hydrological investigations conducted by water scientists. While the conventional techniques in hydrology are largely based on measurement of fluxes, the information provided by isotope and geochemical techniques is derived from the concept of "tracer". Chemical and isotope measurements in natural waters ate used as a means to investigate the origin, movement and evolution of water and dissolved substances in different phases of the water cycle. This approach provides additional information on the dynamics of water and pollutants from a new perspective and helps to better manage water resources. The paper provides a brief overview of the tools and methodologies available to hydrologists and water scientists, as well as the common applications where isotope techniques are used. Emphasis is placed on applications related to new trends and challenges related to man's growing impact on water resources. (Author's abstract)

Keywords: Physics, Nuclear methodologies, Isotope methodologies, Tracer, Isotope hydrology

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No. , 45-55 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

0542

#### Kinetics of non-isothermal crystallization of coconut-based cholesteryl ester: avrami and ozawa approaches Joson, J. F., Davila, L. T., Domingo, Z. B.

Kinetics of non-isothermal crystallization of coconut-based cholesteryl ester was performed by differential scanning calorimetry under various heating rates. Different analysis methods were used to describe the process of non-isothermal crystallization. The results showed that the Avrami equation could describe the system very well. However, the Ozawa analysis failed. A probable reason is the difference in the crystallization kinetics at high and low relative crystallization. The phase transitions of the coconut-based cholesteryl ester were also observed through optical polarizing microscopy. (Author's abstract)

Keywords: Physics, Kinetics, Avrami approach, Ozawa approach, Non-isothermal crystallization

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 51-56 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

0543

#### Learning capability of a silnple neural network Juanico, Dranreb Earl, Monterola, Christopher, Saloma, Caesar

We demonstrate that a neural network composed of only three nodes and three connections arranged in a 2inputs, 1-middle, 1-output architecture is able to perform differentiation of univariate functions (D). Using a proposed empirical technique, we assess the network's generalization capability by approximating a functional form for the growth function  $\hat{a}^{\dagger}_{F}(N)$ . We calculated the probability of error to be  $\approx 10^{-7}$  allowing us to justify the effectiveness of the simplistic approach in modeling a non-trivial task such as D. (Author's abstract)

Keywords: Physics, Architecture, Differentiation, Generalization, Growth function

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 13 Issue No. 2, 55-57 (Filipiniana Analytics) Fil(S) Q1.A3 S4 13/2 2001

0544

### Localization and imaging of integrated circuit defect using simple optical feedback detection

#### Cemine, Vernon Julius, Buenaobra, Bernardino, Blanca, Carlo Mar, Saloma, Caesar

High-contrast microscopy of semiconductor and metal edifices in integrated circuits is demonstrated by combining laser-scanning confocal reflectance microscopy, one-photon optical-beam-induced current (1POBIC) imaging, and optical feedback detection via a commercially available semiconductor laser that also serves as the excitation source. The confocal microscope has a compact in-line arrangement with no external photodetector. Confocal and 1P-OBIC images are obtained simultaneously from the same focused beam that is scanned across the sample plane. Image pairs are processed to generate exclusive high-contrast distributions of the semiconductor, metal, and dielectric sites in a GaAs photodiode array sample. The method is then utilized to demonstrate defect localization and imaging in an integrated circuit. (Author's abstract)

Keywords: Physics, One-photon optical-beam-induced current (I POBIC), Integrated circuits, GaAs

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 47-51 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

#### Low-level color and texture feature extraction of coral reef components Marcos, Ma. Sheila Angeli, Soriano, Maricor, Saloma, Caesar

The purpose of this study is to develop a computer-based classifier that automates coral reef assessment from digitized underwater video. We extract low-level color and texture features from coral images to serve as input to a high-level classifier. Low-level features for color were labeled blue, green, yellow/brown/orange, and gray/white, which are described by the normalized chromaticity histograms of these major colors. The color matching capability of these features was determined through a technique called "Histogram Backprojection". The low-level texture feature marks a region as coarse or fine depending on the gray-level variance of the region. (Author's abstract)

Keywords: Physics, Coral reef, Histogram backprojection, Benthos

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 45-50 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

#### Measurement of the temperature of rubidium atoms in a magneto-optical trap Liwag, J. W. F., Sicam, V. A., Karremans, K.

We have performed measurements that can be used to determine the temperature of rubidium atoms in a magneto-optical trap. The expansion of the atomic cloud after switching off the current through the anti-Helmholtz coi Is was recorded with a CCD camera. Analysis of the measurements revealed that the cloud of atoms in optical molasses expands at a velocity of 4 cm/s. (Author's abstract)

Keywords: Physics, Rubidium atoms, Magneto-optical trap, Anti-Helmholtz coils, Atomic cloud, Atoms

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 22-26 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

### Measurement of three-dimensional deformations by phase-shifting digital holographic interferometry

Almoro, Percival F., Cadatal, Marilou M., Daza, Marlon Rosendo H.

Out-of-plane deformations of a cantilever were measured using phase-shifting digital holographic interferometry (PSDHI) and the Fourier transform method (FTM). The cantilever was recorded in two different states, and holograms were stored electronically with a charge-coupled device (CCD) camera. When the holograms are superimposed and reconstructed jointly, a holographic interferogram results. The three-dimensional (3D) surface deformations were successfully visualized by applying FTM to holographic interferogram analysis. The minimum surface displacement measured was  $0.317 \,\mu$ m. The processing time for the digital reconstruction and visualization of 3D deformation took about I minute. The technique was calibrated using Michelson interferometry setup. (Author's abstract)

**Keywords:** Physics, Phase-shifting digital holographic interferometry (PSDHI), Fourier transform method (FTM), Charge-coupled device (CCD), Surface deformations

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 32-36 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

#### Micro-holograms in a methyl red-doped polymer-dispersed liquid crystal (E48:PVP) Hermosa, II, N. P., Daza, M. R. H.

Feasibility of a holographic point-by-point storage in a methyl red-doped Polymer-Dispersed Liquid Crystal (PDLC) is determined. Micro-holograms (gratings) are recorded next to each other. Smallest grating diameter obtained is 69.9 mm, with minimum grating distance of 80 mm. Recording of adjacent grating reduces the diffraction efficiency of existing grating by 17% (average). (Author's abstract)

Keywords: Physics, Micro-holograms, Polymer-dispersed liquid crystal (PDLC), Methyl red-doped

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 93-96 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

0549

#### A Monte Carlo simulation study on the interactions of proton, 7Li and 12C with water for hadron therapy application

Maratas, Jan Mickelle V., Morente, Carlo Paul P., Nawang, Salasa A.

The interactions of <sup>12</sup>C, <sup>7</sup>LI and protons were simulated using a tissue reference media (water). The primary focus is to investigate the nuclear fragmentation which is believed to be the cause of the so-called dose-tail located right after the Bragg peak structure, which might affect the healthy neighboring tissue of the tumor.

Using Monte Carlo Method in GEANT4 (GEometry ANd Tracking 4<sup>th</sup> incarnation) toolkit, a pencil-like beam profile with Gaussian energy distribution is directed towards a box-shaped water target. Mean energies ranging from 100 MeV to 400 MeV for <sup>12</sup>C, 100 MeV to 250 MeV for the <sup>7</sup>Li, and 50 to 250 MeV for protons were used. Electromagnetic (EM) interactions are described by the standard and low-energy EM models, while the nuclear fragmentation interactions are described by the Hadronic interaction models such as the Binary cascade and Statistical Multifragmentation Models. Information such as Depth dose profile and peak to entrance ratio were

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simulation.

The results show that the peak-to-entrance ratio was lower at higher mean energies for the three projectiles. At 400 MeV the peak-to-entrance ratio was about 3.425 for <sup>12</sup>C. At 250 MeV the peak-to-entrance ratio were 3.615 and 2.514 for protons and <sup>7</sup>Li, respectively. These peak-to-entrance values are approximately half of the highest known value of 12C at 175 MeV. Unlike protons, <sup>12</sup>C and <sup>7</sup>Li produced a larger dose tail with <sup>7</sup>Li lower by 37.88% than <sup>12</sup>C at 170 mm range. Results suggest that for the three projectiles it is <sup>7</sup>Li which are most suitable for therapeutic radiation therapy since it has lower dose tail compared to <sup>12</sup>C and a more enhanced peak-to-entrance ratio compared to proton. (Author's abstract)

**Keywords:** Physics, Hadron radiation therapy, Nuclear fragmentation, Dose tail, Peak-to-entrance ratio, Bragg peak

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 183 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

#### A multicultural teaching framework for physics Carreon, S. L. M.

This paper presents a framework for integrating varying cultural elements in the teaching of physics concepts. The framework is based on a study on the effects of a multicultural physics teaching approach on student concept understanding and attitude towards physics. (Author's abstract)

Keywords: Physics, UNESCO, DepEd, Culture-Responsive Curriculum for Indigenous Peoples (CCIP)

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 17-21 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

0551

#### National indoor radon survey in Filipino homes

#### dela Cruz, Fe M., Garcia, Teofilo Y., Palad, Lorna Jean H., Cobar, Ma. Lucia C., Duran, Emerenciana B.

This paper presents the results of the first national survey of indoor radon concentrations in different types of Filipino houses throughout the Philippines. Measurements were carried out using 2,626 CR-39 alpha track detectors that were deployed in selected houses for a period of six months. Results of analyses showed that indoor radon concentration in Filipino houses ranged from 1.4 to 57.6 Bq/m<sup>3</sup> with a mean value of  $21.4 \pm 9.2$  Bq/m<sup>3</sup>. This leads to an estimated annual average effective dose equivalent of 0.4 mSv. There are slight differences in the mean concentrations

radon in different types of houses, which ranged from 19.4 to 25.3 Bq/m<sup>3</sup>. Highest mean radon concentrations were observed in houses made of concrete with a mean radon value of  $25.3 \pm 10.1$  Bq/m<sup>3</sup>. Radon concentrations in the houses surveyed were below the action limits of 200 Bq/m<sup>3</sup> set by the National Radiological Protection Board (NRPB) and do not pose any hazard to the health of the occupants. (Author's abstract)

Keywords: Physics, Indoor radon concentration, Radon survey, Filipino homes

Philippine Nuclear Journal, Volume No. Issue No., 9-16 (Filipiniana Analytics) Fil(S) QC173 P55 v.17 2012

#### 0552

#### A Nd:YAG laser-pumped hydrogen raman shifter with capillary waveguide Torres, Maria Leilani Y., Cadatal, Marilou M., Garcia, Wilson O.

Operation of a 355/532 run Nd:YAG laser-pumped hydrogen Raman shifter with capillary waveguide (CWG) is demonstrated. For both pump wavelengths, more laser lines are generated using the Raman shifter with CWG compared to a conventional Raman shifter. Both 355 and 532 run pumps showed a 60% decrease in threshold power for the generated first Stokes (SI) Laser line. The 355 run-pumped Raman shifter with CWG generated Slat 2.1 m W pump power at a hydrogen pressure of 1.38 MPa. On the other hand, for the 532 run pumped waveguide Raman shifter at a hydrogen pressure of 1.72 MPa, the threshold power for SI is at 8.3 mW. In addition, an improvement of the output powers is observed for the Stokes and anti-Stokes generated by Raman shifter with CWG. (Author's abstract)

Keywords: Physics, Waveguide, Stimulated raman scattering, Nd:YAG

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 17 Issue No. 1, 37-46 (Filipiniana Analytics) Fil(S) Q1.A3 S4 17/1 2005

0553

#### Near-IR spectral imaging of semiconductor absorption sites in integrated circuits Samson, E. C., Blanca, C. M., Saloma, C.

We derive spectral maps of absorption sites in integrated circuits (ICs) by varying the wavelength of the optical probe within the near-IR range. This method has allowed us to improve the contrast of the acquired images by revealing structures that have a different optical absorption from neighboring sites. A false color composite image from those acquired at different wavelengths is generated from which the response of each semiconductor structure can be deduced. With the aid of the spectral maps, nonuniform absorption was also observed in a semiconductor structure located near an electrical overstress defect. This method may prove important in failure analysis of ICs by uncovering areas exhibiting anomalous absorption, which could improve localization of defective edifices in the semiconductor parts of the microchip. (Author's abstract)

Keywords: Physics, Integrated circuits (ICs), IR range, Microchip

#### Nuclear science and technology: perspectives and prospects for Philippine development Aleta, Carlito R.

The paper provides some historical perspectives on nuclear energy utilization and development in the Philippines. Highlights on applications in agriculture, medicine, industry, environment and on regulations are mentioned.

Current activities include gamma sterilization, food irradiation, sterile insect technique for pest eradication, medical applications, isotope techniques, radiation protection activities and nuclear power.

Prospective contribution to national development through the use of radiation and nuclear techniques include those for water resources assessment, environmental and pollution studies, electricity generation and nuclear desalination.

The regulatory aspects in support of the nuclear energy development are also discussed (Author's abstract)

**Keywords:** Physics, Gamma sterilization, Food irradiation, Isotope techniques, Radiation protection activities, Nuclear power

Challenges of Nuclear Technology for the 21st Century, Volume No. Issue No. , 27-38 (Filipiniana Analytics) Fil(B) QC791.9 P942 1996

#### Numerical investigation of non-homologous collapse of the one-dimensional gravitational gas Gargar, Kim, Esguerra, Jose Perico

In this paper, the one-dimensional gravitational gas is evolved numerically using an event driven code. Two in iti al conditions are considered: (I) an in itially uniform isolated system with no velocity dispersion and where the initial velocities are sine functions of the position, and (2) two "clusters" with initially constant phase-space densities in elliptical regions of phase space. (Author's abstract)

Keywords: Physics, Event driven code, Velocity, One-dimensional gravitational gas

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 80-83 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

0556

### Observation of the quantum-confined stark effect in a GaAs/A1GaAs P-I-N Diode by room temperature photocurrent spectroscopy

Ison, C. S., Estacio, E. S., Bailon, M. F., Salvador, A. A.

Room temperature photocurrent spectroscopy is performed on an MBE-grown GaAs/A1GaAs MQW p-i-n device. An observed shift to longer wavelengths is seen with increasing reverse bias voltages. This behavior is explained through a mechanism called the Quantum-Confined Stark Effect. Applied electric fields are estimated using second-order correction for infinite quantum well s. The estimated built-in electric field is 20 kV/cm corresponding to a 9-meV shift from the flatband energy transition. An observed shift to shorter wavelengths is seen under an optically applied field for both biased and unbiased conditions. (Author's abstract)

Keywords: Physics, GaAs/A1GaAs, P-I-N diode, Quantum-confined stark effect

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 88-92 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

0557

#### Occupational exposure to radon in non-uranium underground mines in the Philippines Garcia, Teofilo Y., dela Cruz, Fe M., Enriquez, Eliza B., Margate, Dante E., Duran, Emerenciana B.

One of the occupational risks of mining ore results from the exposures of miners to radon gas, a radioactive gas that occurs naturally in rocks and soils. The inhalation of this radionuclide constitutes the most important occupational exposure in uranium mines, as well as in non-uranium underground mines and underground work places where ventilation is insufficient. In the Philippines, nine underground metallurgical and coal mines where monitored for radon. Data shows that the activity concentrations of radon in these mines ranged from 30 to 347Bq/m<sup>3</sup>. The annual average potential alpha energy exposure of workers in the mines ranged from 0.02 to 0.06 WLM. These values correspond to an annual effective dose equivalent of 0.15 to 0.5 mSv, respectively. It was found that the levels of radon in Philippine underground mines were below the action level (1000 Bq/m<sup>3</sup>) set by the International Commission on Radiological Protection (ICRP) and were below the levels of human health concerns. (Author's abstract)

Keywords: Physics, Radon gas, CR-39 radon detectors, Radon in mines, Occupational exposure in mines

Philippine Nuclear Journal, Volume No. Issue No., 1-6 (Filipiniana Analytics) Fil(S) QC173 P55 v.16 2011

#### Onset of small-world behavior in topologically evolving networks Juanico, D. E., Monterola, C. P., Saloma, C. A.

We evolve topology of a network of *N* fully-coupled nodes that interact according to repulsion-attraction dynamics within a confining wall. The dynamics portrays each node's tendency to keep distance from its competitors while maintaining a lighter tendency to resist relative isolation. Each node is characterized by two parameters: an intrinsic mobility  $\mu$  and a preferred neighboring distance *p*. Onset of clustering is found to occur at a critical variance in mobility,  $If_{\mu}^2 = 1$ , and in preferred neighboring distance,  $If_{\mu}^2 = 10$ . This result implies that small-world behavior manifested in clustering can be triggered by the diversity of node population. (Author's abstract)

Keywords: Physics, Topology, Dynamics, Parameters

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 37-40 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

#### Onset of turbulence in planar and circular pipe *Jirkovsky, L., Bo-ot, L.*

A third-order hydrodynamic equation with a molecular structure parameter, obtained through a projection and perturbation formalism from the Liouville equation is applied to circular and planar Poisseuille-Hagen flow. It is shown that there is no principal difference in the resulting parabolic velocity profiles as long as the flows remain laminar. However, a difference is noted in the onset of turbulence in consistency with observations, showing larger stability of the parabolic velocity profile in circular pipe. (Author's abstract)

Keywords: Physics, Hydrodynamic equation, Liouville equation, Turbulence, Planar, Circular pipe

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 15 Issue No. 1, 17-21 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

#### An optical remote sensing system based on molecular absorption spectroscopy: I. optical arrangement *Alarcon, Minella C.*

The objective of this project was to set up the optical arrangement for a remote sensing system based on the differential absorption method. Due to unforeseen problems in the acquisition of the principal components mostly from foreign sources, the long-path monitoring technique was based instead on molecular absorption spectroscopy. The absorption cell and the optical mounts have been locally constructed. Initial optical alignment of the system has been done which includes the coupling of the optical fiber with the light source, the sample cell, and the spectrometer. However, optimum alignment is still to be achieved because the sample cell has defective windows and some holders have to be redone to be able to obtain accurate x-y adjustments. (Author's abstract)

Keywords: Physics, Remote sensing system, Absorption method, Optical fiber, Spectrometer

NRCP Research Journal, Volume No. 1 Issue No. 1, 71-75 (Filipiniana Analytics) Fil(S) Q179.9 N323 1/1 1992

#### Optical-feedback semiconductor laser Michelson interferometer Rodrigo, Peter John, Lim, May, Saloma, Caesar

An optical-feedback semiconductor laser Michelson interferometer (OSMI) is presented for measuring microscopic linear displacements without ambiguity in the direction of motion. The two waves from the interferometer arms, one from the reference mirror and the other from the reflecting moving target, are fed back to the lasing medium ( $\lambda = 830$  nm), causing variations in the laser output power. We model the OSMI into an equivalent Fabry-Perot resonator and derive the dependence of output power on path difference between the two interferometer arms. Numerical and experimental results obtain output power that varies periodically (period =  $\lambda/2$ ) with path difference. The output power variation exhibits an asymmetric behavior with the direction of motion , which is utilized to measure the amplitude of vibration of (1) a piezoelectric transducer (PZT) and (2) an audio speaker with directional discrimination. (Author's abstract)

Keywords: Physics, Optical-feedback semiconductor laser Michelson interferometer, Microscopic linear displacements, Fabry-Perot resonator

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 13 Issue No. 2, 89-91 (Filipiniana Analytics) Fil(S) Q1.A3 S4 13/2 2001

0562

# Optimized extraction of H<sup>â€</sup> by three-electrode faraday cup system in magnetized sheet plasma ion source *Fernandez, M. S., Ramos, H. J.*

A locally designed rectangular parallelepiped, three-electrode Faraday cup system has been developed. Its design incorporates the capability of simultaneous extraction and deposition of the H- ions on substrates. The device functions to attain prescribed selectivity conditions of extracted ions, with controlled energies, for deposition or adsorption. It has been proven to detect the ions at filter bias voltage of 13.61 V with a current density of 5.3 A/m2 that is relatively higher than reported (Abate & Ramos, 2000). (Author's abstract)

Keywords: Physics, H- ions, Deposition, Adsorption

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 66-70 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

0563

#### Profile analysis of hydrogenic helium ions in a magnetized sheet plasma Blantocas, Gene Q., Ramos, Henry J.

The profile of hydrogenic helium ions in a magnetized sheet plasma was analyzed vis-a-vis the Collisiona Radiative (CR) model. Strong correspondence exists between experiment and theory, a significant portion of the characteristics of these singly-charged helium ions have been captured by the CR model. The features of the CR model can be aptly ascribed to a pure helium sheet plasma. (Author's abstract)

Keywords: Physics, Hydrogenic helium ions, Plasma, Collisional radiative (CR)

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 61-65 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

0564

#### Radiation-modified natural polymers for biomedical applications dela Rosa, Alumanda M., Abad, Lucille V., Relleve, Lorna S., Aranilla, Charito T., Pascual, Cristina L.

<sup>60</sup>Co gamma radiation was employed to induce crosslinking in natural polymers. Irradiation of natural rubber latex in the presence of n-butyl acrylate (nBA) as sensitizer, resulted in the crosslinking of rubber molecules to form radiation-vulcanized natural rubber latex (RVNRL). The radiation-induced crosslinking is dependent on radiation dose and concentration of nBA. RVNRL may be used in the preparation of dipped latex products.

А hydrogel blend from kappa-carrageenan (KC) polyethylene oxide (PEO) and via radiation crosslinking was prepared. Blending of KC with low molecular weight (LPEO) resulted molecular weight polyethylene oxide (MPEO) composite and medium in а hydrogel system with better properties in terms of gel 'content, gel strength and swelling properties. The hydrogel blends may be developed into a topical wound dressing, a matrix for controlled release system, and for immobilization of cell, enzymes and antibodies. (Author's abstract)

**Keywords:** Physics, 60Co gamma radiation, n-butyl acrylate (nBA), Radiation-vulcanized natural rubber latex (RVNRL), Kappa-carrageenan (KC), Polyethylene oxide (PEO)

Advance Polymers for the 21st Century: proceedings of the DOST-JSPS workshop on materials and polymer chemistry, Volume No. Issue No. , 41-52 (Filipiniana Analytics) Fil(B) QD380 A95 1998

0565

#### Rectifying behavior of PPy/n-Si heterojunctions Manzano, Ma. Carla, Quiroga, Reuben

Sandwich type heterojunctions of n-type silicon and p-type conductive polymer polypyrrole were fabricated and I-Vcharacteristics characterized. The of the PPy/n-Si junctions exhibited rectifying behavior and were found to fit well with the ideal diode equation, except that the ideality factors were anomalously high. Barrier heights were found to be in the range 0.74 to 0.77 eV. The junctions were also found to be unstable in progressively air. with the I-Vcharacteristics exhibiting hysteresis and deteriorating with increasing time of exposure to air at room temperature under normal atmospheric conditions. (Author's abstract)

Keywords: Physics, PPy/n-Si heterojunctions, n-type silicon, p-type conductive polymer polypyrrole

Advance Polymers for the 21st Century: proceedings of the DOST-JSPS workshop on materials and polymer chemistry, Volume No. Issue No. , 67-74 (Filipiniana Analytics) Fil(B) QD380 A95 1998

Correlation measures based on embedded probe fluctuations, are now widely used for characterizing viscoelastic properties of biological samples. However, novel applications using this robust tool are still lacking, considering that the study of living matter routinely demonstrate new phenomena, not immediately characterized by usual quantitative tools. Therefore, we derived new experimental and theoretical approaches to adapt ways of probing non-linear and non-equilibrium phenomena for biological samples.

Optical tweezer systems, two-beam tandems using dual-wavelength and single-wavelength splitting, were designed for high resolution microrheology in bulk down to single biopolymer or protein, based on the fluctuation spectra of embedded or attached probes. We derived calculations for winding turn probabilities to account for unfolding events in single fibrous biopolymers and globular proteins under tensile stretching based on approximating the ensuing probe fluctuations as originating from a damped harmonic oscillator under oscillatory forcing, Furthermore, for networks of biopolymers and living cells, we designed experiments using force pulses for simulating non-equilibrium phenomena, which naturally incorporates non-linear mechanics. The tools developed in this study will probe elastic properties of single biopolymers and networks, as well as living cells, aimed to gain insights for creating low-cost technologies for industrial and medical applications. (Author's abstract)

Keywords: Physics, Biophysics, Microrheology, Biopolymers, Cell mechanics, Biomechanics, Protein folding, Nonequilibrium phenomena

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 174 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0567

### Sensitivity of radiation monitoring systems in Manila Ports in detecting contamination in foodstuff shipments

#### Romallosa, Kristine Marie D., Caseria, Estrella S., Piquero, Ronald E., Agustin, Jan Aldrich A.

During the Fukushima Nuclear Power Plant accident in Japan, one of the Philippines' measures to protect the public from the radiological hazards of the accident is by monitoring agricultural and food imports for radioactive contamination. In this study, the sensitivity of the mobile Radiation Monitoring System (RMS) in Manila Ports in detecting contamination in incoming foodstuff shipments was determined. Large volume synthetic <sup>137</sup>Cs reference sources were used to determine the minimum detectable concentration (MDC) of the RMS. The reference sources have radioactivity concentrations that are comparable to the PNRI guidance level of 1000 Bg/kg for <sup>137</sup>Cs that is destined for general consumption. Results of the MDC measurements show that the RMS units are sensitive enough to detect radioactivity levels that are within the guidance levels provided that a) the minimum package lot is approximately 200 kg, b) the package is positioned at the detector side, and c) the alarm setting of the RMS is as

calibrated. It was therefore established that the RMS can be used to initially screen incoming foodstuff shipments of possible contamination and thereby help minimize potential radiation exposures to the public. (Author's abstract)

**Keywords:** Physics, Minimum detectable concentrations, Radiation monitoring, 137Cs reference source, Radiation measurements, Foodstuff contamination

Philippine Nuclear Journal, Volume No. Issue No. , 51-57 (Filipiniana Analytics) Fil(S) QC173 P55 v.16 2011

0568

### Simultaneous ground-based observations of electric and magnetic field variation near the magnetic equator for space weather study

#### Yumoto, K., Shinohara, M., Nozaki, K., Orosko, E.A., Badillo, Fr. V., Bringas, D., CPMN, WesPac Observation

In order to clarify the global nature of penetration mechanism of DP 2 electric fields from the polar to the dayand night-side equatorial ionospheres, and to understand the solar wind-Earth's magnetosphere coupling as a space weather study, we have carried out simultaneous magnetic and electric field observations using the Frequency Modulated-Continuous Wave (FM-CW) HF radar and the Circum-pan Pacific Magnetometer Network. The DP 2 electric fields caused by the solar wind interaction with the Earth 's magnetic field may be imposed on the polar ionosphere, and the ionospheric DP 2 electric fields are penetrating instantaneously from the polar ionosphere into both the day- and night-side equatorial regIons. (Author's abstract)

**Keywords:** Physics, Magnetic field variation, Magnetic equator, Earth's magnetic field, Frequency modulatedcontinuous wave (FM-CW)

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 13 Issue No. 2, 108-112 (Filipiniana Analytics) Fil(S) Q1.A3 S4 13/2 2001

0569

#### Static behaviors of confined time-arrival operators Bahague, Jr., R. T., Galapon, E. A.

We show that the quantization of the classical Time-of-Arrival (TOA) for arbitrary position X still leads to a class of self-adjoint TOA-operator for a confined particle. The spectrum of the TOA-operator is studied for different cases. (Author's abstract)

Keywords: Physics, Time-of-arrival (TOA), Behavior, Static behavior

### Stretching single molecular DNA by temperature gradient: a white noise functional approach

Maglasang, Gibson T., Gemao, Beverly V., Bornales, Jinky B.

In this study, we obtained the mechanical properties of double stranded DNA (dsDNA) particularly the partition function and extension under small fluctuations limit stretched by temperature gradient field with Wormlike Chain (WLC) as the favored theoretical model. In this model, the dsDNA is treated as a continuous curve chain. The Hida-Streit integral formulation 9White Noise Analysis) is used as a tool in evaluating the partition function of the dsDNA under temperature gradient field because of its versatility and prowess in solving many problems in quantum mechanics as well as in statistical mechanics which includes the system focused in this study. From the partition function, the extension or dsDNA's elastic response through stretching is calculated which turns out to be linearly dependent on the temperature gradient field strength. The result of the calculation shows that temperature gradient can exert force on dsDNA and create internal tension within it which is enough to study and manipulate the biomolecule. (Author's abstract)

Keywords: Physics, Partition function, dsDNA, Wormlike chain model, Temperature gradient, White noise analysis

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 178 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0571

### Study of the perturbation to a bose-einstein gas *Chan, L.*

We developed a new approach to the perturbation theory for the effective Hamiltonian of condensate particles in Fock space. Using this new theory, we can easily analyze the effect of including a somewhat problematic term in the work of Ezawa et al. We thus showed that indeed, the inclusion of this term in the perturbation potential is justified. (Author's abstract)

Keywords: Physics, Perturbation theory, Hamiltonian of condensate particles, Einstein gas

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 71-74 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

0572

#### Surface modified zinc oxide: a potential smoke sensor at ambient condition Piagola, Joy Cristy S., Gambe, Jess E., Vequizo, Reynaldo M.

Zinc oxide (*ZnO*), with its satisfactory stability, has been extensively used as a gas sensor for various gases such as hydrocarbons, oxygen,  $H_2O$ , etc. *ZnO*-based gas sensors are usually operated at > 100°C temperatures which demand more power consumption compared to sensors that can operate at room temperature. To our knowledge, no reports have been presented on the capability of surface of surface modified bulk *ZnO* to sense smoke at ambient

condition. In this study, the smoke sensing properties of HCl-etched ZnO samples in pellet form is presented.

ZnO powders (99%) were pelletized and annealed at 700-1000°C with 100°C increment. Acidic etching using appropriate amount of hydrochloric acid was performed to increase the surface area of the samples. Morphology, electrical and smoke sensing characteristics of the surface modified ZnO pellets were investigated at room temperature (~25°C). Electrical stability of the annealed samples improves as the annealing temperature is increased. All samples have n-type conductivity which is intrinsic for ZnO. Increase in surface area through etching was successfully achieved as seen from their scanning electron microscope (SEM) images. These *HCl*- etched ZnOpellet samples are then referred to as surface modified samples. The surface modified ZnO pellets are more sensitive to smoke than the as-annealed ZnO pellet. The remarkable increase of sensitivity from ~11 to ~2000% is exhibited by the surface modified ZnO pellets annealed at 700°C. These results indicate that ZnO is a potential material for smoke sensing application at ambient. (Author's abstract)

Keywords: Physics, Zinc oxide, Smoke sensor, Annealing, Etching, Sensitivity

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 172 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0573

#### SVD vs PCA : comparison of performance in an imaging spectrometer Oblefias, Wilma R., Soriano, Maricor N., Saloma, Caesar A.

The calculation of basis spectra from a spectral library is an important prerequisite of any compact imaging spectrometer. In this paper, we compare the basis spectra computed by singular-value decomposition (SVD) and principal component analysis (PCA) in terms of estimation performance with respect to resolution, presence of noise, intensity variation, and quantization error. Results show that SVD is robust in intensity variation while PCA is not. However, PCA performs better with signals oflow signal-to-noise ratio. No significant difference is seen between SVD and PCA in terms of resolution and quantization error. **(Author's abstract)** 

**Keywords:** Physics, Singular-value decomposition (SVD), Principal component analysis (PCA), Resolution, Presence of noise, Intensity variation, Quantization error

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 74-78 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

0574

### Synthesis and characterization of A1<sup>+3</sup> doped R<sub>3</sub>Fe<sub>5-x</sub>A1<sub>x</sub>O<sub>12</sub> (R=Dy and Y) iron garnets *Guillermo, Neil Raymund D., Del Castillo, Lorena A., Calix, Virginia S.*

Yttrium (Y) and Dysprosium (Dy) Iron garnets,  $R_3Fe_{5-x}A1_xO_{12}$  (R=Dy and Y) were prepared by oxide sintering method for various values of x. The X-ray diffractograms confirmed that the garnet phase was obtained for all the samples synthesized. The effect of the  $A1^{+3}$  dopant was studied by Mössbauer Effect Spectrometry and the values of the internal magnetic field in the octahedral and tetrahedral sites were measured. (Author's abstract)

Keywords: Physics, Mossbauer spectroscopy, Iron garnets, X-ray diffraction, Yttrium, Dysprosium, Rare earths

Philippine Nuclear Journal, Volume No. Issue No., 27-35 (Filipiniana Analytics) Fil(S) QC173 P55 v.16 2011

#### Synthesis of bulk superconducting magnesium diboride *Olbinado, Margie P., Guerra, Leandro Jose D., Sarmago, Roland V.*

Bulk polycrystalline superconducting magnesium diboride,  $MgB_2$ , samples were successfully prepared via a onestep sintering program at 750°C, in pure Argon with a pressure of 1 atm. Both electrical resistivity and magnetic susceptibility measurements continued the superconductivity of the material at 39K, with a transition width of 5K. The polycrystalline nature, granular morphology, and composition of the sintered bulk material were confumed using X-ray diffractometry (XRD), scanning electron microscopy (SEM), and energy dispersive X-ray analysis (EDX). (Author's abstract)

Keywords: Physics, Magnesium diboride, Synthesis, Superconductivity

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 14 Issue No. 1, 17-20 (Filipiniana Analytics) Fil(S) Q1.A3 S4 14/1 2002

#### Tempering and annealing in a verdier-stockmayer polymer Obias, E. R., Banzon, R. S.

Two Monte Carlo methods, simulated annealing and parallel tempering, were applied to a Verdier-Stockmayer polymer. The efficiency of the two algorithms in exploring the lowest energy state possible for the method polymers was measured by the number of energy-degenerate configurations (configurations that have the same energy but are structurally different). Parallel tempering consistently explored more energy-degenerate configurations as compared with simulated annealing. (Author's abstract)

Keywords: Physics, Verdier-stockmayer polymer, Tempering, Annealing, Monte Carlo method

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 12-16 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

Temporal coherence behavior of a Nd:YAG pumped waveguide raman shifter Garcia, Wilson O., Torres, Maria Leilani Y., Cadatal, Marilou M. We study the behavior and report the control of the temporal coherence length  $z_c$  of a 355/532 nm Nd:YAG pumped H<sub>2</sub> Raman shifter with and without capillary waveguide (CWG). Depending on the application of the Raman-shifter light source,  $z_c$  could be tuned rapidly or slowly by varying the  $H_2$  pressure *P* or the input power P<sub>in</sub>. A more dynamic  $z_c$  behavior is observed for a waveguide Raman shifter. (Author's abstract)

Keywords: Physics, Nd: YAG, Raman shifter, Temporal coherence

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 95-100 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

0578

#### Terahertz-time domain spectroscopic (THz-TDS) measurement of moderately-doped silicon using InAs Emitter under magnetic field Quema, A., Migita, M., Nashima, S., Hangyo, M.

The complex refractive index of silicon using terahertz-time domain spectrocscopy (THz-TDS), with an InAs wafer under the influence of a magnetic field as emitter, has been studied. By applying a magnetic field on the InAs emitter, the detected temporal waveform broadens and the spectral weight of its Fourier spectrum shifts toward the low frequency region. Calculating the real (*n*) and imaginary ( $\kappa$ ) parts of the complex refractive index of silicon, it is found that with the application of a magnetic field the plots of these quantities in the low frequency region (sub-terahertz region) are smoother than those without magnetic field. These features indicate that a significant enhancement of the signal-to-noise (*S/N*) ratio in the low frequency can be obtained by applying a magnetic field on the InAs emitter. (Author's abstract)

Keywords: Physics, Terahertz-time domain spectroscopic (THz-TDS), InAs emitter, Silicon

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 13 Issue No. 2, 41-43 (Filipiniana Analytics) Fil(S) Q1.A3 S4 13/2 2001

0579

### Thermally-activated vortex motion and electrical dissipation in a Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>Î</sub><sup>'</sup> thin film *de la Cruz, C. R., dela Cruz, A. P. C., Guerra, L. J. D., Sarmago, R. V.*

The magnetoresistance, obtained from resistivity measurements with external magnetic fields up to 0.5T, was used to directly measure and investigate the electrical dissipation properties of a c-axis oriented  $Bi_2Sr_2CaCu_2O_{8+1}$ thin film. An activation-related "peaked" profile below  $T_c$  was observed in the magnetoresistance. In increasing applied magnetic field, the peak shifts to lower temperatures, broadens, and becomes more asymmetric. The analysis, made based on an Arrhenius-type activation mechanism, shows that the activation energy decreased with increasing applied magnetic field. as predicted bv the Anderson-Kim Thermally-Activated Flux Creep Theory. Therefore, in these low magnetic fields and temperatures, the vortex motion predominant in the films is thermally activated and contributes largely to the dissipation in these films. (Authors abstract)

Keywords: Physics, C-axis, Vortex motion, Anderson-Kim Thennally-Activated Flux Creep Theory

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 41-44 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

#### Thermodynamics of a one-dimensional gravitational gas in a uniform external field *Caroy, Nelson Y., Esguerra, Jose Perico H.*

We derived exact expressions for the partition function, equation of state, mean internal energy, and heat capacity at constant volume of a one-dimensional gravitational gas (1DGG) in a uniform external field. (Author's abstract)

Keywords: Physics, Thermodynamics, One-dimensional gravitational gas, Statistical mechanics

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 13 Issue No. 2, 71-74 (Filipiniana Analytics) Fil(S) Q1.A3 S4 13/2 2001

0581

### Thin film formation of gallium nitride using plasma-sputter deposition technique *Flauta, R., Kasuya, T., Ohachi, T., Wada, M.*

The formation of gallium nitride (GaN) thin film using plasma-sputter deposition technique has been confirmed. The GaN film deposited on a glass substrate at an optimum plasma condition has shown x-ray diffraction (XRD) peaks at angles corresponding to that of(002) and (10 I) reflections of GaN. The remaining material on the sputtering exhibited XRD reflections corresponding that of bulk GaN powder. target to То improve the system's base pressure, a new UHV compatible system is being developed to minimize the impurities in residual gases during deposition. The sputtering target configuration was altered to allow the monitoring of target temperature using a molybdenum (Mo) holder, which is more stable against Ga amalgam formation than stainless steel. (Author's abstract)

Keywords: Physics, Gallium nitride, Plasma, Plasma-sputter, X-ray diffraction (XRD), Molybdenum (Mo)

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 57-60 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

0582

#### THz radiation from high-Tc superconducting materials and its applications Hangyo, Masanori

Electromagnetic pulses with a time width of less that 0.5 ps are emitted from high-Tc superconductors (HTSC's) by exciting with ultrashort optical pulses. The radiation is observed under various states, i.e., current biased, magnetic field applied, and magnetic flux trapped states. The radiation mechanism is ascribed to the ultrafast modulation of the supercurrent, which is brought about by the optical Cooper pair breaking. This new phenomenon is applied to noncontact supercurrent imaging and an optical flux trap memory. (Author's abstract)

Keywords: Physics, THz radiation, High-Tc superconducting materials, Electromagnetic pulses, Maxwell equations

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 13 Issue No. 2, 7-10 (Filipiniana Analytics) Fil(S) Q1.A3 S4 13/2 2001

0583

#### Time-of-flight measurement of a 355-nm Nd:YAG laser-produced aluminum plasma Baclayon, M. F., Alonzo, C. A., Garcia, W. O.

An aluminum target in air was irradiated by a 355-nm Nd:YAG laser with a pulse width of 10 ns and a repetition rate of 10Hz. The emission spectra of the laser-produced aluminum plasma were investigated with varying distances from the target surface. The results show the presence of a strong continuum very close to the target surface, but as the plasma evolve in space, the continuum gradually disappears and the emitted spectra are dominated by stronger line emissions. The observed plasma species are the neutral and singly ionized aluminum and their speeds were investigated using an optical time-of-flight measurement technique. Results show that the speeds of the plasma species decreases gradually with distance from the target surface. Comparison of the computed speeds of the plasma species shows that the singly ionized species have relatively greater kinetic energy than the neutral species. (Author's abstract)

Keywords: Physics, Nd: YAG laser, Aluminum, Plasma

Science Diliman: a journal of pure and applied sciences, Volume No. 15 Issue No. 1, 27-31 (Filipiniana Analytics) Fil(S) Q1.A3 S4 15/1 2003

0584

#### Tracking the dynamic variations in a social network formed through shared interests *Pedemonte, Gerold, Lim, May*

We tracked the dynamics of a social network formed by a shared interest in movies. Users-, movie ratings-, and rental date-data from the Netflix Prize dataset were used to construct a series of date filtered social networks, wherein viewers were linked when they rented the same movie and gave the same rating. We obtained a nearly constant high clustering coefficient (0.60  $\hat{a} \in 0.85$ ), and a low average path length (1.4  $\hat{a} \in 2.3$ ) indicating a static 'small-world' network despite the dynamic behavior of the borrowers. (Author's abstract)

Keywords: Physics, Networks, Time series analysis, Complex systems, Small-world network

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 21 Issue No. 1, 37-43 (Filipiniana Analytics)

#### Two-photon optical beam-induced current microscopy of light-emitting diodes Bautista, Jr., Godofredo S., Blanca, Carlo Mar Y., Saloma, Caesar A.

We demonstrate two-photon optical beam-induced current (2P-OBIC) microscopy of light-emitting diodes (LEDs). We utilized a Ti:Sapphire femtosecond laser source operating at 800 nm to derive the 2P-OBIC signal from a 605 nm band-gap LED. The spatial confinement offree carrier generation only at the focus and the quadratic dependence of the 2P-OBIC signal on excitation power are the key principles in two-photon excitation. As a consequence, superior image quality evident in the 2P-OBIC images of LEDs are obtained. These features decrease the linear absorption and wide-angle scattering effects plaguing single-photon optical beam-induced current (1P-OBIC) technique, thereby increasing the resolution of the imaging system in the axial and lateral directions. Thus, the attainment of good axial discrimination in the LED samples is obtained even without a confocal pinhole. In addition, 2P-OBIC images reveal local variations in free carrier densities which are not evident in the single-photon excitation. (Author's abstract)

**Keywords:** Physics, Two-photon optical beam-induced current (2P-OBIC), Ti:Sapphire femtosecond laser, Lightemitting diodes

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 61-65 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

0586

#### A variational perturbation approach Chan, L. C., Villanueva, A.

The paper discusses how the variationally inspired perturbation theory (VIPT) scheme of approximation in quantum mechanics can be improved convergencewise if one uses for variational trial functions the perturbative series with variational parameter, so that one is effectively doing variational calculations directly on the high-order perturbative series for energy. The result optimizes the high-order energy directly and thus represents a significant improvement over the VIPT procedure. When applied to a double potential in which even the VIPT is badly divergent, we saw that the result is still very much convergent. (Author's abstract)

Keywords: Physics, Variationally inspired perturbation theory (VIPT), Pertubation approach, Quantum mechanics

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 16 Issue No. 2, 22-25 (Filipiniana Analytics) Fil(S) Q1.A3 S4 16/2 2004

#### SCIENCE AND TECHNOLOGY

### Coconut fiber reinforced composite new technology approach to age-old solutions *Jorillo, Jr., Pablo A.*

A medium term R&D Program was developed in order to come-up with new technology approaches on the utilization of coconut husk fiber for construction. The program tackled basic questions on material optimization, design and test of product for specific application, validation and transfer of technology to adoptee. As much as parallel studies have been undertaken on natural fiber reinforced composites, test results vary widely and emphasis are more placed on non-structural applications, and hence limit the utilization technologies as well as its transfer to the adoptee industry or community-based organization. Therefore, this study addresses the new challenges on the utilization of natural fiber like coconut using emerging technologies for sustainable development with an ultimate objective of maximal utilization. Challenges on technology covers: new approach

quantity of materials quality and assurance raw comprehensive scientific characterization of fiber products leading advance to redirection studies towards material" framework of "low-cost redirection of efforts of use alternative material as This paper describes the highlights and significant results of the continuing medium-term program in the following areas of:

· Structural and non-structural applications of coconut fiber reinforced composites

Microstructure and morphology evaluation of fiber and fiber-matrix interface Durability property characterization under natural and accelerated weathering conditions

• Material constitutive modeling and analysis (Author's abstract)

Keywords: Science and technology, Coconut husk fiber, Microstructure, Durability

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 23 Issue No. 2, 23-67 (Filipiniana Analytics) Fil(S) T1 N21 23/2 1998

#### 0588

#### **Development of Philippine tropical fabrics from indigenous sources** *De Guzman, Zenaida I., Mangalindan, Nora B., Marin, Eduardo M., De Leon, Marites S.*

The development of an array of textile materials from indigenous fibers like abaca, banana and pineapple had been conducted with two major objectives - to judiciously utilize the country's abundant natural resources and to introduce a new set of fabrics that is distinctly Filipino. The prospects and potentials of the nation's rich and easily replenishable resources for the production of high quality clothing have been sought along with the government's thrust for export, product development, employment generation and regional development.

This study explored the feasibility of upgrading the over-all productivity in the use of abaca fibers and plantation waste fibers namely banana pineapple for textile on a pilot-scale level. The traditional process of textile manufacture was infused with appropriate scientific methodologies and industrial machineries to ensure a standardized quality of the resulting fabrics of globally competitive properties, and to hasten the production so as to cope up with rapidly changing technologies and increasing demand of the textile industry.

The process involved four major phases. First, fiber pretreatment which converts the raw fibers into spinnable

form through a series of biological, chemical and mechanical treatments. Second, spinning which transforms the fiber strands blended with polyester fibers into a single varn at desired fineness and twist. Third, weaving which refers to the interlacing of warp and weft yarns to construct fabrics, and fourth, finishing which improves the appearance, handle and performance of the fabric by the application of appropriate textile finishes. The treatments vielded an array of fabrics composed of polyester/banana, polyester/banana/silk, polyester/abaca, and polyester/pineapple with fiber blend ratios ranging from 60:40 to 75:25 (synthetic: natural). The fabrics were designed to fashionable. functional care competitively be and easy to vet priced.

The promotion of the prototype fabrics was undertaken through the sponsorship of the Garments and Textile Export Board, when said fabrics were launched in the 1st International Manila Fame Market Week and fashion tableau in January 1997. The event participated in by the country's selected designers triggered interest from various textile sectors and garment producers. At the height of these developments and to seize the worldwide clamor for products that are natural, the commercial production of Philippine tropical fabrics had been initiated. Technology transfer scheme had been advocated to possible takers of the optimized fiber pretreatment technology. The Institute had been working collaboratively with the Garments and Textile Export Board and the Fiber Industry Development Authority, and its partners in tropical fabric development like Manila Bay Spinning Mills and Weaver 's Textile Mills, for commercialization to take place. Backward linkages with corporate farms had also been established to ensure sustained production of banana and pineapple fibers for the ensuing commercialization.

With the technology firmly established and the unceasing support of the industry for commercialization to take its course, a new set of textile materials could be introduced in the market. More importantly, the research will open up new avenues for livelihood and income for the impoverished Filipinos. (Author's abstract)

Keywords: Science and technology, Indigenous fibers, Abaca, Banana, Pineapple

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 23 Issue No. 2, 1-21 (Filipiniana Analytics) Fil(S) T1 N21 23/2 1998

#### Effects of applied voltage on the mean diameter of electrospun polyaniline (PANI)elastomeric adhesive fiber *Emralino, Francis Murillo, Herrera, Marvin Ustaris*

The effects of applied voltage on the mean diameter of electrospun polyaniline (PANI)-elastomeric adhesive fibers were investigated. Polymeric solutions composed of equal volume of demethyl sulphoxide-dissolved polyaniline and elastomeric adhesive were prepared. These solutions were drawn into fibers by electrospinning with different applied voltage of 20, 30, 40, 50 and 60 kV. Scanning Electron Microscopy (SEM) images, together with fiber diameter measurements, showed that as the applied voltage was increased, the mean fiber diameter of the electrospun fibers also increased. The increase in mean fiber diameter was attributed to shortened flight time of the jets produced during electrospinning, increased deposition rate and bead formation, which contributed to the increase in fiber diameters. (Author's abstract)

Keywords: Science and technology, Conducting polymers, Elastomeric adhesive, Electrospinning, Polyaniline

### Electrochemical synthesis and corrosion performance of polypyrrole and poly(pyrrole-coaniline) films on copper

Viray, Angeline S., Binag, Christina A.

The cheapest and most commonly used metal to date is copper, which is highly prone to corrosion. However, copper is mostly used in highly corrosive environment, which degrades the metal's durability and costs money to multinational businesses. To protect metals, conducting polymers are one of the most promising materials.

In this study, the electropolymerization of polypyrrole and poy(pyrrole-co-aniline) on copper electrode was done with cyclic voltammetry. A 0.1M pyrrole (Py) in 0.1 M near neutral (pH 7.6)  $Na_2C_2O_4$  solution was used and a potential window of -0.5 V to +1.8 V. For the preparation of poly(pyrrole-co-aniline), a 0.1 M monomer solution of 0.5 M pyrrole and 0.5 M aniline were used.

The corrosion protection properties of these polymers were studied using the open circuit potential (OCP) measurement in 3.5% NaC1 (aq). PPy had the best corrosion protection properties, followed by poy(pyrrole-co-aniline). PPy showed responses going towards more positive potentials compared to the copolymer and bare copper upon immersion to saline solution, which is due to both the pseudo-layer of copper oxalate complexes formed on the copper surface before polymerization and the polymer coat synthesized on its surface. SEM micrographs showed that polypyrrole exhibited multiple layers synthesized on the surface of copper, which contributed to its efficiency on protecting copper from corrosion. (Author's abstract)

Keywords: Science and technology, Polypyrrole, Polyaniline, Corrosion, Open-circuit potential, Votammetry

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 147 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0591

#### **Evaluation of the effectiveness of fabric stain removers** Delfin, Rita G., Wu, Analiza C., Garcia, Lilian B., De Guzman, Zenaida I., Almario, Edi

Realizing the need to substantially address the problem of the textile and garment sectors on stain removal, a study on the evaluation of the effectiveness of commercially available local and imported stain removers was conducted. The study focused on the most frequently encountered stains in the textile and garment industries namely grease, ink and rust. Swatches of cotton, polyester, rayon, acetate and polyester/cotton fabrics were used as stained samples.

Each of the stain removers was rated for its effectiveness in removing rust, grease or ink stains. The products tested were found to differ in stain removal ability, depending upon the chemical composition of the stains and the fiber content of the fabrics and the method of removal. (Author's abstract)

Keywords: Science and technology, Fabric stain remover, Grease, Ink, Rust, Cotton, Polyester, Rayon, Acetate, Polyester/cotton

### Google earth: a tool for eliciting spatial information about forest degradation from local people

#### Vallesteros, Arvin P., Bantayan, Nathaniel C., Calderon, Margaret M., Pulhin, Juan M., Cruz, Rex Victor O.

As a component of REDD or REDD+ 9 Reduced Emissions from Deforestation and Forest Degradation), detection and measurement of forest degradation has been widely reported in literature as technically difficult. This is because forest degradation is not easily detected and measured using satellite imageries, a situation that requires increased used of field data and information from local people. Hence, all available technology must be used including Google Earth that provides virtual landscape of localities on earth.

A high resolution Google Earth imagery was used to delineate watershed boundary; map streams, roads, trails, houses and other ground features; stratify forest vegetation according to carbon stock; and as input for interpreting Landsat ETM+ data. More importantly, the three dimensional virtual landscape enhanced collection of information about historical change in extent and composition of forest vegetation, proximate drivers of forest degradation, and risk of degradation based on historical trend. Using the virtual landscape as visual aid, key informant interview and workshop were conducted to elicit information. It was observed that, using an effective visual aid, local people can easily grasp such technical concepts as percent canopy cover, relationship between tree diameter and tree crown, appearance of canopy in the imagery according to species composition and tree density, and carbon stock decline as indicator of forest degradation. The information elicited from local people when combined with GIS ancillary data, Landsat ETM+ data, and field data resulted in reliable estimate of forest degradation in Maasin Watershed in Nueva Vizcaya. (Author's abstract)

**Keywords:** Science and technology, Google Earth imagery, Forest degradation, REDD, Local knowledge, Participatory GIS

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 197 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

#### 0593

### Halogen-free, imidazolium based ionic liquids for organic and inorganic syntheses *Arco, Susan D.*

Ionic liquids (IL) are designer solvents exhibiting negligible vapor pressure, high thermal stability, wide liquid range, and excellent ability to dissolve various inorganic and organic compounds. Typical ILs consist of N,N' - dialkylimidazolium cations and a wide variety of halide-based anions but the presence of halides in these ILs raise environmental concerns when the hydrolysis stability of the anion is poor or when a thermal treatment of the IL in use is necessary. In response to this, two series of halogen-free, 1-alkyl-3-methylimidazolium [RMIM] based ILs, [RMIM] Acetate and novel [RMIM] Lauryl Sulfate (LS), have both been prepared through a two step procedure: step (1) involves a reaction between 1-methylimidazole and the appropriate alkylbromide to yield [RMIM]Br and step (2) involves the exchange of the bromide ion in [RMIM]Br with sodium acetate or sodium LS to afford the halogen free ILs. A comparison of optical properties of 1-butyl-3-methylimidazolium [BMIM]LS and [BMIM]Br shows that the interesting excitation wavelength-dependent behavior observed in both ILs is typical of ILs bearing the imidazole moiety. The Diels-Alder reaction provides a means by which heterocyclic ring may be produced from acyclic precursors in a single step and the endoselectivity (endo:exo=91:1) and product yield (89%) obtained for the

Diels-Alder reaction between cyclopentadiene and methyl acrylate in 1-hexyl-3-methylimidazolium [HMIM] Acetate is remarkably high. The control of the morphogenesis of gold nanoparticles leads to unique properties that are essential to applications such as catalysis and analytical sensing. [RMIM] LS has been utilized both as a solvent and as a stabilizing agent in the synthesis of anisotropic gold nanostructures and the morphogenesis of these gold nanostructures has been examined. Presence of [BMIM] LS stabilized the formation of Au nanoplates as well as intertwined Au nanoparticles and nanorods. (Author's abstract)

Keywords: Science and technology, Ionic liquid, Lauryl sulfate, Diels-Alder, Stabilizing agent, Morphogenesis

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 161 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0594

#### Lactic acid fermentation from *Jatropha curcas* L. press cake and raw cassava starch using *Rhizopus oryzae* NRRL-395

#### Perdon, Liza Rowena DLC., Elegado, Francisco B., Migo, Veronica P., Movillon, Jovita L., Demafelis, Rex B.

The utilization of *Jatropha curcas* L. for biodiesel production, produces significant amount of press cake as byproduct. Toxic compounds render the cake unsuitable for animal feed. Thus other uses, such as substrate for fermentation should be explored. Its use for lactic acid production was tried in this study.

Dilute-acid hydrolysis of Jatropha press cake substrate was initially optimized, specifically pH conditions and duration of autoclaving. The highest value of reducing sugars recorded was 86.6 g/L obtained by hydrolyzing the samples at pH 1.0 for 30 minutes. Upon fermentation with Rhizopus oryzae NRRL-395, starch-supplemented hydrolyzed Jatropha press cake produced 3.67 g/L lactic acid in one day at pH 5.0. On the other hand, unhydrolyzed press cake took four days to ferment, but attained the highest value of 11.93 g/L lactic acid. Hydrolyzed samples could have produced sugars that are not utilizable by Rhizopus orvzae.

The use of *Jatropha* press cake as protein supplement for the fermentation of raw cassava starch into lactic acid was feasible. This would probably provide a good alternative to reduce the fermentation costs due to chemical supplements. Further optimization is still needed for it to be suitable for large scale production. (Author's abstract)

Keywords: Science and technology, Lactic acid fermentation, Jatropha curcas, Cassava starch, Rhizopus oryzae

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 193 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0595

#### Microemulsified hybrid fuel from jatropha and coconut oils

Briones, Annabelle V., Bawagan, Apollo Victor O., Mallillin, Armando T., Trinidad, Oscar R., Avila, James E., Esperanza, Ramon C., Aquino, Juanito P.

A microemulsified hybrid fuel from *jatropha* and coconut oils was developed through the process of microemulsification. This was done by mixing the oils with surfactant, co-surfactant and water. The resulting

product was evaluated in terms of phase behavior and physicochemical properties. Application tests were done in high powered lantern (petromax) for lighting and gas stove for cooking. Results of the study showed that microemulsions of *Jatropha* oil and coconut oil and its blend are thermodynamically stable, have low viscosities and stable against oxidation. Application tests showed that microemulsified blend of jatropha and coconut and blends with kerosene have better lux range and less fuel consumption than using kerosene in petromax. In gas stove, results showed that blends of microemulsified jatropha and coconut oil with kerosene, exhibited less fuel consumption, high thermal and combustion efficiency, reduced CO and CO<sub>2</sub> emission. Results of the analysis of physicochemical properties, smoke emission test and vehicle performance showed its potential as alternative fuel for transport. Application test of microemulsified hybrid fuel in diesel genset showed reduced fuel rate consumption, liter per hour of about 53.0% to 76.5%.

The process of microemulsion is simple with no residual waste product to be disposed or treated. Microemulsion fuels are generally cleaner fuel. Microemulsion fuels provide a method fro increasing the use of *jatropha* and coconut oil as fuel. It has the ability to significantly reduce petroleum consumption as well as lower harmful and particulate emissions. (Author's abstract)

Keywords: Science and technology, Microemulsification, Jatropha oil, Coconut oil, Hybrid fuel

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 190 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0596

#### Microwave-assisted reaction: a cleaner and efficient method for the synthesis of indazoles and benzimidazoles Creencia, Evelyn C., Horaguchi, Takaaki

The use of microwave radiation for heating reaction mixtures has proved to be a convenient method for the synthesis of indazoles and benzimidazoles as it can carry out the reaction under solvent-free condition, at shorter reaction time and with better product yield.

A domestic microwave oven was used to carry out the reactions. The starting materials were placed in a test tube and mounted in an Erlenmeyer flask. This set-up was placed inside tha cavity of the oven and irradiated for several minutes at a particular power. The products were identified by their IR, <sup>1</sup>H nmr and <sup>13</sup>C nmr spectroscopic data.

A 77% yield of 2-phenyl-2*H*-indazole was obtained by irradiating a mixture of 1.0 mmol *N*-(2-nitrobenzylidene)aniline and 4.0 mmol  $P(OEt)_3$  for 14 min at 200W. 2-(1Naphthyl)-2*H*-indazole was obtained in 89% yield when N-(2-nitrobenzylidene)-1-Naphthylamine and  $P(OEt)_3$  was irradiated for 14 min at 200W. Irradiation of *N*-benzylidene-2-nitroaniline and PPh<sub>3</sub> for 5 min at 200W gave 96% 2-phenyl-1*H*-benzimidazole. other indazoles and benzimidazoles were also synthesized using the microwave-assisted method. The results showed that high yields were obtained at shorter reaction times and without excessive use of organic solvents. (Author's abstract)

Keywords: Microwave-assisted reaction, Indazoles, Benzimidazoles, Imines, Synthesis, Science and technology
#### Production of particleboard from *Nymphaea stellata willd* (water lily) fiber with highdensity polyethylene (HDPE) and polystyrene (PS) as binders

Enerva, Lorna T., Malaborbor, Pastor B., Caguete, Mayenee D., Mendoza, Ana Marie B., Nepomuceno, Jovellyn Shara F., Sangalang, Ma. Angelica B.

Water-lily, best describe as queen of the water, is a floating-leaved perennial herb that grows rooted in shallow lakes and swamps. When left unmanaged, it tends to form hence mono specific strands that can cover hundred of hectares. This study was undertaken to produce particleboard made of waste materials plastics and water lily plant.

Three sacks of water lily plants were collected from the Pasig Rivera and oven-dried. The plastics used were high density polyethylene (HOPE) and polystyrene (PS). The particleboards that were made from water lily fiber and HDPE and PS had the following weight- weight ratio of 20:80, 25:25 and 40:60. The fiber and the polymer were mixed on the roll milling machine to form a homogeneous mot. The tests made were: chemical resistance analysis, tensile strength, breaking strength, density, moisture and scanning electron microscope. The 40:60 water lily/HDPE and water lily/PS became slightly rough upon exposure to 30% NAOH. The 40:60 ratio also gave the best for tensile strength with 13.33 MPa for water lily/PS and 14:00 MPa for water lily HDPE. The results showed that the 40:60 on both PS and HDPE gave the highest value for the ultimate load. Both particleboards of the same ratio gave 28MPa Flexural Strength. As the ratio of the fiber against the polymer increases, the denser the particleboard becomes. The density ranged from 2.31 to 2.37 g/cm3 for the 40:60 water lily/HDPE and 40:60 water lily/PS. The moisture content ranged for 0.16 to 0.47 for all the different ratios of the particleboards. The scanning electron microscope was used to characterize the surface morphology of the specimen and to check the distribution of the fibers on the particleboard. The magnifications used were; 150,750, 1500 and 3500. (Author's abstract)

Keywords: Science and technology, Particleboard, High density polyethylene polystyrene, Scanning electron microscope

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 133-134 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

0598

#### **Properties and performance of MMSU hydrous biofuel** Agrupis, Shirley C., Ulep, R. A., Mateo, N., Ascano, R., Birginias, M. B., Valencia, M. A., Abenes, F.B.

Modified fermentation techniques at ambient temperature and simplified reflux distillation protocols were developed to produce the MMSU 95 hBE bioethanol and the MMSU hBE-20 gasohol fuel blend.

The 95% fuel-grade hydrous ethanol, *MMSU 95 hBE*, was produced from sweet sorghum and sugarcane and was subsequently used to formulate a unique hydrous gasohol blend: the *MMSU hBE-20*. Unlike other hydrous ethanol fuel blends formulated in other countries, our formulation does not need a dispersant, nor a co-solvent and uses the commercially available anhydrous E-10 gasohol blend. The *MMSU hBE 20* was stable at ambient temperature and did not show phase separation even at refrigerated conditions. Preliminary tests of the gasohol, when used in stationary 4-stroke engines, motorcycles and motor vehicles, revealed no discernible problems. The performance of a 6.5 HP engine when fueled with *MMSU hBE-20* was comparable with the commercial E-10. Under different engine load of 4, 6, and 8 kg, the fuel consumption (L/hr), brake horsepower (BHP), brake fuel rate (L/BHP-hr), heat value (Btu/lb), and brake thermal efficiency of the same engine fueled with *MMSU hBE 20* did not vary significantly with the E-10-fed engine. Further tests indicate the *MMSU 95 hBE* can also be used up to e-85, indicating the possibility that it can be suitable for use in modern Flec Fuel Vehicles (FFV) when they become

available

in

the

Philippines.

The *MMSU hBE 20* is a promising fuel for gas powered engines and vehicles that is more economocal and environmentally sustainable than blends using anhydrous ethanol. More important, these technologies are scaleadaptable and easily adoptable at the village level to create an enterprise that is economically viable. Current forecast indicate an average production cost of PHP 30 using feedstocks from sugarcane and sweet sorghum which, when compared to the prevailing cost of gasoline, can result in a profit margin of about 67%.

Commercialization of these technologies will open opportunities for village level ethanol production and would be a significant contribution towards the implementation of several Republic Acts: the RA 9637- the Philippine Biofuels Act, RA 9003- Philippines' Ecological Solid Waste management Act, RA 9513- The Philippines Renewable Energy Act, and the RA 8749- The Philippine Air Act. (Author's abstract)

**Keywords:** Science and technology, Village-scale ethanol production, MMSU 95 hBE, MMSU hBE-20, Hydrous ethanol, Reflux distillation, Biofuel

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 188 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

0599

#### Rapid synthesis under mild conditions of an acrylic diamide N, N, N', N'T etrabutylphthalamide, a potential antimicrobial agent

Abrenica, Graniel Harne A., Bernardo, Valeree Ross R., Paredes, Fiona U., Arco, Susan D.

The amide functional group is a common feature in both small and complex synthetic or natural molecules. It is one of the most significant functional groups of organic molecules in terms of medicinal use. Medicinal Chemistry database showed that approximately 25% of known drugs contain this carboxamide group. The synthesis of acyclic diamide, N, N, N', N' – tetrabutylphthalamide, by the condensation with phthalic anhydride in dioxane of dibutylamine proved to be highly efficient. A product yield of 85% was obtained under mild conditions (6-hour reaction time at 27ÚC). The product was recrystallized in acetonitrile. The successful synthesis was confirmed through spectroscopic techniques such as infrared, nuclear magnetic resonance and mass spectroscopy. The purified product was tested for antimicrobial activity against *Escherichia coli, Staphylococcus aureus, Candida albicans* and *Aspergillus niger*. Chlorampenicol and clotrimazole were used as positive controls. The acyclic diamide exhibited antimicrobial activity with an antimicrobial index of 0.1 against Escherichia coli, 0.3 against *Staphylococcus aureus* and 0.2 against *Candida albicans*. No inhibition activity against Aspergillus niger was observed. (Author's abstract)

**Keywords:** Science and technology, Acyclic diamide, Medicinal chemistry, Condensation reaction, Antimicrobial agent, Antimicrobial index

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 150 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

#### Yield potential of rain tree fruit (Samanea saman Merr.) as feedstock for biofuel production Simon, Samuel R.

This study was conducted to determine the ethanol yield potential of rain tree fruit and to evaluate its potentials as a feedstock for biofuel production.

Ripe rain tree fruits were fermented using baker's yeast (Saccharomyces cerevisiae) with the following treatments with three (3) replications each: Treatment 1 ( $T_1$ )- fermentation of the whole fruit pods; Treatment 2 ( $T_2$ ) - fermentation of the fruit with the seeds removed and Treatment 3 ( $T_3$ ) - fermentation of the filtered mixture only (solid particles consisting of pulp, bark and seeds were removed). One (1) kg of pounded and blended fruit was used for each replication and was fermented for 10 days in a six-gallon water container.

Results of this study reveals that using the basis that fifty percent (50%) of the measured sugar level is converted into ethanol,  $T_1$  obtained the highest yield potential of 210 ml/kg. Based on the alcohol content analysis of the fermented solution the highest ethanol yield was obtained by  $T_1$  (180 ml/kg), followed by  $T_2$  (177 ml/kg) while  $T_3$ (162 ml/kg) obtained the lowest ethanol yield among the treatments. Moreover, based on the alcohol analysis of the distillate,  $T_1$  (117.03 ml/kg) obtained the highest average ethanol yield followed by  $T_2$  (116.40 ml/kg) while  $T_3$ (90.23 ml/kg) obtained the lowest. Analysis of variance reveals that there is a significant difference among the treatments at 5 percent level of significance.

This study found out that rain tree fruit has a yield potential of 210 ml/kg (210 liters/ton). Comparison of the yield potential of rain tree fruit with other feedstock reveals that the rain tree fruit is a very good feedstock for biofuel production. It is recommended that optimization studies should be conducted in all aspects of fruit processing, from particle size reduction to fermentation and distillation, for optimum bio-ethanol production. (Author's abstract)

**Keywords:** Science and technology, Rain tree fruit, Ethanol yield, Biofuel feedstock, Biofuel production, Fermentation

Transactions of the National Academy of Science and Technology, Volume No. 33 Issue No. 1, 187 (Filipiniana Analytics) Fil(S) Q149.P5 N25 33/1 2011

#### SOCIAL SCIENCES

0601

## The economic impact of the demographic crisis: its implications on public policy *Medalla, Felipe M.*

The Philippines is "over-populated" not in relation to its natural carrying capacity but in relation to the performance of its economy and government. Clearly, it would be better to improve the performance of the government and the economy than to just get government involved in fertility choices of households. However, given the history of the performance of both government and the economy, population policy can clearly help improve the nation's welfare. Government must provide public goods and services and its capability to deliver them is affected by population growth. Moreover, the impact on government of high fertility may be even more serious than suggested by the average level of total fertility rate since children's education is closely correlated with their parent's poorer education and and less educated parents tend to have more children.

Government's capability to meet the needs of the country's growing population has been impaired by a weak

economy and high levels of public debt. Due to high expenditures on interest payments and weak tax collections, the government's deficit is high and its level of indebtedness may become unsustainable even at present inadequate levels of spending on basic social services and infrastructure.

Government's ability to meet the needs of the population will clearly be improved if fertility can be brought down. Fertility can be reduced significantly without resorting to coercive policies. Poor and less educated parents have higher fertility than average, but their desired fertility is much lower than their actual fertility. Population policy can go a long way simply by helping people attain their desired family sizes. (Author's abstract)

Keywords: Social sciences, Demographic crisis., Public policy, Basic social services, Fertility, Population policy

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 4 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

#### Eliciting indigenous knowledge system on natural resource management strategies: a case study in the cordillera region, Philippines Magcale-Macandog, Damasa, Abucay, Edwin R.

Natural resource management in the Cordillera Region has been practIced for several decades. This Indigenous Knowledge System (IKS) of the people in the region has sustained their lives and maintained the biodiversity of the region's natural resources. This paper aims to elicit the IKS for indigenous plants and its sustainable application to natural resource management (NRM) in the region and the role of information and communication technologies (ICTs) in information organization, management, and dissemination.

IKS documentation was done through a literature survey and Participatory Rural Appraisal (PRA) activities including key informant interviews, group discussions, and field visits. A Database Information System (DIS) was developed to organize the gathered data. Many indigenous plants are used in NRM in the region. The *muyong* of the lfugaos is an internationally recognized and ideal NRM system. Indigenous plants are mainly found in *muyongs*, which are sources of food, medicinal herbs, wood and other construction materials. The *batangan* system in Mt. Province is mainly used as source of wood. Contrary to the existing knowledge on shifting cultivation, *uma* system or patch farming in the region is practiced to rejuvenate soil fertility using indigenous plants such as *Tithonia diversifolia* (sunflower). In *payew*, cuttings of sunflower are applied as organic fertilizer for growing rice and sweet potato. ICTs (e.g., Internet, radio, computer) can be used as effective tools to organize, promote, conserve, and sustain the IKS. The availability of a database provides a better understanding of the IKS and a window for IKS analysis. ICT tools can be used to organize, analyze, disseminate, and sustain such knowledge for future generations and as a learning tool for farmers, researchers, academe, and policymakers. (Author's abstract)

*Keywords:* Social sciences, Indigenous knowledge system (IKS), Natural resource management strategies (NRMS), Information communication technologies (ICTs)

Transactions of the National Academy of Science and Technology, Volume No. 31 Issue No. 1, 159 (Filipiniana Analytics) Fil(S) Q149.P5 N25 31/1 2009

### Using the capabilities approach to analyze access to information and communication technologies (ICTS) by the poor Alampay, Erwin A.

This paper applies Amartya Sen's "capabilities approach" to the access and use of ICTs. An important issue raised by the Capabilities Approach is that while access to a basic good, in this case information and communication technologies (ICTs), is a prerequisite to its usage, individual differences, capabilities and choice also play a role on the use, value and application of these goods. As such, the paper investigates the extent to which people have access to ICTs, the characteristics of people who make use of it, and how and for what ends they are utilized. Based on household surveys conducted in urban and rural barangays in Puerto Princesa City, it attempts to analyze access beyond the traditional method of considering teledensities and number of Internet service providers (ISPs), but instead focuses on key demographic traits in a community and how these influence their capabilities, functioning and freedoms with respect to ICT use. (Author's abstract)

Keywords: ICT, Social sciences, Information, Communication technologies, Teledensities, Capabilities approach

Transactions of the National Academy of Science and Technology, Volume No. 25 Issue No. 1, 20 (Filipiniana Analytics) Fil(S) Q149.P5 N25 25/1 2003

#### STATISTICS

0604

#### Development of a Beowulf-Class High Performance Computing System for Computational Science Applications

#### Saldaña, Rafael, Garcia, Jerrold, Muga, II, Felix, Yu, William

Using Beowulf cluster computing technology, the Ateneo High Performance Computing Group has developed a high performance computing system consisting of eight compute nodes. Called the AGILA HPCS this Beowulf cluster computer is designed for computational science applications. In this paper, we present the motivation for the AGILA HPCS and some results on its performance evaluation. (Author's abstract)

**Keywords:** Statistics, High-performance computing system, Cluster computing, Beowulf cluster, Performance evaluation, Computational science applications

Science Diliman, A Journal of Pure and Applied Sciences, Volume No. 13 Issue No. 2, 97-99 (Filipiniana Analytics) Fil(S) Q1.A3 S4 13/2 2001

#### **VETERINARY MEDICINE**

0605

Application of non-conventional acupuncture in sheep, cattle and water buffaloes *Acorda, Jezie A.* 

Acupuncture is an alternative approach for the treatment of various diseases and disorders in animals. Although it is less expensive and has less side effects compared to conventional drugs and other chemicals, its potential for use in animals in the Philippines has not been thoroughly investigated. In this series of studies, different methods of acupuncture were used in cattle, water buffaloes and sheep, namely: pneumoacupuncture (injecton of air), hypodermic needle acupuncture (stimulation using disposable hypodemic needles), and aquapunture (injection of distilled water, 5% lactaded Ringer's solution, vitamin ADE solution, 2% lidocaine solution and capsicum decoction). Results show that non-conventional acupuncture methods can: 1) produce analgesia sufficient for performance of surgical procedures; 2) increase reproductive performance; 3) be used for treatment of reproductive disorders; and 4) increase white blood counts in ruminants. (Author's abstract)

*Keywords:* Veterinary medicine, Acupuncture, Analgesia, Aquapuncture, Blood cell counts, Cattle, Pneumoacupuncture, Reproduction, Sheep, Water buffaloes

Philippine Technology Journal: a quarterly publication for applied researches, Volume No. 23 Issue No. 2, 77-85 (Filipiniana Analytics) Fil(S) T1 N21 23/2 1998

#### 0606

## The modified horn ring method as a tool in determining the age of carabao *De Ocampo, Grace D., David, Olga Marie C.*

The accuracy of the modified horn ring method to determine the age of carabao (Bubalus bubalis) was tested using 127 carabaos of both sexes, aged one to 23 years old, randomly selected at an auction market. The length and circumference of the horns were measured while the number of rings were counted in both the right and left horns. The results showed that although variations occurred in the length, circumference and number of rings between right and left horns and between male and female animals in relation to age, such variations were not statistically significant. Furthermore, the linear regression model showed a direct correlation between t he number of horn rings and the age of the animal. Thus the formula: 1.22322503 .264245856 y = + (x)

where y is the age and x is the number of horn rings, was arrived at to estimate the age of the carabao. Using this formula, a table of confidence interval (Table 2) was subsequently made to facilitate age determination. (Author's abstract)

Keywords: Veterinary medicine, Bubalus bubalis, Horn ring method, Age determination, Ruminant

NRCP Research Journal, Volume No. 3 Issue No. 2, 191-200 (Filipiniana Analytics) Fil(S) Q179.9 N323 3/2 1993

#### ZOOLOGY

## An annotated checklist of the dragonflies of Cebu Island, the Philippines with notes on conservation

#### Villanueva, Reagan Joseph T., Seidenschwarz, Franz

New records and an updated checklist of the dragonflies of Cebu Island are provided. Drepanosticta sugbo spec. nov. is described from Kawasan Falls. Badian. Eighteen species are recorded from Cebu for the first time, which increases the number of known species in the island to 53. Philippines. Aethriamanta subsignata is reported the as new to The additions increase the number of formally described species known from the Philippines to 268. Three species, which are endemic to Cebu, are at a very high risk of going extinct within the next decade. The threats to the Cebu dragonfly fauna are briefly discussed and three sites are recommended for immediate conservation measures. (Authors' abstract)

Keywords: Zoology, Dragoflies, Drepanostica sugbo, Aethriamanta subsignata, Odonata

Philippine Scientist: a scholarly journal for natural and physical sciences and mathematics, Volume No. Issue No., 1-16 (Filipiniana Analytics) Fil(S) Q1 J95 v.49 2012

0608

#### Antigonadotropic effects of precocene II: allaticidal action in females of Nilaparvata lugens (Stal) Pradeep, A. R., Nair, V.S.K.

Exposure of day 0, 1, 2 and 3 fifth instar nymphs and newly ecdysed brachypterous females of *Nilaparvata lugens* to different doses of the antijuvenile hormone agent, precocene II (PII) residue inhibited ovarian growth and oocyte maturation, reduced fecundity and induced sterility in a dose-dependent manner. High dose of 5  $\mu$ g / cm<sup>2</sup> induced complete sterility. Severe histopathological alterations were obserbed in the ovariole and oocytes of insects treated with high doses. Fellicular epithelial cells invaded ooplasm. Uncontrolled multiplication resulted in hyperplasia of the epithelia. Exposure of PII-pretreated nymphs to juvenile hormone analogue ( $3\mu$ g JHA/cm<sup>2</sup>) did not enhance fecundity, indicating the requirement of intact corpora allata later in the final instar for pre-ecdysial ovarian growth and maintenance. But JHA treatment to PII-pretreated adults restored normal rate of fecundity, revealing PII-induced JH deficiency as the cause of infecundity, PII induced significant reduction in size of corpus allatum and cellular degeneration in he treated insects. Infecundity, ovarian histopathology and allatal atrophy apparently suggest that the observed anti-juvenile hormone effects of PII i *N. lugens* female are due to its systematic allaticidal activity. (**Author's abstract**)

Keywords: Zoology, Nilaparvata lugens, Precocene II, Sterility, Anti-allatal effects

The Philippine Entomologist, Volume No. 14 Issue No. 2, 175-183 (Filipiniana Analytics) Fil(S) QL461 P5 14/2 2000

0609

A checklist and host index of Philippine mites (acari) associated with arthropods *Corpuz-Raros, L.A.*  A list of 104 Philippine mites associated with insects and other arthropods is presented together with a host index. These were collected from 73 determined an a few undetermined hosts. All major acarine suborders are represented with 45 species belonging to the Gamasida, 1 to Ixodida, 32 to Actinedida, 18 to Acaridida and 8 to Oribatida. Arthropod hosts include the orders Hymenoptera with 55, Coleoptera with 50, Hemiptera with 7, Lepidoptera with 6, Blattodea and Diplopoda each with 5, Diptera with 2, and Scorpionida and Crustacea each with 1 mite associate.

Two mite species, *Hemipteroseius indicus* (Krantz and Khot) (Otopheidomenidae) and *Eviphis cultratellus* (Berlese) (Eviphididae) are reported for the first time from the Philippines. Some new locality and host records are also given for a few species of mites (Author's abstract)

Keywords: Zoology, Acari, Arthropod-associated mites, Faunal checklist, Insect hosts of mites, Phoretic mites, Philippines

The Philippine Entomologist, Volume No. 15 Issue No. 1, 45-66 (Filipiniana Analytics) Fil(S) QL461 P5 15/1 2001

# **AUTHOR INDEX**

Ababon, Myka Francesca R.	0184	Aggangan, Nelly S.	0162
Abad, Lucille V.	0257	Agoo, Esperanza Maribel G.	0137
	0564	Agpalza, Estrelita P.	0419
Abao, Rex Samuel A., Jr.	0164	Agra, F.	0529
Abella, Evaristo A.	0127	Agrupis, Shirley C.	0140
Abello, Melpha	0008		0598
-	0038	Aguilar, Jr., Antonio S.	0316
	0103	Aguinaldo, A.R.	0258
	0111	Aguinaldo, Alicia M.	0513
Abenes, F.B.	0598	Aguinaldo, Ma. Alicia M.	0482
Abengana, Justin Paolo B.	0150	Aguinaldo, Teresito G.	0300
Abes, E.	0285	Agustin, Jan Aldrich A.	0364
Abes, Nancy S.	0074		0567
Abila, Christine P.	0369	Agustin, Oliver C.	0030
Abisado, Rhea G.	0187	Alabastro, Estrella F.	0348
Abrenica, Graniel Harne A.	0599	Alampay, Erwin A.	0603
Abucay, Edwin R.	0602	Alantara, Edwin	0050
Acebedo, Fairie Ann	0196	Alarcon, Minella C.	0560
Acedo, Jr., Antonio L.	0058	Alcala, A. C.	0279
Aceret, Antonieta A.	0486	Alcala, A.C.	0395
Achondo, Marion John Michael M.	0235	Alcala, Angel C.	0180
Acorda, Jezie A.	0605	Alcala, E. L.	0279
Acosta, Rowena D.	0196	Alcala, Ely L.	0180
Acoymo, Ramon Maria G.	0287	Alcantara, Edwin P.	0278
Adair, Linda S.	0370	Alegria, Melissa O.	0372
Adducul, Andre Cedric Y.	0139	Alejandrino, A. L.	0048
Adiova, Joden M.	0162	Alejandro, Priscila P.	0423
Adorada, Jjessmyn R.	0024	Aleta, Carlito R.	0554
Afalla, Jessica Pauline C.	0521	Alfafara, Catalino G.	0187
Affendi, Y. A.	0391	Alfeche, Aida Christine A.	0368
Africa, Criselda R.	0276	Alfon, Jhoe Anthony	0444
Aganon, Clarita P.	0002	Alfonso, Antonio A.	0122
Agbayani, Amelia L.	0039	Alforja, Emma M.	0067
Agbayani, Patricia Teresa F.	0255	Alguno, Arnold C.	0516
Agbayani, Sr., Benigno F.	0438		0539
-	0477	Ali, A. A.	0336
Agcaoili, Norberto	0506	Aliño, Porfirio	0328
Agdaca, Cheryl D.	0069	Alibuyog, Nathaniel R.	0093

Aliganga, Anne Kathrena A.	0266	Aquino, Juanito P.	0595
Alipon, Marina A.	0355	Araguas-Araguas, Luis	0541
Almario, Editha E.	0591	Aranilla, Charito T.	0257
Almoro, Percival F.	0547		0564
Alonzo, C. A.	0532	Arceo, Carlene P.	0428
	0583		0429
Alonzo, Ma. Anna M.	0032	Arciaga, R.	0445
Alpino, Julius P.	0380	Arco, Susan D.	0593
Alvarez, Ma. T.	0361		0599
Amante, A.	0285	Ardeña, Julita G.	0342
Amarra, Ma. Sofia V.	0434	Arellano, Gema A.	0499
Amatorio, Emmanuel Q.	0027	Arrienda, II, Faustino Q.	0112
Ambal, Wilhelmina O.	0251	Arugay, Esperanza Blancaflor	0407
Amedo, Charina Lyn A.	0403	Asa, Anie Day DC.	0239
Amistoso-Recina, Grace	0499		0270
Amoguis, Alvin V.	0462	Asaad, C. O.	0048
Amoroso, Cecilia B.	0314	Ascano, R.	0598
Amoroso, Victor B.	0227	Asencion, A. B.	0022
	0314	Asis, Jules Jason C.	0129
Amorsolo, Jr., Alberto V.	0308	Ask, Erick	0402
Anderson, James A.	0070	Asuncion, Alvie J.	0527
Ang, C. F.	0445	Asuncion, Nestor T.	0033
Angeles, Enrique	0006	Atillo, Roy P.	0470
Aniago, Ryan Joseph	0270	Auresenia, Joseph	0293
Aniversario, Imelda S.	0418	Aurigue, Fernando B.	0091
Anonuevo, A.	0282	Avenido, Renato A.	0121
Antimano, Veronica	0127	Avila, James E.	0595
Antonio, Juan Paulo M.	0301	Ayade, Heev	0165
Anuar, E. A.	0391		0566
Anzaldo, Felicidad E.	0273	Azanza, Ma. Patricia V.	0346
Aoki, Takashi	0232	Azanza, Rhodora	0402
Aparato, Aurea R.	0245	Azanza, Rhodora V.	0392
Apostol-Nicodemus, Leilanie S.	0464	Babb, Gina M.	0122
	0499	Bacabac, Rommel	0165
Aquino, Alicia G.	0011		0524
	0024	Bacabac, Rommel G.	0566
Aquino, Gerald Ryan R.	0508	Baclayon, M. F.	0583
Aquino, Hilda F.	0442	Baclig, Michael O.	0470

Baconguis, Rowena T.	0017	Barrion, Adelina A.	0147
Baconguis, Santiago, R.	0125		0197
Badillo, Fr. V.	0568	Barrion, Alberto T.	0025
Bahague, Jr., R. T.	0569		0078
Bailon, M. F.	0536		0080
	0556	Barrion-Dupo, Aimee Lynn	0216
Bajet, C. M.	0049	Barroga, S. F.	0120
Balancio, Pauline Nietzche P.	0016	Bascos, Neil Andrew	0472
Balane, Arlan Rosegrace S.	0465	Basman, Camila V.	0346
Balangcod, Kryssa D.	0179	Batalon, Johnny T.	0376
Balangcod, Teodora D.	0179	Bautista, Gene C.	0096
Balaoing, Jose G.	0063	Bautista, Jing R.	0192
Balatibat, Juancho B.	0230		0209
	0350	Bautista, Jr., Godofredo S.	0585
Balatucan, Archien	0306	Bautista, L.	0285
Baldovino, Manuel M.	0182	Bautista, Marc Leo G.	0005
Baldueza, Vanessa D.	0154	Bautista, Ramer P.	0290
Balgos, Nelly S.	0251	Bautista, Ricabelle H.	0299
Baliquig, Caren Grace Marife B.	0368	Bawagan, Apollo Victor	0484
Balisacan, Arsenio M.	0106	Bawagan, Apollo Victor O.	0595
Balmaceda, Jose Maria P.	0427	Bawalan, Ralph Julius G.	0161
Balmori, Rochelle Therese F.	0319	Bayot, Rolando G.	0011
Baltazar, Leilani A.	0206		0013
Bandara, J.W.	0043		0024
Bantayan, Bryan	0306	Beachy, Roger N.	0122
Bantayan, Nathaniel C.	0356	Becira, Eunice M.	0323
	0592	Becira, Joel G.	0335
Banting, Michael Paul C.	0500		0338
Banzon, R. S.	0576	Bedia, E. L.	0313
Baranda, Jaela Nicole	0204	Beebout, Sarah J.	0066
Barangay Health Officials in Sayanan & Mangangan	0468	Palan Josamari M	0099
Barba, Ramon C.	0121	Belen, Ma Adelia C	0050
Barcelos, A.	0285	Pelizerio Ir. V.V.	0120
Barican, Juanito V.	0067	Delizario, Jr., V. 1. Palizario, Ir. Vicento V	0491
Barilea, Ivan Dale U.	0283		0439
Barrida, A. C.	0022	Belleza Dominic Franco C	0164
Barrion, Adelina	0216	Beltran Elizabeth D	0054
- ,		Dentan, Enzabeth D.	0054

Beniga, Zosipat M.	0337	Bringas, D.	0568
Bernard, Henry	0051	Brion, Marco Alberto	0223
Bernardo, Allan Benedict I.	0210	Briones, Annabelle V.	0273
Bernardo, Severino T.	0497		0595
Bernardo, Valeree Ross R.	0599	Briones, Jonathan Carlo A.	0237
Bernardo-Lazaro, Ma. Rosario C.	0463	Brizuela, Nancy	0155
Bernido, Christopher	0165	Brondial, Yolanda	0293
	0524	Buaya, Anthony	0204
	0566	Bucol, A.A.	0395
Bersabe, M. J.	0491	Bucol, Abner A.	0180
Betty, Rowena Alma L.	0427		0312
Bilog-Obra, Glenda P.	0142	Buctuanon, Eugenia M.	0032
Binag, Christina A.	0249	Buena, Elizabeth Regina L.	0230
	0254	Buenaobra, Bernardino	0544
	0294	Buenavides, C.	0297
	0302	Buerano, Corazon C.	0471
	0590	Bugayong, M. G.	0491
Birginias, M. B.	0598	Bugayong, Monica G.	0272
Bisquerra, W.	0520	Bulaong, Manolito C.	0028
Black, Kenneth D.	0396		0030
Blanca, C. M.	0553	Bulos, Adelina DM.	0239
Blanca, Carlo Mar	0538		0270
	0544	Buot, Jr., I. E.	0279
Blanca, Carlo Mar Y.	0585	Bustos, Virginia B.	0287
Blanca, G. R.	0533	Caasi-lit, Merdelyn T.	0045
Blantocas, Gene Q.	0563		0065
Bo-ot, L.	0519		0114
	0559	Cabalda, Aegina B.	0374
Bognalbal, Eufrecina B.	0308	Cabalfin, Estelita G.	0378
Bondoc, Orville L.	0054	Cabalfin, Rizza Celina B.	0139
Bongga, Demetria C.	0434	Cabanilla, Ma. Corazon C.	0489
Bontia, Ponciano C.	0329	Cabello, Mark Kristan E.	0248
Bornales, Jinky B.	0570	Cabilla, Jazel J.	0368
Borricano, Jayne Nicholei C.	0176	Cabiscuelas, Maria Evelyne S.	0189
Botuyan, M.V.	0250	Cabral, Emmanuel A.	0408
Bourgoin, Thierry	0186	Cabral, Zenaida L.	0355
Brena, Susan R.	0109	Cabrera, Benjamin D.	0509
Bretana, Bryan Lloyd P.	0235	Cabus, Charles Erwin A.	0479

Caccam, Mabel	0015	Canja, L.H.	0014
Cada, Leonorina G.	0271		0095
Cadatal, Marilou M.	0547	Canlas, Louvell P.	0170
	0552	Canoy, Jr., Sergio R.	0409
	0577		0420
Cadiz, Nina M.	0211	Cansino, Percedita T.	0527
Cagauan, Arsenia G.	0055	Cantoria, Magdalena C.	0494
Caguete, Mayenee D.	0597		0510
Cajano, Mary Ann O.	0110	Cantorias, Melchor V.	0455
Calacal, Gayvelline C.	0467	Cantre, Melanie Aileen T.	0035
	0504	Cao, Ernelea P.	0174
Calaguas, Miriam Joy C.	0441	Capal, Teresita V.	0133
Calapardo, Marilou R.	0169	Capanzana, M.V.	0258
	0219	Capiña, Michael V.	0112
Calderon, Margaret M.	0592	Capiña, Verna Liza L.	0112
Calica, Gigi B.	0097	Capitan, S.S.	0116
Calilung, Maria Vibien J.	0203	Carandang, IV, Jose Santos	0223
Calilung, Venus J.	0077	Carandang, Jennelyn M.	0121
	0085	Cardona, Carmelita C.	0241
	0087	Caringal, Ma. Alegria T.	0508
	0113	Carino, F. A.	0229
Calinawan, Rogelio M.	0042	Carino, Stephen R.	0269
Calix, Virginia S.	0574	Caroy, Nelson Y.	0580
Calumpang, S. M. F.	0049	Carpena, Nathaniel	0216
Calumpong, Hilconida P.	0160	Carpio, Harry M.	0426
Cambel, Jenin	0306	Carpio-Bernido, Ma. Victoria	0165
Campita, Nora R.	0363		0524
Campos, Wilfredo L.	0129		0566
	0135	Carreon, S. L. M.	0550
	0400	Casareno R.	0250
Canal, Joecela N.	0176	Cascolan, Honorio L.	0114
Canda-Benigno, Carolyn	0005	Caseria, Estrella S.	0567
	0039	Casio Ramirez, Ray Kristoffer	0158
	0041	Castillo, Manuel L.	0353
	0046	Castillo, Priscilla B.	0097
Canete-Ranes, Liza I.	0125	Castor, J.L.	0282
Cang, Santi Rex	0175	Castulo, Rodierick	0305
Cangas, Kristine M.	0508	Catap, Elena S.	0190

Catedral, M. D.	0246	Chua, Kriesler William S.	0153
Cay-an, Recarte	0402	Chua, Modesto T.	0274
Cayabo, L.B.	0377		0275
Cayabyab, Bonifacio F.	0011	Cinco, Genneline F.	0321
	0013	Clado, Jeniffer M.	0488
	0024	Claveria, Rene R.	0261
	0050	Climaco, Maria Ivona F.	0256
	0061	Co Seng, Kristine L.	0467
	0086	Co, Dana Mae S.	0299
	0115	Cobacha, Marjorie M.	0321
	0278	Cobar, Ma. Lucia C.	0551
Cayabyab, Florante F.	0011	Codizar, Jihan D.	0539
Cayabyab, Pedro C.	0355	Coleman, Paul	0039
Celorico, Josefina R.	0497	Colting, Rogelio D.	0051
Cemine, Vernon Julius	0538	Concepcion, Danah Jean	0114
	0544	Corcega, Thelma F.	0512
Ceniza, Ma. Juliet C.	0029	Cordova, Karel J.	0290
Centar for Health Development,	0468	Coritico, Fulgent P.	0314
Southern Tagalog	0400	Coronado, Nancy B.	0053
Certeza, Hermogenes	0449	Corpuz, Israel Rhey	0204
Chakraborty, Soma	0255	Corpuz, Liwayway Hiyas M.	0173
	0260	Corpuz, Maricel	0183
	0274	Corpuz-Raros, L.A.	0090
	0275		0104
Chan, L.	0571		0609
Chan, L. C.	0586	Cortado, Hanna H.	0191
Chan, Merab A.	0199	Cortes, Dino Paolo A.	0215
Chang, Hui-Shung (Christie)	0089	Cortes-Maramba, Nelia P.	0442
Chato-Salvador, Ronelie	0062	Costas, Alled B.	0333
Chavez, Joel	0223	CPMN	0568
Chien, C.S.	0424	Creencia, Evelyn C.	0264
Chino, M.	0059		0596
Choo, Poh-Sze	0404	Cromey, Christopher J.	0396
Chouichom, Seksak	0084	Cruz, Christine A.L.	0501
Christensen, Guttorm	0383	Cruz, Crezzar German V.	0170
	0387	Cruz, Emilio M.	0324
	0393	Cruz, F. T.	0514
Chua, Charles Patrick B.	0343	Cruz, Jayvee G.	0457

Cruz, Libertado C.	0324	de Bruyn, M.	0330
Cruz, Ma. Cecelyn S.	0251	De Castro, Nenita L.	0089
Cruz, N.	0445	de Castro-Ontengco, Delia	0133
Cruz, Rafael B.	0449		0375
Cruz, Rex Victor O.	0592	de Dios, Rosanno JC	0311
Cruz, Rinella R.	0156	De Guzman, Aileen G.	0247
Cruz, Veriza Rita C.	0257	de Guzman, Jr., A. D.	0491
Cruz, Wilma T.	0138	De Guzman, Zenaida I.	0588
	0226		0591
Cruzado, Rhea Mii A.	0217	De Jesus, E.M.	0361
Cuaresma, Francisco D.	0300		0362
Cuaterno, Wilma R.	0050	de Jesus, Ma. Sheila M.	0150
	0086	de la Cruz, C. R.	0579
Cuevas, Virginia C.	0179	de la Cruz, Clarina R.	0523
Cui, Karina Milagros R.	0254	de la Cuesta, Lina C.	0497
Cuyegkeng, Ma. Assunta C.	0263	de Lara, Ayolani V.	0061
Daan, Leonilo G.	0497	De Leon, Dina	0442
Dagaas, Clarita T.	0089	de Leon, Marco P.	0342
Dagaerag, Liza-Fe L.	0539	De Leon, Marites S.	0588
Dagamac, Nikki Heherson A.	0139	de Leon, W. U.	0491
	0205	De Leon, Winifreda U.	0439
Dai, Shunhong	0122		0440
Daisog, B.	0297	De Leon-Aspra, Cathrina	0446
Dalafu, Haydee	0274	De Los Reyes, Beni	0175
Daquila, Robelyn E.	0033	De los Santos, Carolyn Y.	0261
	0035	De Luna, Jose T.	0425
Daquinag, Alexes C.	0215	De Mayo, Angeles	0005
Daroy, Maria Luisa G.	0470		0041
Datuin, Rogelio T.	0367	De Ocampo, Grace D.	0606
Daulog, Sayrha Pamela M.	0185	De Ungria, Maria Corazon A.	0467
David, Laura T.	0389		0504
David, Olga Marie C.	0606	de Vera, A. C.	0048
Davila, L. T.	0542	Decena, Ma. Carlota B.	0422
Dayaon, Jennyvi P.	0239	Dedeles, Gina R.	0154
	0270	Deere, Don U.	0292
Dayrit, Fabian M.	0496	Del Barrio, Marilyn C.	0169
Daza, M. R. H.	0548	Del Castillo, Lorena A.	0574
Daza, Marlon Rosendo H.	0547	del Norte-Campos, Annabelle G.C.	0135

	0379	Demayo, Cesar G.	0197
	0400		0200
del Rosario, E. J.	0246		0208
del Rosario, Edwin E.	0031		0222
del Rosario, Ernesto J.	0268		0224
Del Rosario, Wilfredo A.	0442		0368
dela Cruz, A. P. C.	0579		0474
dela Cruz, Aaron Paul C.	0523		0476
dela Cruz, Angelica	0244	Demonyo, Cesar G.	0193
dela Cruz, Arjelou C.	0415	Denoga, John Joseph L.	0153
dela Cruz, Arlen A.	0122	Deocaris, C. C.	0048
dela Cruz, Clifford	0216	Derico, Rajulla U.	0136
Dela Cruz, E.	0297	Descallar, Jenny	0271
dela Cruz, Fe M.	0551	Diaz, Ma. Genaleen Q.	0201
	0557	Diaz, Marie Manuelle C.	0189
Dela Cruz, Laurenz O.	0247	Dickson, Jonathan O.	0339
dela Cruz, M.S.	0092	Dico, Hermenigildo M.	0136
Dela Cruz, Rita T.	0334	Diesmos, A.	0279
dela Cruz, Roy Searca Jose P.	0303	Dillaha, Theo	0093
dela Cruz, Thomas Edison E.	0139	Dimaano, Maria Natalia R.	0299
	0173		0301
	0176	Dimacali, M.C.	0034
	0194	Dimaculangan, Julita G.	0121
	0204	Dimamay, Mark Pierre S.	0444
	0205	Dizon, Josefina T.	0017
Dela Cruz, Triah Joyce G.	0287	Dizon, Teodora O.	0031
Dela Fuente Dans, Leonila	0442		0065
dela Peña, Leobert	0191	Dolar, M.L.	0279
Dela Pena, Kristoffer C.	0153	Dolorosa, Roger G.	0384
dela Rosa, Alumanda M.	0378	Domingo, Albert Francis E.	0215
	0564	Domingo, Doreen D.	0212
Dela Rosa, Tammy	0472	Domingo, Estrelita O.	0212
Delfin, Evelyn F.	0016	Domingo, Jessica P.	0006
Delfin, Frederick C.	0504	Domingo, Lorna P.	0280
Delfin, Rita G.	0591	Domingo, Z. B.	0542
Delomen, Michael Leonardo C.	0201	Domingo, Zenaida	0271
Demafelis, Rex B.	0290	Dorado, Crisanto A.	0430
	0594	Du, Yihong	0405

Duazo, Paulita L.	0370	Espino, Maria Pythias B.	0262
Dumag, Rosemarie J.	0342		0267
Dumlao, G.	0533	Estacio, E.	0536
Duque, Johna C.	0122	Estacio, E. S.	0556
Duque, Ulysses G.	0122	Esteban, Anna San	0244
Duran, Emerenciana B.	0551	Estioko, L.P.	0004
	0557	Estoque, Mariano	0315
Dy, Danilo T.	0164	Estoque, Mariano A.	0319
Ebarvia, Benilda S.	0493	Estrada, Horacio R.	0495
Ebuenga, Melvin D.	0024	Estrada, Sylvia C.	0155
Edrada, Ru Angelie M.	0510	Estrella, Romulo R.	0251
Edradan, Gail Ruth R.	0217	Eugenio, A.D.	0361
Edradan, Maria Ruth R.	0217		0362
Elazegui, Erwin P.	0170	Eusebio, J. E.	0120
Elec, Venus H.	0066	Eusebio, Orlando L.	0079
	0099		0088
Elegado, Francisco B.	0169		0202
	0219	Fabros, Alden Ferdinand	0301
	0594	Facundo, Henry T.	0143
Elizalde, Ailyn C.	0327	Fajiculay, Erickson E.	0369
Ella, Victor B.	0093	Family Clusters in Brgys. Sayanan	0/68
Elmido, Visitacion V.	0380	& Mangangan	0+00
Elona, F.	0445	Fanuncio, Lady Jane C.	0144
Emralino, Francis Murillo	0589		0209
Endrina, Elizabeth B.	0475	Feliciano, Chitho P.	0257
Enerva, Lorna T.	0369	Feranil, Alan B.	0370
	0372	Fernandez, Cheryl Joy J.	0318
	0597	Fernandez, Jr., Pepito R.	0394
Enkiwe, Eudes B.	0075	Fernandez, M. S.	0562
Enriquez, Eliza B.	0557	Fernandez-Casim Lothy	0178
Enriquez, Erwin P.	0266	Fernandez-Casim, Lothy	0235
Escaner, IV, Jose Maria L.	0429	Fernando, E. S.	0279
Esguerra, Jose Perico	0555	Ferrer, Marilyn C.	0057
Esguerra, Jose Perico H.	0580	Ferrolino, Jose Brian A.	0161
Esmeris, Caryl Joy	0169	Filio, James M.	0497
Esperanza, Ramon C.	0595	Flauta, R.	0581
Espeso, E.I.	0513	Florentino, R.F.	0258
Espino, Jr., Armando N.	0303	Florentino, Rodolfo F.	0347

Florento, Leila M.	0168	Gao, Yongming	0098
	0206	Gaoat, Cecile A.	0117
Flores, Edgar D.	0033	Gapasin, Ruben M.	0003
	0035	Gapud, Victor P.	0003
Flores, Ester B.	0074		0018
Floresca, Apolonio R.	0355	Garcia, Beatriz R.	0054
Fontanilla, Ian Kendrich C.	0159	Garcia, C.P.	0513
	0174	Garcia, Christian Benedict R.	0305
Fontanilla, Ma. Regina C.	0478	Garcia, Edito G.	0509
Formentera, Mary Grace B.	0327	Garcia, Jerrold	0604
Francisco, Angelica D.	0447	Garcia, Jonyl L.	0248
Francisco, Ruben A.	0380		0256
Franco, Prima Fe R.	0117	Garcia, Lilian B.	0591
	0196	Garcia, Nissa Cheryl L.	0240
	0212	Garcia, Teofilo Y.	0551
Franco, Samuel S.	0056		0557
	0117	Garcia, W. O.	0517
	0196		0532
	0284		0583
	0295	Garcia, W.O.	0534
Frani, Alma M.	0504	Garcia, Wilson O.	0552
Franzblau, Scott G.	0482		0577
Fujihara, Tsutomu	0324	Garcia-Layaoen, Miriam	0108
Fukuyo, Yasuwo	0321	Gargar, Kim	0555
Fulo, Harris M.	0256	Gaspillo, Pag-asa D.	0242
Gabayno, J. F.	0517	Gaston, Czar Louie	0472
	0532	Gavino, Romeo B.	0056
Gabriel, Bernardo P.	0023		0300
	0143	Gayanelo, Phoebe	0224
Gagarin, M. A.	0307	Gayanelo, Phoebe Jean B.	0144
Galang, John Mark T.	0439		0192
	0440	Gecain, Ma. Kristina R.	0299
Galapon, E. A.	0569	Gemao, Beverly V.	0570
Galigao, Jr., Ronnie	0306	Gemzon, Irni Mark C.	0150
Galut, Christopher D.	0284	Genuino, Homer C.	0262
Galvez, Hayde F.	0073	Gergon, Evelyn B.	0003
Gambe, Jess E.	0572	Gervacio, Severino V.	0419
Gamboa, Leolina Remeceta M.	0153		0421

	0431	Guinto, Rosemarie M.	0460
Gervasio, Ricardo Noel R.	0174	Guison-Bautista, Ma Teresa Tricia	0485
Gevaña, Dixon T.	0349	Gutierrez, Charito A.	0074
	0352	Gutierrez, Jr., Pedro M.	0200
Gimin, R.	0221	Gutierrez, R. L.	0277
Gines, Michael O.	0040	Gutierrez, Redel L.	0040
Gleeson, Laurence J.	0039	Gutierrez, Rosemary M.	0233
Go, Carmelito E.	0420	Guzman, G.M.	0034
Golecruz, R. B.	0304	Guzman, Peter S.	0053
Gomez, Bryan C.	0054	Guzman, Ruth Marian S.	0174
Gomez, Edgardo D.	0146	Guzman-Natividad, Emylyn L.	0461
Gonzales, Christian	0274	Halos, Saturnina C.	0467
Gonzales, Lucas L.	0042		0504
Gonzales, Pablito G.	0050	Hangyo, M.	0578
	0061	Hangyo, Masanori	0582
Gonzalez, J. C.	0279	Hardy, Peter D.	0013
Gonzalez-Intal, Miren	0026	Hasebe, Futoshi	0471
Grafia, A. O.	0022	Hasika, Mith	0242
Granali, Justerie M.	0380	Hautea, Desiree M.	0053
Gregorio, Enrico G.	0317		0073
Gregorio, Glenn B.	0066	Hayakawa, Yoshinori	0291
	0099	Hayashida, Maki	0324
Griffiths, A. D.	0221	Haygood, Klaud Jenssen F.	0243
Gruezo, William Sm.	0114	Hayudini, Alicia Tangonan	0107
Guadalupe, Alvin P.	0027	Heatwole, Conrad	0093
	0082	Hedreyda, Cynthia T.	0151
Guerra, L. J. D.	0579		0191
Guerra, Leandro Jose D.	0575		0215
Guerrero, III, Rafael D.	0081	Henares, Terence G.	0263
Guerrero, III, Raphael D.	0228	Hermosa, II, N. P.	0548
	0401	Hernandez, Alyssa L.	0153
Guerrero, Luzviminda A.	0228	Hernandez, E.	0282
Guevara, B.Q.	0513	Herrera, Annabelle A.	0156
Guevara, Rowena Cristina L.	0287	Herrera, Kristine Joy M.	0350
Guiao, L.	0529	Herrera, M. S.	0048
Guillermo, Jr., Jose Gil	0223	Herrera, Marvin Ustaris	0589
Guillermo, Neil Raymund D.	0574	Higaki, Katsumi	0166
Guino-oII, Robert S.	0316	Hilomen, V. V.	0491

Hipolito, G.G.	0034		0559
Hirao, Gliceria A.	0047	Jondonero, Clowe	0368
	0143		0474
Hirono, Ikuo	0232		0476
Holdsworth, Clovia Isabel Z.	0259	Jorillo, Jr., Pablo A.	0587
Holdsworth, John	0315	Jose, Reizl P.	0157
Horaguchi, Takaaki	0264	Joshi, R. C.	0092
	0596	Joson, J. F.	0542
Hsu, Hao Yuhn C.	0248	Josue, Alexander David L.	0053
Hsu, Sze-Bi	0405	Josue, Danilo S.	0094
Huang, Ning	0006	Juanico, D. E.	0558
Hugo, E.	0307	Juanico, Dranreb Earl	0531
Ibarra, Jhoana Kim B.	0479		0543
Igarashi, Akira	0471	Judal, Maria Victoria L.	0003
Ignacio, L. M.	0048	Julian, Russell	0175
lizuka, Tomohiro	0264	Jumao-as, R. R. D.	0288
Imbag, Mark Dale S.	0247	Jumawan, Joycelyn C.	0190
Ingles, J.A.	0395	Jumawan-Nanual, Bernadette	0214
Inocencio, E. L.	0120	Kada, Ryohei	0237
Inofonada, V.F.	0250	Kajiyama, Tisato	0309
Inoue, Shingo	0471	Kalaw, Sofronio P.	0127
Isidro-Lapena, Josefina	0503	Kalim, Serjohn	0472
Islam, M.I.	0007	Kanazawa, S.	0059
Islam, N.	0007	Kanno, H.	0059
Ison, C. S.	0556	Karremans, K.	0546
Ito, T.	0059	Kasuya, T.	0581
Jaeger, Peter	0025	Katalambula, Hassan	0484
Jamias, Serlie B.	0017	Katimbang, Genaro A.	0061
Jamil, Ferdinand P.	0418	Kee Alfian, A. A.	0391
Jarilla, Flora A.	0032	Kelly, Michelle	0398
Javier, Anton Oliver M.	0173	Ken Busfield, W.	0259
Javier, Evelyn F.	0060	Khush, Gurdev S.	0006
	0071	Kim, Sung Min	0074
Javier, Francis O.	0470	Kimura, K.	0059
Javier, Ramon Jason M.	0503	Kirit, Noli Vergel E.	0539
Jeng, B.W.	0424	Kloppenburg, Robert Dale	0110
Jeyakumar, A.	0331	Koenigsberg, Stephen S.	0145
Jirkovsky, L.	0519	Kondo, Hidehiro	0232

Kosuge, Hitoshi	0293	Lavarias, Jeffrey A.	0035
Kuhn, Rudolf V.	0173	Lavilla, Ericson S.	0369
Kumar, K. K.	0336	Lavina, Shiela Marie	0503
Kumar, Sivanappan	0281	Lavina, Shiela Marie S.	0500
Kurup, B. M.	0332	Layaoen, Heraldo L.	0117
Kuzawa, Christopher	0370	Laylo, Glady Joyce C.	0016
Kwon, Taek-Ryoun	0211	Lazaro, Carla Frances M.	0466
Laag, Eleanor	0271	Lazaro, Jose Enrico H.	0508
Labastos-Ruetas, Lory D.	0487	Lazaro, Maria Eloisa R.	0451
Labendia, Mhelmar A.	0409	Lazarte, J. R. S.	0528
Lacdan, Ma. Camille	0540	Lee, Angela Lisandra S.	0260
Lacsa, Marinella C.	0290	Lee, Hyeon Ju	0074
Lacuna-Alip, Myrissa	0458	Lee, Jr., Henry V.	0540
Ladines, N. B.	0313	Lee, L. Y.	0391
Lagahid, Jose	0402	Legovic, Tarzan	0383
Lagman, Jr., Cirilo A.	0063		0387
Lagmay, Nora R.	0245		0393
Lagunzad, Daniel A.	0152	Leontyev, Dmitry V.	0205
Lahoylahoy, Lucilyn D.	0144	Leopando, L.L.	0377
	0192	Leopando, Leonardo S.	0357
	0209		0358
Laluan, Enrico M.	0349		0360
Lalusin, Antonio G.	0031		0365
Lam, Jacquiline C.	0134	Leung, Jonathan Mark S.	0150
Lambio, Angel L.	0089	Li, Hailiang	0417
Lanceras, Jonaliza C.	0006	Li, Ji	0253
Landagan, Ma. Cristina	0449	Li, Zhikang	0098
Lanto, Eduardo A.	0251	Libiran, R.	0307
Lapade, A. G.	0022	Licup, Albert	0566
Lapinid, Ezra Abigail C.	0302	Licup, Albert james	0165
Lapitan, Jr., Lorico	0244	Lim, Herb Ralston	0199
Lapitan, Jr., Lorico DS.	0298	Lim, May	0561
Larona, Ariel R.	0065		0584
	0353	Lim, S.	0285
Lasco, Rodel D.	0349	Lim, Wendy G.	0257
Latiza, Suzette A.	0114	Lim-Syllanco, C.Y.	0250
Laurena, Antonio C.	0031		0490
Laureta, Liberato V.	0062	Limpoco, Anna Guia O.	0464

Lin, Chi-Kun	0417	Machacon, E.L.	0116
Linatoc, Marlon L.	0041	Madamba, Ponciano S.	0028
Lingaling, Evangeline B.	0220	Madarang, Maricar Mae C.	0474
Lintongan, P. B.	0229	Madrid, Jordan F.	0239
Lirio, Lorenza G.	0220		0270
Lirio, Stephen B.	0482	Magallanes, M.	0286
Lisondra-Krings, Catherine	0478	Magat, S.S.	0014
Lit, Jr., Ireneo L.	0045		0095
	0065	Magcale-Macandog, Damasa	0602
	0118	Maghirang, Rodel G.	0454
Litong, Marisciel	0291	Magistrado, Virna Liza L.	0305
Liwag, J. W. F.	0546	Maglasang, Gibson T.	0570
Llaguno, Ma. Tessa A.	0112	Maglinao, Amado R.	0126
Llano Maria Corazon T.	0449	Magluyan, Virginia B.	0348
Llarena, Elaine C.	0046	Magno, Francisco A.	0146
Lluisma, Arturo O.	0148	Magno, Michelle M.F.	0504
Longakit, Ma. Belinda A.	0398	Magpantay, Gerard B.	0006
Lontoc, D.	0307	Magpantay, Ruth Berry O.	0189
Lope, Jose Ernie C.	0429	Maguinsay, Carol Socorro	0209
Lopez, Nellie C.	0390	Malabanan, Frisco M.	0109
Loterina, Roel A.	0527	Malabanan-Manipol, J.	0120
Lozada, Marissa B.	0511	Malabayabas, B.	0048
Lubrica, Jonathan A.	0415	Malabayabas, Ma. Luz L.	0089
Luchavez, Loida F.	0327	Malaborbor, Pastor B.	0372
Luczon, Adrian U.	0159		0597
Lumeran, Belen T.	0185	Malanon, Hernaiz G.	0097
Lumibao, Candice Y.	0151	Malaria Control Team, Mindoro	0468
Luna, Amelita C.	0230	Oriental	0408
	0350	Malicdem, Criselda	0468
	0354	Malijan, Frederick M.	0256
Lustre, Alicia O.	0064	Mallari, Jr., Vicente C.	0123
Luz, Mark Anthony D.	0444	Mallillin, Armando T.	0595
Mabini, Marilyn C.	0414	Mamaril, Augustus C.	0231
Macabeo, Allan Patrick G.	0482		0236
Macadangdang, Jr., Romulo R.	0249	Mamauag, John Carlo A.	0150
Macapinlac, Manuel P.	0492	Mamauag, Samuel	0328
Macaranas, Federico M.	0146	Manalabe, Ruben E.	0027
Maceda, Gerald A.	0346		0033

	0035
	0082
Manalo, Carmelita O.	0253
Manalo, Christopher G.	0479
Mangalindan, Nora B.	0588
Mangubat, Rey Sergio A.	0448
Manguiat, Proceso H.	0031
Maningas, Mary Beth Bacano	0232
Mantala, M.	0445
Manting, Muhmin Michael E.	0193
	0197
Manyzo, M.	0059
Manzano, Ma. Carla	0565
Mapua, Cynthia A.	0470
Maquila, Robelyn E.	0082
Maraña, B. D.	0517
Maratas, Jan Mickelle V.	0459
	0515
	0549
Marbella, L. J.	0022
Marcelo, Denisse Marie A.	0176
Marciano, Jr., Joel Joseph S.	0311
Marcos, Ma. Sheila Angeli	0545
Marero, L.M.	0258
Margate, Dante E.	0557
Maridable, Julius B.	0242
Marin, Eduardo M.	0588
Marquez, Agnes I.	0439
	0440
Marquez, Mario M.	0051
Martin, E. C.	0092
Martin, Mary C.	0415
Martinez, Czarina Cherizze	0204
Martinez, Romualdo C.	0033
	0035
	0082
Martinez-Goss, Milagrosa R.	0149
Masalunga, Marvin C.	0177

Masilungan, Gloria D.	0027
Masmoudi, Nader	0417
Mateo, A. B.	0048
Mateo, Javier P.	0044
Mateo, N.	0598
Mather, P. B.	0330
Matias, Ronald R.	0168
	0206
	0444
	0471
Matibag, Jela Patricia R.	0479
Matining, Eric	0306
Mazaredo, A.M.	0101
	0102
Meñez, Lambert Anthony B.	0389
Medalla, Felipe M.	0601
Medina, M. J. B.	0049
Mejia, Belen S.	0029
Melo, Catherine L.	0252
Mena, M. G.	0304
Mendiola, April Shower M.	0301
Mendioro, Merlyn S.	0069
	0098
	0201
Mendoza, Ana Marie B.	0597
Mendoza, Earl Anthony	0311
Mendoza, Evelyn Mae T.	0031
Mendoza, Herman D.	0310
Mendoza, L.F.	0361
	0362
Mendoza, M. T.	0445
Mendoza, Maresciele G.	0006
Mendoza, Rhulyx	0066
-	0099
Mendoza, Sheila Mae	0175
Mendoza, Teodoro	0015
Mendoza, Teodoro C.	0094
Mercado, Margarita A.	0219
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Mercene-Mutia, Ma. Theresa	0326	Mindoro Oriental	
Merino, Dennis I.	0412	Musico, Janina C.	0175
Metillo, Ephrime	0218	Mustafa, S.	0341
Metillo, Ephrime B.	0214	Mutia, W. G.	0289
	0373	Nable, Job A.	0413
Mew, Teresita V.	0006	Nabuab, Fenelyn M.	0129
Mewis, Inga	0019		0379
Miao, Adones G.	0333	Naegel, L.C.A.	0101
Migita, M.	0578		0102
Migo, Veronica P.	0187	Naelga, Jacklyn G.	0476
	0594	Naguit, Ma. Rio A.	0160
Miranda, Lorena N.	0027	Nahar, M.S.	0007
Miranda, Ronalyn T.	0122	Nair, V.S.K.	0608
Mitsumoto, Ikuro	0388	Namia, M.T.I.	0004
Mituda-Sabado, Emma C.	0113	Nanba, Eiji	0166
Mizuno, N.	0059	Nas, Tamerlane Mark S.	0069
Mohagan, Alma B.	0158	Nashima, S.	0578
Mohan, R.	0221	Natividad, Filipinas F.	0444
Monleon, Arnolfo M.	0010		0470
Monlinong, Jason Paul	0240		0471
Monlinong, Jason Paul	0272	Natividad-Pasion, Ann Marie	0410
Monlinong, Jason Paul C.	0433	Navasero, Marcela M.	0047
	0437	Navasero, Mario V.	0047
Monsada, A. M.	0313		0077
Monsalud, Rosario G.	0191		0085
Montañez, Joemon O.	0016		0087
Montenegro, M.M.	0034	Nawang, Salasa A.	0459
Monterola, C. P.	0558		0515
Monterola, Christopher	0543		0549
Morales, Marienette B.	0530	Negre-Pareja, Mildred C.	0473
Morallo-Rejesus, B.	0120	Nemenzo, Fidel R.	0427
Morallo-Rejesus, Belen	0142	Nepomuceno, Jovellyn Shara F.	0597
Morente, Carlo Paul P.	0549	Ngojo, Lailanie Angela A.	0299
Morita, Kouichi	0471	Nguyen, Viet D.	0293
Movillon, Jovita L.	0290	Nobuya Mizoue, Kazuo Ogata	0325
	0594	Noguera, V. R.	0525
Muga, II, Felix	0604	Nolasco, Jr., Jose C.	0150
Municipal Health Office, Saco,	0468	Nonato, M.G.	0513

Nozaki, K.	0568	Osikoya, O. J.	0172
Nuneza, Olga M.	0178	Otadoy, Roland	0165
Obias, E. R.	0576		0524
Obien, Santiago R.	0003		0566
Oblefias, Wilma R.	0526	Otani, Mitsuharu	0428
	0573	Ouano, D.	0259
Oblepias, Virgilio R.	0483	Oyong, Glenn G.	0137
Ocampo, A.M.	0059	Pablico, Sosimo MA.	0001
Ocampo, Pablo P.	0163		0072
Ocampo, Virginia R.	0163	Pacada, Charles A.	0371
	0469	Padilla, Carlos L.	0013
Ocite, Myla	0216		0024
Oclarit, Jose M.	0132	Padilla, Larry V.	0392
Oconer, Edna P.	0181	Padua, Joyce Ann M.	0016
Ohachi, T.	0581	Paglicawan, M. A.	0313
Olbinado, Margie P.	0575	Palabrica, Maria Luisa D.	0470
Olivares, Ryan U.	0239	Palad, Lorna Jean H.	0551
	0270	Palero, J. A.	0534
Olivera, Baldomero M.	0167	Palerud, Rune	0383
	0188		0387
Olojo, E. A. A.	0172		0393
Olurin, K. B.	0172	Palima, Corbelita J.	0238
Omura, Takuo	0321	Paller, G. V.	0491
Ong, Perry S.	0146	Palmes-Saloma, Cynthia P.	0184
	0159		0489
Ongluico, Niño Paolo T.	0217	Palmos, Denice Mae	0508
Ontengco, Delia C.	0251	Palypayon, Concepcion M.	0012
	0488	Pampolina, Nelson M.	0162
Opina, Louricha A.	0435		0353
Opiso, Earl M.	0281	Panes, Vivian A.	0175
Opiso, Einstine M.	0296		0183
Oracion, Enrique G.	0316	Pangan, Abigail Clarice G.	0132
Orcajada, Marivel	0338	Panganiban, Gilbert C.	0369
Orden, Edgar A.	0324	Panisan, Alfie C.	0195
Ordonez, Ishmael S.	0269	Papa, Donna May D.C.	0150
Orosko, E.A.	0568	Papa, Irene A.	0207
Ortin, Erlinda L.	0453		0217
Ortiz, Sheila M.	0375	Papa, Rey Donne S.	0237

Papag-Cruz, Rocela B.	0147	Perez, Aurora E.	0502
Paragas, Danika Jade S.	0247	Perez, Cirila T.	0399
Paragas, Danila S.	0040	Perez, Emma A.	0067
	0247	Perez, Emma P.	0024
Paraguison, Rubigilda C.	0074	Perez, Keneth P.	0406
	0166	Perez, Myleen Claire P.	0176
Parao, Marissa R.	0351	Perlas, Leah A.	0344
Parco, Arnold A.	0006		0345
Paredes, Fiona U.	0599	Perry, Brian D.	0039
Pareja, Andre Joseph	0199	Petilla, Kimberly Anne	0204
Parohinog, Jr., C. K.	0288	Phommasoulin, Vanthieng	0017
Parra, Christian M.	0173	Phuong Ha, Huynh Ky	0242
Parreño, Paul Erwen T.	0318	Piagola, Joy Cristy S.	0572
Pascua, Joel	0114	Pilares-Cruz, Ma. Victoria	0485
Pascual, Artemio E.	0276	Pile, Clarenda P.	0003
Pascual, Carlos M.	0196	Pillas, Michael Joseph SM.	0349
Pascual, Cherrie B.	0240	Piquero, Ronald E.	0567
	0272	Pitchai, M. A.	0331
	0433	Platon, Rolando R.	0340
	0437		0397
	0455	Pobre, R. F.	0535
Pascual, Cristina L.	0564	Polinar, Anatolio N.	0354
Pasumbal, Ramelo A.	0399	Ponce, Y. D. M.	0528
Pateña, Lilian F.	0121	Pondoc, Dionesio C.	0310
Paterno, Erlinda S.	0016	Portilla, Ma. Cristina B.	0240
Patricio, Marilyn G.	0002		0272
Paunlagui, Merlyne M.	0322		0433
Payawal, Pacifico C.	0124		0437
Peñalba, Fredelino	0011		0455
	0024	Portugal, Teresita R.	0342
Pedemonte, Gerold	0584	Pradeep, A. R.	0608
Pedregosa, R.V.	0377	Predicala, Rey Z.	0470
Penalba, Fredelino P.	0061	Primavera, Karlo	0381
Penalba, Linda M.	0322	Provido, Noel T.	0068
Peneyra, Ruel Garabiles	0300	Provincial Health Office, Mindoro	0169
Penolio, Lutgarda	0328	Oriental	0408
Perdigon, Henry B.	0467	Publico, A.	0286
Perdon, Liza Rowena DLC.	0594	Pulhin, Florencia B.	0349

Pulhin, Juan M.	0592	Raj
Pulido, Marian A.	0182	Raj
Pumanes, Maria Consuelo B.	0499	Ras
Pundavela, Menchie R.	0380	Ray
Punzalan, Bill Vincent D.C.	0415	Ray
Quema, A.	0578	Ra
Quesada, Maria Gabriela B.	0294	Rea
Quiñones, Catherine Therese J.	0515	
Quilang, Jonas P.	0159	Re
Quimbo, Maria Ana T.	0322	Ree
Quimio, Celsa A.	0066	Reg
	0099	Re
Quimio, Gorgonio M.	0114	Reg
Quimio, Jr., Marcos J.	0042	
Quintana, Ernesta G.	0454	
Quiroga, Reuben	0565	Rel
Rañoa, Diana Rose E.	0151	Re
Rabara, Roel C.	0057	
Racadio, Charles Darwin T.	0257	Re
Ragasa, Consolacion Y.	0242	Rei
Rahman, M.S.	0007	Re
Rahman, R. A.	0341	Ret
Ramirez, Bernadette L.	0234	Re
Ramirez, Teresita J.	0225	Re
Ramiro, Katherine M.	0474	Re
Ramos, Alejandro F.	0363	Re
Ramos, H. J.	0525	Re
	0528	Re
	0562	Re
Ramos, Henry	0540	Re
Ramos, Henry J.	0563	Re
Ramos, John Donnie A.	0153	Re
	0479	Rit
Ramos, Rei Karlo A.	0212	Ric
Ramos, Rolando E.	0430	Rig
Ramos, Solita P.	0442	Rir
Randolph, Thomas F.	0039	
Ranola, Rey Alfred G.	0243	

Raposa, Blessilda P.	0431
Rapusas, Maribel dR.	0054
Rasco, Jr., Eufemio T.	0130
Ravago, Majah-Leah V.	0106
Rayco-Solon, Pura	0374
Raymundo, Asuncion K.	0145
Real, J. G.	0101
	0102
Recio, B.V.	0513
Recuenco-Adorada, Jessamyn D.	0018
Regalia, Raymond S.	0148
Regis, Emelina G.	0152
Regpala, Regie	0383
	0387
	0393
Rehatta, Beatrix M.	0160
Relleve, Lorna S.	0257
	0564
Rellosa, Mara A.	0261
Renegado, Jessica G.	0476
Reniva, Christofer R.	0372
Retula, M.	0445
Revelo, Renamar N.	0198
Reventar, Mary Rachel	0216
Rey, Jessica D.	0098
Reyes, Gian Carlo P.	0433
Reyes, J. J. C.	0520
Reyes, Jocelyn P.	0497
Reyes, Manuel R.	0093
Reyes, Marita V.T.	0155
Reyes, Renato G.	0127
Reyes, Salvador F.	0292
Ribaya-Mercado, Judy D.	0374
Rideout, John A.	0242
Rigor, Alex T.	0070
Rimando, L.C.	0090
	0104
	0105

Rimas, Ma. Filipina M.	0163	Salabit, Ma. T.A.	0362
Risonar, Maria Grace D.	0374	Salazar, A.	0297
Ritumalta, Mark Noe C.	0206	Salazar, Artemio M.	0020
Rivera, Jesusa M.	0060	Salazar, Joel R.	0040
Rivera, Tolentino	0122	Salcedo, Mary Joy L.	0154
Rivera, Windell L.	0131	Saldaña, Rafael	0604
	0177	Salic-Hairulla, Monera	0136
Rivero, G. C.	0229	Saloma, C.	0553
Robil, Jan Lorie M.	0171	Saloma, C. A.	0535
Rodillas, Coleen P.	0173		0558
Rodolfo, Kelvin S.	0359	Saloma, Caesar	0531
	0366		0538
Rodrigo, Peter John	0561		0543
Rodriguez, Irene B.	0267		0544
Rodriguez, M.J.B.	0004		0545
Rola, Agnes C.	0146		0561
Rolluqui, G. V.	0288	Saloma, Caesar A.	0526
Romallosa, Kristine Marie D.	0364		0573
	0567		0585
Romano, M. S.	0289	Salunga, Thucydides L.	0190
Romualdez, Jr., Alberto	0436	Salvador, A.	0529
Ronquillo, D.G.	0282	Salvador, A. A.	0520
Ronquillo, J.	0286		0536
Ronulo, J.	0533		0556
Rosagaron, Roman P.	0385	Salvador, Amelita R.	0097
Rosario, Leo Mendel	0540	Samonte, H.P.	0043
Rosario, Leo Mendel D.	0518		0059
Ross-Degnan, Dennis	0500	Samson, E. C.	0553
Roxas, Jennifer L.	0151	San Diego-McGlone, Maria	0381
Rufila, Lilibeth V.	0227	Lourdes	0381
Ruiz, Roberto L.	0499		0382
Sacro, Cecilia M.	0446		0392
Saguibo, Jennifer D.	0219	San Juan, Mari Des J.	0198
	0225	San Luis, Boris B.	0151
Saises, M.C.	0258		0191
Sajise, Andy G.	0066	Sanchez, Geoffrey P.	0114
	0099	Sangalang, Ma. Angelica B.	0597
Sala, Leo Albert G.	0275	Santiago, Alejandro E.	0388

Santiago, Dante R.	0023	Seboline, Aldwin	0372
	0047	Secretario, R.	0288
Santiago, Evangeline C.	0276	Sedano, Susan A.	0225
Santiago, Karen S.	0243	Seidenschwarz, Franz	0607
	0343	Sembrano, Lawrence N.	0446
Santiago, Katherine	0168	Serafico, Michael E.	0344
Santiago, Krystle Angelique A.	0176	Sergio, M.F. Hassan A.	0386
Santin, Corazon A.	0060	Sevilla, III, Fortunato	0243
	0071	Sevilla, III, Fortunato B.	0343
Santos, I. S.	0022		0493
Santos, Imelda J.	0039	Shaw, Sen-Yen	0411
	0052	Shinohara, M.	0568
Santos, Jordan	0127	Shirakawa, Hideki	0265
Santos, Josefina C.	0005	Sia Su, Glenn L.	0134
	0041	Sia, Bettina	0437
Santos, Joyce Gayle R.	0498	Siao, Winnie P.	0478
Santos, Kharla Jane L.	0154	Siar, Simeona V.	0110
Santos-Ocampo, Carlo D.	0443		0121
Sapin, Arsenia B.	0225	Sicam, V. A.	0546
Sapin, Gelyn D.	0114	Sicam, Victor Arni	0537
Sarian, Z. B.	0036	Silvestre, Vivian A.	0206
Sarmago, R.	0533	Simbik, Made	0402
Sarmago, R. V.	0246	Simon, Samuel R.	0600
	0289	Simpliciano, Rolayson C.	0140
	0520	Singh Shah, Geeta C.	0154
	0579	Singh, Rakesh K.	0069
Sarmago, Roland V.	0521	Singh, Rakesh Kumar	0066
	0523		0099
	0575	Singh, Sarnam	0213
Sarmiento, R.	0529	Singh, Tarun P.	0213
Sastine, Vera Marie	0538	Siringan, Fernando P.	0359
Sastrouno, Soetikno	0086		0366
Sato, Tsutomu	0296	So, Ruby Haizeline S.	0198
Saturno, J. O.	0277	Sogono, Paolo G.	0139
Sawada, Yasuji	0291	Soliban, Jr., Luis	0096
Sawal, Leonardo C.	0305	Soliman, Victor S.	0386
Schoppe, Sabine	0384	Solis, Angeline Dawn E.	0154
Seares, Ken Bryl T.	0016	Solis, Michael Jay L.	0194

Solon, Florentino S.	0374	Tacadena, Mancielito	0119
Solon, Juan Antonio A.	0374	Tacio, Henrylito D.	0009
	0439		0037
	0440	Taclan, Lorcelie B.	0056
Sombrito, Elvira Z.	0239	Taguba, Cyril A	0164
	0270	Tajuddin, B. H.	0391
Somintac, A.	0529	Takeda, Shohei	0484
Somintac, A. S.	0536	Talampas, Marc Caesar	0311
Soniega, J.A.	0004	Tamayo, J. P.	0246
Soria, Janneli Lea A.	0359	Tampus, Christie G.	0327
Soriano, Joventino D.	0238	Tan Gana, Neil H.	0175
Soriano, Maricor	0545		0183
Soriano, Maricor N.	0526		0198
	0573		0199
Sotto, Filipina B.	0398	Tan Torres, T. T.	0445
Srinivasan, Raghavan	0093	Tan, Cheriss	0372
Sta. Isabel, Jamie Anne O.	0195	Tan, Raymond	0293
Sta. Maria, Efren J.	0239	Tan, Raymond R.	0283
	0270	Tanalgo, Krizler C.	0235
Suarez, Lady-Anne C.	0444	Tanduyan, Serapion N.	0327
Subade, Ana Liza A.	0320		0329
Subade, Rodelio F.	0318		0333
	0320	Tangol, Bernard John V.	0256
Subudhi, Prasanta K.	0006	Tansinsin, Lilia G.	0363
Sulabo, Evangeline C.	0280	Tapia, A. K. G.	0246
Sultan, M.K.	0007	Tarriela, A.D.	0286
Sumagaysay, Charity Joy L.	0141	Tarroja, Manuela Fe H.	0537
Sumagaysay, James B.	0141	Tayco, Crimson C.	0148
Sumagaysay-Abantao, Marilyn	0456	Tejada, A. W.	0049
Sumalde, Augusto	0050	Telan, Giovanna Janina D.	0256
Sumera, Florentino C.	0269	Tengco, Lorena W.	0374
Sy, Polly W.	0428	Teodoro, Katrina B.	0261
Tañedo, Jr., Eugene Vernon V.	0193	Teves, Franco G.	0178
Tabaranza, B.	0279	Thang, San H.	0259
Tabbada, Kristina A.	0504	Thanh Sang, Dinh	0325
Tablizo, Francis A.	0148	The fish genetics breeding	o 1 -
Tabora, John Aries G.	0235	program-genetic manipulation for	0156
Tabugo, Sharon Rose M.	0222	mproved mapia project	

The PNA-DOH Rifasaf collaborators	0505	Torres, Rosalinda C.	0251
Thinh, L.V.	0221		0252
Thomas, Joice V.	0332	Trinidad Lorele C	0187
Tiamson, Ma. Elena B.	0470	Trinidad, Oscar R	0595
Tiglao-Lim, Maria Poncesca	0450	Trio Phoebe Z	0345
Tigno, Xenia T.	0447	Trocino, Bianca Beatriz V	0508
Ting, Julie Anne	0540	Tu. Shih-Tong	0416
Tiongco, Emmanuel R.	0122	Tuaño. Elena R.	0168
Tiongson, Lainie C.	0339	Tuazon, Alexander O.	0168
Tisca, J.	0297	,	0206
Tisera, Wilson L.	0160	Tubal. Genelita B.	0315
Tobias, Sheryl S.	0470	Tuballa, Tracy	0540
Toledo, Aquinas Hyacinth G.	0243	Tulod, Adrian M.	0354
Tolentino, Jr., Enrique L.	0354	Tumabiene, Lea A.	0380
Tolentino, Vivian S.	0171	Tumampil, Kara Regina S.	0368
	0175	Tumbocon, Anthony J.	0497
Tongco, Gina Rose	0522	Tumlos, Roy	0540
Tongol, Bernard John	0244	Tumlos, Roy B.	0518
Tongol, Bernard John V.	0248	Uban, Rechelle G.	0185
	0298	Ubando, Isaiah	0493
Tongson, Eden Jane U.	0073	Udani, Cherry Anne M.	0208
Tordesillas, Dino T.	0237	Uddin, R.	0007
Torino, Hanna Nikka L.	0189	Ulanday, Joselita Rosario C.	0344
Torres, Andrew F.	0159		0345
Torres, L. D.	0277	Ulep, R. A.	0598
Torres, Maria Leilani Y.	0552	Ulep, Roque P.	0140
	0577	Ulrichs, Christian	0019
Torres, Mark Anthony J.	0193	Umnat, Prajate	0354
	0197	Uy, Abigail Loren T.	0183
	0200	Uy, Cheston	0223
	0208	Uy, Frederick A.	0132
	0222	Uy, Joselito A.	0432
	0224	Vacalares, Kayrol Ann B.	0516
	0368	Valarao, X.C.	0286
	0474	Valderama, Ma. Theresa G.	0439
	0476		0440
Torres, Ronald Allan R.	0470	Valdez, Conrado A.	0507

Valencia, M. A.	0598	Villanueva, Reagan Joseph T.	0607
Valencia, Marshall N.	0480	Villaraza, Balthazar	0452
Valera, Jaime B.	0026	Villarin, Angelito D.	0333
Valera, Madeleine R.	0500	Villarin, J. T.	0514
Valera, Nestor S.	0261	Villarin, SJ, Jose	0315
Valiente, Bonnie M.	0109	Villarta, Karen A.	0135
Valles, Brigette Anne C.	0195		0400
Vallesteros, Arvin P.	0592	Villaruz, Lara Gay	0524
Vallesteros, Shierel F.	0356		0566
Van Hove, Charles	0055	Villegas, Lina G.	0228
Varca, L. M.	0049	Villegas-Pangga, Gina	0083
Vasantha, L.	0331	Villorente, L. M. M.	0525
Velez-Tirante, Glenda	0452	Viloria, Jimmy V.	0412
Veluz, A.M. S.	0022	Viloria, Wryan Quiel Z.	0033
Vencer-Malaluan, Angeles	0456	Viray, Angeline S.	0590
Vequizo, Reynaldo M.	0516	Viray, Donna Marie C.	0290
	0572	Virtucio, Carina P.	0100
Vera Cruz, Carlos M.	0016	Virtudazo, Raymond V.R.	0284
Vera Cruz, Casiana M.	0098	Vital, Pierangeli G.	0131
Verar, Jr., Wilfredo M.	0206	Vitug, Lawrence D.	0237
Vereña, Roderic	0097	Wada, M.	0581
Vergel de Dios, Ariel	0472	Wagner, Anita K.	0500
Verin, Blesilda	0005	Wang, Edward HM	0481
	0041	Wang, Pin-Yu	0416
Viagedor, Ruel	0306	Wang, Yuehong	0482
Victorino, Francis Gabriel	0311	Webb, Raymond F.	0039
Vilela, Jocelyn P.	0406	WesPac Observation Groups	0568
Villacarlos, Lina T.	0029	White, Patrick	0382
	0076		0383
Villagonzalo, Cristine	0522		0387
Villagonzalo, Cristine R.	0530		0393
Villanoy, Cesar	0381	Wong, Han-Jin	0411
Villanoy, Cesar L.	0389	Wu, Analiza C.	0591
	0403	Xu, Jianlong	0098
Villanueva, A.	0586	Yamao, Masahiro	0084
Villanueva, Keith Michael A.	0275	Yambao, Enrico M.	0422
Villanueva, Merle A.	0251	Yap, Sheryl A.	0186
	0253	•	0353

Yap-Dejeto, Leni G.	0321
Yaptenco, Kevin F.	0027
Yau, Shueh-Lin	0298
Yong Seok Kian, A.	0341
Yousif, O. M.	0336
Ysrael, Mafel C.	0241
Yu, William	0604
Yu-Maglonzo, Eva Irene	0485
Yumoto, K.	0568
Yumul, Jr., Graciano P.	0367
Yun, Han Dae	0138
	0226
Yusuf, Y. B.	0391
Zafaralla, Macrina T.	0237
Zafra, Racquel G.	0155
Zamora, Prescillano M.	0227
Zarate, Jocelyn T.	0161
	0195
Zompro, Oliver	0079
	0088
	0202
Zulaybar, Teofila O.	0189
	0207
	0217

#### SUBJECT INDEX

α-tocopherol	
Spectrophotometric analysis of $\alpha$ -tocopherol using emeraldine film	0272
κ-carrageenan	
Metal absorption capacities of $\kappa$ -carrageenan blends	0263
137Cs reference source	
Sensitivity of radiation monitoring systems in Manila Ports in detecting contamination in foodstuff shipments	0567
2-nitrobiphenyl, 2-	
Microwave-assisted cadogan reaction: its application to synthesis of heterocyclic compounds	0264
41Ar effluent	
AR_DOSE: a PC program for stack design and the PRR-1 41Ar effluent	0357
60Co gamma radiation	
Radiation-modified natural polymers for biomedical applications	0564
74.2S.Ha Magnetic properties	
Differentiating AC and DC field effects on the magnetic susceptibility of bulk $YBa_2Cu_3O_{7-\hat{1}'}$	0521
74.62c Transition temperature variations	
Differentiating AC and DC field effects on the magnetic susceptibility of bulk $YBa_2Cu_3O_{7-\hat{l}'}$	0521
74.72.Bk Y-based cuprates	
Differentiating AC and DC field effects on the magnetic susceptibility of bulk $YBa_2Cu_3O_{7-\hat{l}'}$	0521
A line	
Seed quality response to fungicide treatment of a line and F <sub>1</sub> hybrid seeds	0109
Abaca	
Development of Philippine tropical fabrics from indigenous sources	0588
Abaca (Musa textilis Nee.)	
Development of high yielding and bunchy top virus resistant abaca ( <i>Musa textilis</i> Nee) cultivars	0031
Abaca bunchy top virus (ABTV)	
Development of high yielding and bunchy top virus resistant abaca ( <i>Musa textilis</i> Nee) cultivars	0031
Abaca fibers	
Development of high yielding and bunchy top virus resistant abaca ( <i>Musa textilis</i> Nee) cultivars	0031

ABO	
Frequency distribution of blood groups ABO, MN and Rh factor in Philippine cosmopolitan, regional, and the national populations	0174
Absorption method	
An optical remote sensing system based on molecular absorption spectroscopy: I. optical arrangement	0560
Acacia mangium	
Utilization of acacia mangium for cement-bonded board manufacture	0123
Acacia trees	
Occurrence of corticolous myxomycetes from acacia trees ( <i>Samanea samans</i> Merr) collected from different sites in Luzon Island, Philippines	0205
Acari	
A checklist and host index of Philippine mites (acari) associated with arthropods	0609
Acetate	
Evaluation of the effectiveness of fabric stain removers	0591
Acid peptic disease	
A new look at heterophyidiasis (intestinal fluke infection): a food-borne parasitic zoonosis in the Philippines	0491
Acid-fast bacilli	
The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0439
Actenoides hombroni	
Genetic variability within the population of the vulnerable Mindanao endemic Blue- Capped Kingfisher ( <i>Actenoides hombroni</i> ) using polymorphic DNA markers	0178
Activated carbon	
Optimization of <i>Jathropha curcas</i> (tubang bakod) and <i>Calophyllum inophyllum</i> (bitaog) as a viable source of activated carbon for methylene blue adsorption	0299
Acupressure	
Complementary alternative medicine usage among diabetic patients of Ospital ng Maynila Medical Center from January 2004 - June 2005	0450
Acupuncture	
Application of non-conventional acupuncture in sheep, cattle and water buffaloes	0605
Complementary alternative medicine usage among diabetic patients of Ospital ng Maynila Medical Center from January 2004 - June 2005	0450
Acyclic diamide	
Rapid synthesis under mild conditions of an acrylic diamide N, N, N', N'T etrabutylphthalamide, a potential antimicrobial agent	0599
Adaptability traits	
Bioeconomics of native pig production in Marinduque	0010
--	------
Adaptation	
Physiological signaling and adaptation processes to drought and salinity stress interactions in rice	0211
Ades albopictus	
Growth patterns and infectivity of a dengue-2 virus strain propagated in the human myelomomocytic cell line K562	0471
Adoption	
Comparative analysis of coffee farming practices introduced by government and the private sectors in Paksong District, Champasak Province, Lao PDR	0017
Adsorption	
Optimized extraction of $H^{\hat{a}\in}$ by three-electrode faraday cup system in magnetized sheet plasma ion source	0562
Adult Ambulatory Care Unit (AACUIAMBU)	
Pranic healing as adjunct treatment in functional dyspepsia	0499
Aethriamanta subsignata	
An annotated checklist of the dragonflies of Cebu Island, the Philippines with notes on conservation	0607
Affine transformation	
On the hausdorff dimension of sierpinski carpets	0426
AFM	
Preparation and investigation of spin self assembled multilayer film of poly(3,4 ethylenedioxythiophene): poly(4 styrenesulfonate) and poly(alylamine hydrochloride) as organic light-emitting diode	0302
Agalactia	
Diagnosis and control of porcine epidemic diarrhea: case report	0034
Age determination	
The modified horn ring method as a tool in determining the age of carabao	0606
Agricultural biotechnology	
Agricultural biotechnology trends and challenges	0130
Agriculture	
2 more private rice hybrids for wider farmers' choice	0001
Adaptability and management of vegetables legumes and cereals in ashfall and lahar areas	0002
Alternative management strategies against the rice root-knot nematode, <i>Meioidogyne graminicoia</i> in rice-onion system	0003
Analysis of genetic diversity in coconut by RAPD	0004
Antibody titer response of cattle (Bos taurus) vaccinated with oil and aluminum adjuvanted FMD vaccine (Serotype $O_2$ , $A_{24}$ and $C_3$ )	0005

The application of molecular marker-assisted selection in rice breeding	0006
Assessment of economic losses caused by coconut mite through farmers': participatory research appraisal	0007
ASU to produce biodiesel from waste fats	0008
Balimbing: a fruit with myriad uses	0009
Bioeconomics of native pig production in Marinduque	0010
Butterfly manure: a novel source of bio-organic fertilizer	0011
Cactus: nature's phytochemical specialist	0012
A checklist of the rhopalocera (lepidoptera) of Mount Arayat, Pampanga, Philippines	0013
Coconut yield and profitability under two practical fertilizer options: common salt (sodium chloride) and multi-nutrient 14N-5P2O5-20K2O- 15CI-4.5S-0.02B applications on bearing trees (technology notes)	0014
Cocoon yield and quality of silkworm fed with leaves harvested from mulberry grown under conventional, LEISA, and organic agro-ecosystem manipulations	0015
Co-inoculation of mungbean with rhizobia and plant growth promoting rhizobacteria (PGPR) improves nodulation, dry matter yield and nitrogen uptake	0016
Comparative analysis of coffee farming practices introduced by government and the private sectors in Paksong District, Champasak Province, Lao PDR	0017
Contribution to the taxonomy of Philippine megapodagrionidae (odonata:zygoptera)	0018
Control of the tobacco beetle, <i>Lasioderma serricorne</i> (Fabricius) (Coleoptera: Anobiidae), with carbon dioxide under high pressure	0019
Corn in the Philippines: feeding the population beyond the present	0020
Creating a master plan for coconut sap sugar	0021
Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)	0022
Cuticle-degrading enzyme activity of <i>Metarhizium anisopliae</i> (METSCH.) Sorok. isolates pathogenic to asian corn borer larvae	0023
Damage assessment of lepidopterous pests of onion in Nueva Ecija	0024
First description of the male of <i>Heteropoda cyperusiria</i> barrion & litsinger 1995 from the Philippines (Araneae: Sparassidae: Heteropodinae)	0025
A descriptive model of cropping decision making application to crop diversification in irrigated rice farms	0026
Design and development of non-refrigerated storage system for selected fruits and vegetables	0027
Determination of weight percentage moldy corn kernels from bulk samples using flatbed scanner	0028
Development and incidence of <i>Neozygites fresenii</i> (Nowakowski) remaudiere & Keller (Zygomycetes: Entomophthorales) in aphis craccivora koch and its pathogenicity to three other aphididae (Hemiptera)	0029

Development of a computer vision system for milled rice quality analysis	0030
Development of high yielding and bunchy top virus resistant abaca ( <i>Musa textilis</i> Nee) cultivars	0031
Development of improved varieties of mungbean (NSIC Mg14 and NSIC mg15)	0032
Development of Philmech rice hull-fed furnace system for heating mechanical dryers	0033
Diagnosis and control of porcine epidemic diarrhea: case report	0034
Drying of mestizo 1 and mestizo 3 hybrid rice seeds	0035
Dwarf banana now tissue-cultured	0036
Easy methods of propagating citrus	0037
An easy way to germinate sago palm seeds found	0038
The economic impact of FMD and its control in the Philippines	0039
Effect of pretreatment on the structure and catalytic properties of rice hull-derived zeolites	0040
Effects of age and needle length on the seroconversion and herd immunity of a commercial trivalent ( $O_1$ , $A_{24}$ , $C_3$ ) oil-based FMD vaccine	0041
Effects of fertilizer on shoot emergence of four bamboo species	0042
Effects of zinc and boron fertilization on the alleviation of poor crop growth in heavily limed two acidic soils	0043
Emerging swine production technologies to keep pace with increasing population	0044
Exclusion of <i>Planococcus lilacinus</i> (cockerell) from the list of Philippine bamboo pests based on field and laboratory studies	0045
Exploring the use of theater as an intervention tool for FMD control	0046
Some factors affecting mass rearing of the <i>Vanda</i> thrips, <i>Dichromothrips corbetti</i> (priesner) (thysanoptera: thripidae)	0047
Farm application of radoimmunoassay technology in dairy cattle management	0048
The fate of pesticides in rice paddy ecosystem using nuclear techniques	0049
The fecundity and fertility of field collected and corn stalk collected asian corn borer, <i>Ostrinia furnacalis</i> Guenee	0050
Fertilizer management of arabica coffee during rejuvenation	0051
FMD information management system as a disease surveillance tool in FMD control and eradication program in the Philippines	0052
Genetic diversity analysis of Philippine maize inbred lines using microsatellite markers	0053
Geographical distribution and frequency of albumin, transferrin, and $\alpha$ -2 microglobulin alleles among anglo nubian, native goats and their F <sub>1</sub> crosses	0054
Growth performance and yield of selected strain (gift) nile tilapia ( <i>Oreochromis niloticus</i> L.) in lowland irrigated ricefields integrated with azolla and mallard duck	0055
Heat pump drying of onion (Allium cepa)	0056

Hull-imposed dormancy in rice	0057
Improving quality and shelf-life of vegetables and fruits by evaporative cooling storage	0058
Improving the production of corn and rice with controlled availability fertilizer (CAF) in Pinatubo Lahar	0059
In situ compositing of rice straw using embased inoculant and chicken manure	0060
High incidence of land snails mortality at Mt. Arayat, Pampanga: an evidence of global warming	0061
The influence of body weight and diet on the ammonia excretion of the African catfish <i>Clarias geriepinus</i>	0062
Influence of boron-potassium fertilizer application on the occurrence of cracking in carrots ( <i>Daucus carrota</i> Linn)	0063
The international and local scene in food irradiation and its relevance to future directions for food irradiation in the Philippines	0064
Invasion of the buff coconut mealybug ( <i>Nipaecoccus nipae</i> ) in U.P. Los Baños campus, elucidation of the confounded "mealybug burn" damage and practical control	0065
Kinetics of iron in the development of rapid screening technique for iron toxicity tolerance in rice	0066
<i>Limnocharis flava</i> L. BUCH., and <i>Salvinia molesta</i> MITCHELL: potential threats to aquatic ecosystem in Luzon	0067
Management of banana Fusarium disease	0068
Mapping of the <i>Rf</i> gene of a cytoplasmic male sterile line of rice ( <i>Oryza sativa</i> L.) developed from a mutagenized source	0069
Mapping quantitative trait loci associated with resistance to preharvest sprouting in wheat	0070
Microbial biomass as indicator of organic fertilizer mineralization in paddy soil	0071
MMSU produces 2 million Jatropha seedlings for PNOC-AFC	0072
Molecular and phenotypic studies of resistance genes introgressed from wild tomato ( <i>Lycopersicon chilense</i> ) to cultivated tomato ( <i>Lycopersicon esculentum</i> ) against tomato leaf curl virus isolate from the Philippines	0073
Multiplex polymerase chain reaction for simultaneous detection of major mastitis- causing pathogens in buffalo milk	0074
Muyong: an indigenous sustainable forest management system	0075
Two <i>Neozygites</i> species (Zygomycetes: Entomophthorales) infecting aphids and mealybugs on Leyte Island	0076
A new genus and species of aphalaridae (psylloidea, hemiptera) from Mount Makiling, Luzon Island, Philippines	0077
A new species of dried banana leaf spider, <i>Neobrettus</i> wanless 1984 (Araneae: Salticidae) from the agricultural lowlands of Mt. Banahaw, Quezon Province, Philippines	0078

A new species of stick insect (Phasmatodea: Heteropterygidae: Obriminae: Obrimini) from Cebu Island, Philippines	0079
A new species of the genus <i>Bavia</i> simon, 1877 (Araneae: Salticidae) from the highlands of Sagada, Mountain Province, Luzon Island, Philippines	0080
Is nipa farming feasible	0081
Optimization of batch recirculating dryer performance	0082
Organic matter residue management for the improvement of soil quality in lowland rice systems	0083
Organic rice farming in Northeastern Thailand: an assessment of farmers' practices	0084
The <i>Paurocephala psylloptera</i> -complex (Hemiptera: Psylloidea: Aphalaridae) in the Philippines with description of a new species	0085
Pestnet: an inexpensive diagnostics and pest management advisory tool for crop protection practitioners in the Philippines	0086
<i>Phacopteron gabrieli</i> , a new psylloid (Hemiptera: Psylloidea: Phacopteronidae) from Mount Makiling, Luzon Island, Philippines	0087
<i>Phasmotaenia elongata</i> , n. sp., a new stick insect (Phasmatodea: Phasmatidae) from the Philippine Islands	0088
The Philippine duck industry: issues and policy directions	0089
Some Philippine raphignathoidea (acari). IV. the genera <i>Ledermuelleriopsis</i> willmannn and <i>Zetzellia</i> oudemans (stigmaeidae)	0090
PNRI mutant variety: Cordyline 'Afable'	0091
Potential effects of commercial molluscicides used in controlling golden apple snails of the native snail <i>Vivipara costata</i> (Quoy & Gaimard)	0092
Predicting the effects of land use on runoff and sediment yield in selected sub- watersheds of the manupali river using the Arcswat model	0093
Productivity and soil erosion in various crop cover in the mountainous areas of Bondoc Peninsula, Philippines	0094
Profitability of Coconut production: an analysis of farm size, rental, cost, inorganic fertilization, and copra price during a five-year cropping cycle period (technology notes)	0095
Propagation of machiku bamboo through air layering	0096
Quantitative and qualitative assessment of corn postharvest losses	0097
Quantitative resistance loci (QRL) against bacterial blight ( <i>Xanthomonas oryza pv. oryzae</i> ) and leaf blast ( <i>Pyricularia orazae Sacc.</i> ) and quantitative trait loci (QTL) for grain qualities in rice ( <i>Oryza sativa L.</i> )	0098
Quantitative trait loci (QTL) analysis for iron toxicity tolerance in rice (Oryza sativa L.)	0099
Region I adopts sweet sorghum as regional strategic commodity	0100
Research and development of the spiral pump for water-disadvantaged areas in the Philippines: part I. statistically aided design of prototypes at Los Banos	0101

	Research and development of the spiral pump for water-disadvantaged areas in the Philippines: part II. field tests under actual farm conditions in Abra	0102
	Researchers find ways to improve productivity of kawayan tinik	0103
	A review and revised checklist of the mites (acari) in B.P. Gabriel's "insects and mites injurious to Philippine crop plants"	0104
	A review of the genus ultratenuipalpus mitrofanov (acari:tenuipalpidae) with descriptions of two new species from the Philippines	0105
	The rice problem in the Philippines: trends, constraints, and policy imperatives	0106
	Rubber disease enters Republic of the Philippines; found in Mindanao	0107
	Save much on seeding with the improved drum seeder	0108
	Seed quality response to fungicide treatment of a line and F <sub>1</sub> hybrid seeds	0109
	Seven new endemic species of Hoya R. Br. (Apocynaceae) from the Philippines	0110
	State university developes dragon fruit products	0111
	Status, prospects, and strategic options of buntal fiber industry in Marinduque	0112
	Survey, identification and life history of Anthurium thrips	0113
	Survey of alternate host plants of the Asian corn borer <i>Ostrinia furnacalis</i> (Guenee): maramais Trypsacum laxum, in Pangasinan	0114
	A survey of the rhopalocera (lepidoptera) of Mt. Makiling, Laguna, Philippines	0115
	Survival of boar spermatozoa intended for <i>In vitro</i> fertilization (IVF) following different speed, duration and frequency of sperm washing	0116
	Sweet sorghum jaggery as alternative media for the production of commercial yeast	0117
	A taxonomic list of butterflies (lepidoptera:papilionoidea and hesperioidea) from Mount Banahao de Lucban, Quezon Province, Philippines	0118
	Technologies for profitable tobacco production	0119
	Technology transfer of <i>Cotesia</i> -based IPM for diamondback moth on lowland elevation crucifers in Luzon	0120
	Tissue cultured avocado ( <i>Persea americana</i> MILLER): a journey from laboratory to field	0121
	Transgenic rice plants overexpressing host transcription factors Rf2A and Rf2B are tolerant to tungro disease	0122
	Utilization of acacia mangium for cement-bonded board manufacture	0123
	The utilization of azolla in the Philippines: biological problems and solutions	0124
	Utilizing balete for riverbank protection and watershed rehabilitation	0125
	Water management for improved post-rice production of upland crops in irrigated paddies	0126
	Wild genetic useful mushroom resources of Central Luzon, as sources of nutriceuticals	0127
	High yielding sweet potato variety for Mindanao	0128
Ag	groforestry	

Fertilizer management of arabica coffee during rejuvenation	0051
Air layering	
Propagation of machiku bamboo through air layering	0096
Air pollution	
Effect of the diurnal variation of the convective boundary layer height over Metro Manila on pollutant concentration	0315
A model simulation of air pollution over Metro Manila	0319
Air tube type heat exchanger	
Development of Philmech rice hull-fed furnace system for heating mechanical dryers	0033
Albendazole	
A family health care model for the implementation of mass annual treatment with diethylcarbamazine citrate for the elimination of filariasis in the Philippines	0468
Albumin	
Geographical distribution and frequency of albumin, transferrin, and $\alpha$ -2 microglobulin alleles among anglo nubian, native goats and their F <sub>1</sub> crosses	0054
Alcohol screening aid	
Cross-sectional study of the alcohol use among elderly patients seen in the Veterans Memorial Medical Center Medical Out-Patient Clinic using alcohol screening aid of the National Institute on Alcohol Abuse and Alcoholism	0452
Algorithm	
Dipolar interaction in a one-dimensional ising ring	0522
Alkaline protease	
Comparison of conventional plate assays with DNA-based screening protocols for protease and cellulase production from putative <i>Bacillus</i> isolates	0151
Alkaline solution	
Anisotropic surface tecturing of silicon substrate using alkaline solution for solar cell application	0516
Alkaloid	
Alkaloid studies on selected Philippine plants: a summary report	0513
Alkylating chemical mutagen	
Mutation frequency in mungo ( <i>Phaseolus radiatus</i> L.) after treatment with an alkylating chemical mutagen	0238
Allele frequency	
Genetic polymorphism of CYP2D6*10 gene among Filipinos	0470
Allelomimesis clustering	
Experimental verification of the allelomimesis clustering model	0531
Allergy	

CpG oligodeoxynucleotides as immunomodulators of rBlo t 5-induced allergic	0153
Interleukin 4 -590 C/T gene polymorphism as a genetic marker for atopic asthma ir a selected Filipino pediatric population	0479
Alleviate	
Effects of arbuscular mycorrhizal fungi inoculation on growth and Cu uptake and toxicity of <i>Desmodium cinereum</i> (Kunth) D.C.	0162
Allografts	
Irradiated long bone transplants in limb saving surgeries for extremity bone cancers	0481
Alnus maritima	
Field growth responses of three tree species to mycorrhiza and fertilizers in the bioremediation of a mine waste dump	0351
Alpha 2-microglobulin	
Geographical distribution and frequency of albumin, transferrin, and $\alpha$ -2 microglobulin alleles among anglo nubian, native goats and their F <sub>1</sub> crosses	0054
Alpha cristobalite	
Characteristics of Pangasinan zeolite as a molecular sieve for bioethanol	0284
Alpha keto-acid	
Development of biochemical procedures for the diagnosis of genetic disorders	0155
Alpha quartz	
Characteristics of Pangasinan zeolite as a molecular sieve for bioethanol	0284
Alternate host plant	
Survey of alternate host plants of the Asian corn borer <i>Ostrinia furnacalis</i> (Guenee): maramais Trypsacum laxum, in Pangasinan	0114
Alternative medicine	
Complementary alternative medicine usage among diabetic patients of Ospital ng Maynila Medical Center from January 2004 - June 2005	0450
Alternative pump technology	
Reducing fossil fuel emission using treadle pump technology	0303
Aluminum	
Time-of-flight measurement of a 355-nm Nd:YAG laser-produced aluminum plasma	0583
Aluminum sulfate	
Utilization of acacia mangium for cement-bonded board manufacture	0123
Amino acid	
Development of biochemical procedures for the diagnosis of genetic disorders	0155
Aminohexyloxy	
Side-chain polymer as matrix in cholesteric liquid crystals/polymer composites	0271

Ammonia excretion	
The influence of body weight and diet on the ammonia excretion of the African catfish <i>Clarias geriepinus</i>	0062
Ammonium persulfate	
Method validation for the determination of iodine in urine by ammonium persulfate digestion with spectrophotometric detection of the Sandell-Kolthoff reaction	0344
Amnesic Shellfish Poisoning (ASP)	
Species account of marine diatoms of the genus <i>Pseudo-nitzschia</i> in San Pedro Bay, Philippines	0321
Anacardium occidentale	
Induction of somatic embryo from cotyledonary tissues of cashew (Anacardium occidentale L.) by in vitro culture	0185
Analgesia	
Application of non-conventional acupuncture in sheep, cattle and water buffaloes	0605
Analgesics	
Practice patterns of physicians in the management of patients admitted for acute sinusitis in Chong Hua Hospital, January 2003 - June 2006	0498
Anda Island	
Four new records and one new species of Philippine myxomycetes from Hundred Islands and Anda Island, Pangasinan	0173
Anderson-Kim Thennally-Activated Flux Creep Theory	
Thermally-activated vortex motion and electrical dissipation in a $Bi_2Sr_2CaCu_2O_{\hat{l}'}$ thin film	0579
Anemia	
Nutrition problems of the urban family	0492
Anglo nubian	
Geographical distribution and frequency of albumin, transferrin, and $\alpha$ -2 microglobulin alleles among anglo nubian, native goats and their F <sub>1</sub> crosses	0054
Angular resolution	
Angular and lateral resolution study in pCT imaging involving biological tissues	0515
Animal feeds	
Simple and rapid screening of antimicrobials in feed samples	0225
Animal health care	
Emerging swine production technologies to keep pace with increasing population	0044
Anisotropic surface texturing	
Anisotropic surface tecturing of silicon substrate using alkaline solution for solar cell application	0516
Annealing	

Surface modified zinc oxide: a potential smoke sensor at ambient condition	0572
Tempering and annealing in a verdier-stockmayer polymer	0576
Anodic alumina oxide	
Fabrication of anodic alumina oxide templates and their use for the electrosynthesis of polythiophene nanowires	0254
ANOVA	
Effects of age and needle length on the seroconversion and herd immunity of a commercial trivalent ( $O_1$ , $A_{24}$ , $C_3$ ) oil-based FMD vaccine	0041
Antagonistic plantas	
Alternative management strategies against the rice root-knot nematode, <i>Meioidogyne graminicoia</i> in rice-onion system	0003
Anthurium thrips	
Survey, identification and life history of Anthurium thrips	0113
Anti-allatal effects	
Antigonadotropic effects of precocene II: allaticidal action in females of Nilaparvata lugens (Stal)	0608
Anti-Helmholtz coiIs	
Measurement of the temperature of rubidium atoms in a magneto-optical trap	0546
Anti-obesity	
Probiotic property of locally-isolated lactic acid bacteria and development of soya based probiotic product	0219
Anti-rabies vaccine	
Comparative study on the use of fourth finger technique versus standard technique of intradermal injection of anti-rabies vaccine	0449
Antibacterial	
Lemon grass (Cymbopogon citratus)extract: a promising antibacterial juice	0189
Antibiotic resistance	
Simple and rapid screening of antimicrobials in feed samples	0225
Antibiotic susceptibility profiles	
Management of <i>Vibrio</i> infections in fishery industry by antibiotic susceptibility profiling	0192
Antihistamine	
Chronic idiopathic urticaria (CIU), unveiled	0438
Practice patterns of physicians in the management of patients admitted for acute sinusitis in Chong Hua Hospital, January 2003 - June 2006	0498
Antimicrobial	
Antimicrobial activity of <i>Chromolaena odorata</i> (L. f.) King & Robinson and <i>Uncaria perrottetii</i> (A. Rich) Merr. <i>extracts</i>	0131

Antimicrobial and cytotoxic terpenoids from Cymbopogon citratus Stapf.	0242
Antimicrobial activity	
Antimicrobial activity of the crude ethanol extract of the seeds of <i>Ipomoea muricata</i> (Jacq.) convolvulaceae against selected clinical isolates	0241
Antimicrobial properties of some marine sponge (porifera) from Mactan, Cebu, Philippines	0132
Antimicrobial agent	
Rapid synthesis under mild conditions of an acrylic diamide N, N, N', N'T etrabutylphthalamide, a potential antimicrobial agent	0599
Antimicrobial index	
Rapid synthesis under mild conditions of an acrylic diamide N, N, N', N'T etrabutylphthalamide, a potential antimicrobial agent	0599
Antimicrobials	
Optimization of fermentation medium for the production of bioactive compound by <i>Streptomyces sp.</i>	0207
Simple and rapid screening of antimicrobials in feed samples	0225
Antioxidant	
Effects of antioxidant extracted from leaves of "banaba" ( <i>Lagerstroemia speciosa</i> , <i>L</i> .), mangosteen ( <i>Garcinia mangostana</i> , <i>L</i> .) and "tsaang gubat" ( <i>Ehretia microphylla L</i> .) on the oxidation stability of biodiesel	0290
Spectrophotometric analysis of $\alpha$ -tocopherol using emeraldine film	0272
Antioxidants	
Fortification of sugar with vitamin A-technology generation and transfer	0258
Antiseptic	
The antiseptic activity of Psidium guajava essential oil	0133
Ants	
A new genus, two new species and a new subspecies of Philippine Ants (Hymenoptera: Formicidae)	0203
Anuran species	
Distribution of anuran species in Loboc Watershed of Bohol Island, Philippines	0157
Aphalaridae	
A new genus and species of aphalaridae (psylloidea, hemiptera) from Mount Makiling, Luzon Island, Philippines	0077
The <i>Paurocephala psylloptera</i> -complex (Hemiptera: Psylloidea: Aphalaridae) in the Philippines with description of a new species	0085
Aphids	
Development and incidence of <i>Neozygites fresenii</i> (Nowakowski) remaudiere & Keller (Zygomycetes: Entomophthorales) in aphis craccivora koch and its pathogenicity to three other aphididae (Hemiptera)	0029

Two <i>Neozygites</i> species (Zygomycetes: Entomophthorales) infecting aphids and mealybugs on Leyte Island	0076
Aphis craccivora	
Development and incidence of <i>Neozygites fresenii</i> (Nowakowski) remaudiere & Keller (Zygomycetes: Entomophthorales) in aphis craccivora koch and its pathogenicity to three other aphididae (Hemiptera)	0029
Aphytis	
Biological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)	0142
Aphytis sp. nr. chrysomphali	
Biological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)	0142
Apogon thermalis	
Parasitic crustaceans in fishes from some Philippine lakes	0390
Appropriateness of care	
Effectiveness of group consensus activity in improving appropriateness of care for the management of adult asthmatic patients in the ambulatory care unit	0464
Aquaculture	
Ecosystem-based approach to aquaculture management	0382
Towards sustainable aquaculture in the Philippines	0340
Water quality analysis and utilization of small farm reservoirs (SFRs) for aquaculture in Region III	0277
Zooplankton spatial abundance and distribution in the West Bay of Laguna de Bay (Philippines) with notes on potential implications to food and health security	0237
Aquapuncture	
Application of non-conventional acupuncture in sheep, cattle and water buffaloes	0605
Aquaria	
Salinity tolerance of freshwater catfish ( <i>Clarias batrachus</i> Linnaeus and <i>Clarias macrocephalus</i> Gunther) in aquaria in the laboratory of CSCST-Fishery and Industrial College, San Francisco, Cebu	0333
Arabica coffee	
Fertilizer management of arabica coffee during rejuvenation	0051
Arbuscular mycorrhizal fungi	
Effects of arbuscular mycorrhizal fungi inoculation on growth and Cu uptake and toxicity of <i>Desmodium cinereum</i> (Kunth) D.C.	0162
Architecture	
Learning capability of a silnple neural network	0543
Arcyria sp.	
Occurrence of corticolous myxomycetes from acacia trees (Samanea samans Merr) collected from different sites in Luzon Island, Philippines	0205
Argiolestes baltazarae	

Contribution to the taxonomy of Philippine megapodagrionidae (odonata:zygoptera)	0018
Argiolestes realensis	
Contribution to the taxonomy of Philippine megapodagrionidae (odonata:zygoptera)	0018
Argulus indicus	
Parasitic crustaceans in fishes from some Philippine lakes	0390
Arsenate	
Investigation of arsenate uptake by hydrotalcite at hyperalkaline and elevated temperature conditions	0296
Arsenic	
Arsenic and mercury concentrations of the waters and janitor fishes (Pterygoplichthys spp.) in the Marikina River, Philippines	0134
Effect of functional iron oxide nanocrystals on the arsenic level in drinking water	0247
Artemisia vulgaris L. (damong maria)	
The comparative effects of purified fractions of <i>Vitex negundo L</i> . (lagundi) and crude extracts of <i>Cassia alata L</i> . (akapulko) and <i>Artemisia vulgaris L</i> . (damong maria) on inflammatory processes. <i>In vitro</i>	0447
Arthropod-associated mites	
A checklist and host index of Philippine mites (acari) associated with arthropods	0609
Artificial gaps	
Effects of forest gaps on foliage insect diversity in the perment field laboratory areas (PFLAS)in Mt. Makiling Forest Reserve	0350
Artificial insemination	
Emerging swine production technologies to keep pace with increasing population	0044
Artificial neural network (ANN)	
Development of a computer vision system for milled rice quality analysis	0030
Artificial neural network {ANN} softwares.	
Determination of weight percentage moldy corn kernels from bulk samples using flatbed scanner	0028
AR_DOSE	
AR_DOSE: a PC program for stack design and the PRR-1 41Ar effluent	0357
Ashfall	
Adaptability and management of vegetables legumes and cereals in ashfall and lahar areas	0002
Ashtamudi estuary	
Padal fishing: a unique fishing method in the Ashtamudi estuary of Kerala (South India)	0332
Asian corn borer	
The fecundity and fertility of field collected and corn stalk collected asian corn	0050

borer, Ostrinia furnacalis Guenee	
Survey of alternate host plants of the Asian corn borer Ostrinia furnacalis (Guenee): maramais Trypsacum laxum, in Pangasinan	0114
Aspergillus sp.	
Banana root endophytes: potential biocontrol agents for vascular wilt disease	0139
Assessment	
Diversity and status of plants in three mountain ecosystems in Southern Mindanao, Philippines	0314
Asthma	
Interleukin 4 -590 C/T gene polymorphism as a genetic marker for atopic asthma in a selected Filipino pediatric population	0479
Atmosphere	
DBA_DOSE: a PC program for stack design and the PRR-1 design basis accident	0360
Atmospheric plasma	
Initial studies of a microwave-induced atmospheric plasma jet	0540
Atomic absorption	
Nutrition problems of the urban family	0492
Atomic cloud	
Measurement of the temperature of rubidium atoms in a magneto-optical trap	0546
Atoms	
Measurement of the temperature of rubidium atoms in a magneto-optical trap	0546
Atopic	
Interleukin 4 -590 C/T gene polymorphism as a genetic marker for atopic asthma in a selected Filipino pediatric population	0479
Atrial fibrillation (AF)	
The rifasaf project: a case-control study on risk factors for stroke among Filipinos	0505
Au(111) single crystal electrode	
Nanowire formation and polymer conformations of electropolymerized poly(3,4,- ethylenedioxythiophene) (PEDOT) on iodine-modified Au(111) single crystal electrode as probed by <i>in-situ</i> STM	0298
Auricularia polytricha	
Wild genetic useful mushroom resources of Central Luzon, as sources of nutriceuticals	0127
Autocompaction	
Compaction rates and paleo-sea levels along the delta complex north of Manila Bay, Luzon Island, Philippines	0359
Automatic feeding of rice hull	
Development of Philmech rice hull-fed furnace system for heating mechanical	0033

dryers

Automorphisms	
Symmetric designs from a rahilly family of pre-difference sets of orders 2 and 3	0423
Autophagy	
Enhanced autophagic cell death in expanded polyhistidine variants of HOXA1 reduces PBX1 coupled transcriptional activity and inhibits neuronal differentiation	0166
Averrhoa carambola	
Balimbing: a fruit with myriad uses	0009
Avicennia	
Improving the environment and living conditions of the rural poor: potential of reforestation CDM in the mangrove communities of San Juan Batangas	0352
Avifauna	
The avifauna of Mt. Haponhaponon, Mantikil, Siaton, Negros Oriental: with notes on other vertebrates	0312
Avocado	
Tissue cultured avocado ( <i>Persea americana</i> MILLER): a journey from laboratory to field	0121
Avrami approach	
Kinetics of non-isothermal crystallization of coconut-based cholesteryl ester: avrami and ozawa approaches	0542
Azmil mutant	
Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)	0022
Azolla	
Growth performance and yield of selected strain (gift) nile tilapia ( <i>Oreochromis niloticus</i> L.) in lowland irrigated ricefields integrated with azolla and mallard duck	0055
The utilization of azolla in the Philippines: biological problems and solutions	0124
B. vulgaris	
Effects of fertilizer on shoot emergence of four bamboo species	0042
Bacillariophyceae	
A checklist of Navicula (Class Bacillariophyceae) of the Philippines	0149
Bacillus	
Comparison of conventional plate assays with DNA-based screening protocols for protease and cellulase production from putative <i>Bacillus</i> isolates	0151
Bacteria	
Microbial fuel cell: a new renewable source of energy: Pasig river sediments for lighting	0297
Bacterial blight	

Quantitative resistance loci (QRL) against bacterial blight ( <i>Xanthomonas oryza pv. oryzae</i> ) and leaf blast ( <i>Pyricularia orazae Sacc.</i> ) and quantitative trait loci (QTL) for grain qualities in rice ( <i>Oryza sativa L.</i> )	0098
Bacterial diversity	
Identification of bacteria isolated from standing and dripping water of Bulalon Cave, Burdeos, Polillo Islands, Quezon Province	0182
Bacteriastrum	
Abundance, composition and distribution of Phytoplankton in Calamianes, Palawan	0129
Bacteriophage	
Comparative treament of <i>Pseudomonas aeruginosa</i> burn wound infection using bacteriophage MB08 and antibiotics	0150
Bagras (Eucalyptus deglupta Blume)	
Strength and related properties of bagras ( <i>Eucalyptus deglupta</i> Blume) and gubas ( <i>Endospermum peltatum</i> Merr.) in comparison with some tree plantation species in the Philippines	0355
Balete tree	
Utilizing balete for riverbank protection and watershed rehabilitation	0125
Balimbing	
Balimbing: a fruit with myriad uses	0009
Bamboo	
Effects of fertilizer on shoot emergence of four bamboo species	0042
Propagation of machiku bamboo through air layering	0096
Researchers find ways to improve productivity of kawayan tinik	0103
Bamboo mealybugs	
Exclusion of <i>Planococcus lilacinus</i> (cockerell) from the list of Philippine bamboo pests based on field and laboratory studies	0045
Bamboo pests	
Exclusion of <i>Planococcus lilacinus</i> (cockerell) from the list of Philippine bamboo pests based on field and laboratory studies	0045
Bambusa blumeana	
Effects of fertilizer on shoot emergence of four bamboo species	0042
Researchers find ways to improve productivity of kawayan tinik	0103
Bambusa. sp.	
Effects of fertilizer on shoot emergence of four bamboo species	0042
Banaba	
Effects of antioxidant extracted from leaves of "banaba" ( <i>Lagerstroemia speciosa</i> , <i>L</i> .), mangosteen ( <i>Garcinia mangostana</i> , <i>L</i> .) and "tsaang gubat" ( <i>Ehretia microphylla L</i> .) on the oxidation stability of biodiesel	0290
Banach	

The daugavet equation for a sequence of operators	0411
Banak	
Save Ludong, the most delicious and expensive fish in Republic of the Philippines	0334
Banana	
Development of Philippine tropical fabrics from indigenous sources	0588
Dwarf banana now tissue-cultured	0036
The effect of banana fruit ( <i>Musa sapientum</i> ) as adjunct to ranitidine in the management of uninvestigated dyspepsia	0460
Management of banana Fusarium disease	0068
Bangus	
Assessment on the estuarine areas of Camotes Islands, Central Philippines: their ecology and prospects for milkfish (Chanos chanos) and prawn (Penaeus monodon) industry	0327
Basic design parameters	
Basic design parameters for the new PRR-1 stack	0358
Basic health services	
Basic health services and population growth	0436
Basic social services	
The economic impact of the demographic crisis: its implications on public policy	0601
Batch recirculating dryer	
Optimization of batch recirculating dryer performance	0082
Bathymetry	
Bathymetry and hydrobiology of Lake Mahagnao, Leyte	0380
Bats	
Wing ecomorphology and flight performance of bats in Pisan Cave, Kabacan, North Cotabato, Philippines	0235
Bavia gabrieli n. sp.	
A new species of the genus <i>Bavia</i> simon, 1877 (Araneae: Salticidae) from the highlands of Sagada, Mountain Province, Luzon Island, Philippines	0080
BC1- first backcross progeny	
Development of high yielding and bunchy top virus resistant abaca ( <i>Musa textilis</i> Nee) cultivars	0031
Behavior	
A new species of dried banana leaf spider, <i>Neobrettus</i> wanless 1984 (Araneae: Salticidae) from the agricultural lowlands of Mt. Banahaw, Quezon Province, Philippines	0078
Static behaviors of confined time-arrival operators	0569
Behavioral phenomenon	

Philippine social science in the century of biology engaging the biological dimensions of behavioral and social phenomena	0210
Belief	
A study on the common superstitious health beliefs and practices among randomly selected pregnant women in Punta Engaño, Mactan, Cebu	0511
Bending	
Fertilizer management of arabica coffee during rejuvenation	0051
Bending mode	
Elastic properties of a biopolymer	0165
Bending rigidity	
Elastic properties of a biopolymer	0165
Bengawan mutant	
Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)	0022
Benomyl	
Seed quality response to fungicide treatment of a line and F <sub>1</sub> hybrid seeds	0109
Benthos	
Low-level color and texture feature extraction of coral reef components	0545
A survey of macro-invertebrate gleaning in the Banate Bay Intertidal Area, Eastern Panay Island	0400
Benzimidazoles	
Microwave-assisted reaction: a cleaner and efficient method for the synthesis of indazoles and benzimidazoles	0596
Beowulf cluster	
Development of a Beowulf-Class High Performance Computing System for Computational Science Applications	0604
Bg1C	
Site-directed mutagenesis identifies putative soil-binding residues of <i>Bacillus</i> subtilis 168 endoglucanase	0226
bglC	
Bacillus subtilis 168 endoglucanase binds to chemical soils under diverse conditions	0138
Bi-level optimization	
A bi-level multi-period optimization model for multiple feedstock bioenergy supply chains	0283
BIM	
Effect of mykovam, beneficial indigenous microbes and compost for improved growth of <i>Terminalia catappa</i> in an acidic infertile soil	0161
Binary cyclic codes	

Cubic construction over binary cyclic codes	0410
Bio-organic fertilizer	
Butterfly manure: a novel source of bio-organic fertilizer	0011
Bio-stimulator patch	
Electroconductive polythiophene/polyester composite as <i>e</i> -cloth	0249
Bioassay	
Antimicrobial properties of some marine sponge (porifera) from Mactan, Cebu, Philippines	0132
Glycemic effect of betel nut (Areca catechu Linn.) fruit	0371
Bioassay method	
Pharmacologic and toxicologic studies on lagundi (Vitex negundo, L.)	0495
Bioautography	
Fruticose lichens from selected sites in Luzon as sources of biologically active lichen acids	0176
Preliminary screening of methanolic extracts of kalingag ( <i>Cinnamomum mercadoi</i> Vindal) and Talisay ( <i>Terminalia catappa</i> ) against methicillin resistant Staphylococcus aureus (MRSA)	0217
Bioburden level	
Factors contributing to the bioburden level of polyvinylpyrrolidone-kappa carrageenan hudrogel	0257
Biocontrol	
Banana root endophytes: potential biocontrol agents for vascular wilt disease	0139
Biodegradation	
Biodegradation of banana stalks and sweet sorghum bagasse under solid state culture of <i>Pleurotus sajor caju</i>	0140
Biodiesel	
ASU to produce biodiesel from waste fats	0008
Effects of antioxidant extracted from leaves of "banaba" ( <i>Lagerstroemia speciosa</i> , <i>L</i> .), mangosteen ( <i>Garcinia mangostana</i> , <i>L</i> .) and "tsaang gubat" ( <i>Ehretia microphylla L</i> .) on the oxidation stability of biodiesel	0290
Biodiversity	
Analysis of genetic diversity in coconut by RAPD	0004
Four new records and one new species of Philippine myxomycetes from Hundred Islands and Anda Island, Pangasinan	0173
Occurrence of corticolous myxomycetes from acacia trees (Samanea samans Merr) collected from different sites in Luzon Island, Philippines	0205
Philippine biodiversity: ecological roles, uses, and conservation status	0279
Bioeconomics	
Bioeconomics of native pig production in Marinduque	0010

Bioenergy system	
A bi-level multi-period optimization model for multiple feedstock bioenergy supply chains	0283
Bioethanol	
Characteristics of Pangasinan zeolite as a molecular sieve for bioethanol	0284
Biofertilizers	
Effect of mykovam, beneficial indigenous microbes and compost for improved growth of <i>Terminalia catappa</i> in an acidic infertile soil	0161
Biofuel	
Preliminary investigation of <i>Calophyllum inophyllum</i> (Bitaog) as a potential source of biofuel	0301
Properties and performance of MMSU hydrous biofuel	0598
Biofuel feedstock	
Yield potential of rain tree fruit (Samanea saman Merr.) as feedstock for biofuel production	0600
Biofuel production	
Yield potential of rain tree fruit (Samanea saman Merr.) as feedstock for biofuel production	0600
Biofuels	
Region I adopts sweet sorghum as regional strategic commodity	0100
Biogenic H2S	
Laboratory scale bioremediation of copper containing wastewater from gold smelting using biogenic hydrogen sulfide	0187
Bioindicator	
Bioluminescent bacteria as bioindicator of marine environmental stress in Iligan City	0144
Comparison of pollen abortiveness in four weed species treated with mercuric chloride	0152
Biological assay	
The effect of dietary oil on the growth and intellectual capacity of mice	0245
Biological factor	
Development of a simple biological model of vertical phytoplankton distribution	0381
Biological parameters	
SEAFDEC contribution to the ecological awareness of Philippine Lakes	0397
Biological properties of materials	
Radiation processing: a versatile technology for industry	0378
Biology	
Abundance, composition and distribution of Phytoplankton in Calamianes, Palawan	0129

Agricultural biotechnology trends and challenges	0130
Antimicrobial activity of <i>Chromolaena odorata</i> (L. f.) King & Robinson and <i>Uncaria perrottetii</i> (A. Rich) Merr. <i>extracts</i>	0131
Antimicrobial properties of some marine sponge (porifera) from Mactan, Cebu, Philippines	0132
The antiseptic activity of Psidium guajava essential oil	0133
Arsenic and mercury concentrations of the waters and janitor fishes (Pterygoplichthys spp.) in the Marikina River, Philippines	0134
Some aspects of the population biology of the green tiger prawn <i>Penaeus</i> semisulcatus (De Haan, 1844) from Pilar and Capiz Bays, Northern Panay, West Central Philippines	0135
Assessment of fish fauna in Lake Lanao	0136
Assessment of genetic diversity in <i>Tectona philippinensis</i> Benth. & Hook. f. (Verbenaceae) inferred from <i>TRNL</i> intron sequences	0137
Bacillus subtilis 168 endoglucanase binds to chemical soils under diverse conditions	0138
Banana root endophytes: potential biocontrol agents for vascular wilt disease	0139
Biodegradation of banana stalks and sweet sorghum bagasse under solid state culture of <i>Pleurotus sajor caju</i>	0140
Biodiversity and status of butterflies in the vicinity of Mountain View College, Mt. Nebo, Valencia City	0141
Biological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)	0142
Biology of the orchid weevil, Orchidophilus aterrimus (waterhouse)	0143
Bioluminescent bacteria as bioindicator of marine environmental stress in Iligan City	0144
Bioremediation: a proven and cost effective tool for repairing the environment	0145
Bioresource management and our common future	0146
Cellular and karyological variations in populations of green leafhopper <i>Nephotettix virescens</i> (distant) in the Philippines	0147
Characterization of a ΰ-Carrageenase-producing marine bacterium, Isolate ALAB-001	0148
A checklist of Navicula (Class Bacillariophyceae) of the Philippines	0149
Comparative treament of <i>Pseudomonas aeruginosa</i> burn wound infection using bacteriophage MB08 and antibiotics	0150
Comparison of conventional plate assays with DNA-based screening protocols for protease and cellulase production from putative <i>Bacillus</i> isolates	0151
Comparison of pollen abortiveness in four weed species treated with mercuric chloride	0152
CpG oligodeoxynucleotides as immunomodulators of rBlo t 5-induced allergic reactions	0153
Degradation of pyrene, fluorene and fluoranthene: the role of lignin peroxidase and	0154

manganese peroxidase from Ganoderma lucidum Development of biochemical procedures for the diagnosis of genetic disorders 0155 Developmental Biology of the Supermale YY Tilapia (Oreochromis niloticus): 0156 histogenesis of the reproductive system Distribution of anuran species in Loboc Watershed of Bohol Island, Philippines 0157 Diversity and status of butterflies in Maitum Village, Tandag, Surigao del Sur, 0158 Philippines DNA barcoding of birds in the University of the Philippines, Diliman Campus, with 0159 emphasis on striated grassbirds Megalurus palustris Ecology and genetic structure of giant clams around Savu Sea, East Nusa Tenggara 0160 Province, Indonesia Effect of mykovam, beneficial indigenous microbes and compost for improved 0161 growth of Terminalia catappa in an acidic infertile soil Effects of arbuscular mycorrhizal fungi inoculation on growth and Cu uptake and 0162 toxicity of Desmodium cinereum (Kunth) D.C. Effects of gamma radiation on the testicular cells of corn earworm [helicoverpa 0163 armigera (Hubner)] Effects of UV -C on the masking behavior of the green urchin Salmacis sphaeroides 0164 (Linnaeus, 1758) Elastic properties of a biopolymer 0165 Enhanced autophagic cell death in expanded polyhistidine variants of HOXA1 0166 reduces PBX1 coupled transcriptional activity and inhibits neuronal differentiation Evaluation of Philippine Gemmula: forms related to G speciosa and G kieneri 0167 Evaluation of the potency of generic anticancer drugs against various human tumor 0168 cell lines using *in-vitro* cell-based assay and parallel line assay Fermentation kinetics of gelatin-immobilized Lactobacillus plantarum BS using 0169 skim milk as substrate 0170 Floristic inventory of the Luneta Park, Manila Foliar anatomy of jade vine Strongylodon macrobotrys A. Gray (fabaceae): 0171 implications of ground and vascular tissue organization to growth and development Food and feeding habits of Synodontis nigrita from the Osun River, SW Nigeria 0172 Four new records and one new species of Philippine myxomycetes from Hundred 0173 Islands and Anda Island, Pangasinan Frequency distribution of blood groups ABO, MN and Rh factor in Philippine 0174 cosmopolitan, regional, and the national populations The fruit anatomy of Moringa oleifera Lam: a potential plant for healthy active 0175 ageing Fruticose lichens from selected sites in Luzon as sources of biologically active 0176 lichen acids Genetic diversity of Philippine Trichomonas vaginalis isolates using the 5.8S 0177 ribosomal RNA gene

Genetic variability within the population of the vulnerable Mindanao endemic Blue- Capped Kingfisher ( <i>Actenoides hombroni</i> ) using polymorphic DNA markers	0178
Geographic variation in vegetative and flower morphometry among populations of <i>Lilium philippinense</i> Baker (liliaceae), an endemic species in the Philippines	0179
The goby Trypauchenopsis intermedia Volz 1903 (Gobiidae) from the Philippines	0180
Histo-physiological development in the gestation of the male seahorse, <i>Hippocampus comes</i> Cantor 1850	0181
Identification of bacteria isolated from standing and dripping water of Bulalon Cave, Burdeos, Polillo Islands, Quezon Province	0182
Identification of ribosome-inactivating protein (RIP) in selected plants for medicinal plant properties screening	0183
<i>In vivo</i> toxicology assessment of sytematically introduced functionalized nanoparticles in mice	0184
Induction of somatic embryo from cotyledonary tissues of cashew ( <i>Anacardium occidentale</i> L.) by in vitro culture	0185
An interactive identification key: the philippine derbidae project	0186
Laboratory scale bioremediation of copper containing wastewater from gold smelting using biogenic hydrogen sulfide	0187
Larger forms in lophiotoma: four new species described in the Philippines and three from elsewhere in the Indo-Pacific	0188
Lemon grass (Cymbopogon citratus)extract: a promising antibacterial juice	0189
Lipid peroxidation and patterns of cadmium and lead accumulation in the vital organs of suckermouth armored catfish <i>Pterygoplichthys pardalis</i> castelnau from Marikina River	0190
Local Vibrio isolates exhibit molecular characteristics distinct from reference V. harveyi and V. campbellii strains	0191
Management of <i>Vibrio</i> infections in fishery industry by antibiotic susceptibility profiling	0192
Mandibular shape variation in the ants <i>Diacamma rugosum</i> and <i>Pheidologeton</i> diversus philippinus	0193
Marine fungi from <i>Kappaphycus Alvarezii</i> and <i>K. Striatum</i> : potential causative agents of ice-ice disease in farmed seaweeds	0194
Masakusikam herbed cookies: incorporation of leaves of malungay (Moringa oleifera), saluyot (Corchorus olitorius), kulitis (Amaranthus spinosus), sili (Capsicum frutescens) and kamote (Ipomea batatas)	0195
Microbial load assessment of some "one town one product (otap)" food products of Ilocos Norte	0196
Modularity and integration in the forewing of the Philippine rice black bug (Scotinophara SPP. stål, hemiptera: pentatomidae)	0197
Molecular cloning of cysteine protease inhibitors from four endemic Philippine	0198

plants

Molecular investigation of cyclotides in Rubiaceae and Cucurbitaceae	0199
Morphological differences in the shapes and venation of wings of selected dragonfly species	0200
Morphometric analysis and DNA barcoding of fruit flies Bactroceraoccipitalis (Bezzi) and B. philippinensis drew and hancock (Diptera: Tephritidae) from Cavite and Davao del Norte	0201
A new genus and species of stick insect (Phasmatodea: Heteronemiidae: Lonchodinae) from the Philippine Islands	0202
A new genus, two new species and a new subspecies of Philippine Ants (Hymenoptera: Formicidae)	0203
Occurrence and diversity of myxomycetes (plasmodial slime molds) in Mt. Palay- palay, National Park, Cavite, Philippines	0204
Occurrence of corticolous myxomycetes from acacia trees ( <i>Samanea samans</i> Merr) collected from different sites in Luzon Island, Philippines	0205
Occurrence of SHV and TEM genes in phenotipically screened-positive extended spectrum ß-lactamases (ESBLS) producing organisms isolates from selected tertiary hospitals (2008)	0206
Optimization of fermentation medium for the production of bioactive compound by <i>Streptomyces sp.</i>	0207
Outline analysis of wing shape variations in four species of damselflies collected from a stream and waterfalls in Iligan City	0208
Phenotypic distinction of enterobacterial flora of houseflies (Musca domestica L.)	0209
Philippine social science in the century of biology engaging the biological dimensions of behavioral and social phenomena	0210
Physiological signaling and adaptation processes to drought and salinity stress interactions in rice	0211
Phytochemical screening and toxicity of some green leafy vegetables consumed in Batac, Ilocos Norte	0212
Plant species diversity and endemism at dihang dibang biosphere reserve and its surroundings, eastern himalaya biodiversity hotspot	0213
Population structure and reproductive biology of <i>Siganus fuscescens</i> Houttuyn 1782 (Perciformes, Siganidae) in Pujada Bay, Southeastern Mindanao, Philippines	0214
A possible role of peptides in the growth enhancement of an industrial strain of <i>Saccharomyces</i> sp.	0215
Preliminary cytogenetic characterization of the golden birdwing, <i>Troides rhadamantus</i> (Lucas) (Lepidoptera: Papilionidae)	0216
Preliminary screening of methanolic extracts of kalingag ( <i>Cinnamomum mercadoi</i> Vindal) and Talisay ( <i>Terminalia catappa</i> ) against methicillin resistant Staphylococcus aureus (MRSA)	0217
Preliminary taxonomic and image catalogue of copepod species (crustacea,	0218

	copepoda) from the neritic waters of Northern Mindanao, Philippines	
	Probiotic property of locally-isolated lactic acid bacteria and development of soya based probiotic product	0219
	Rediscovering job's tears	0220
	The relationship of shell dimensions and shell volume to live weight and soft tissue weight in the mangrove clam, <i>Polymesoda erosa</i> (Solander, 1786) from Northern Australia	0221
	Relative warp analysis and correlation analysis based on distances to study morphological variations in the shell shape of <i>Pomacea canaliculata</i> (Lamarck) found in Iligan City	0222
	Salinity tolerance of introduced South American sailfin catfishes (Loricariidae: Pterygoplichthys GILL 1858)	0223
	Sexual dimorphism and morphometric differentiation among colormorphs of the swordtail fish <i>Xiphophorus helleri</i>	0224
	Simple and rapid screening of antimicrobials in feed samples	0225
	Site-directed mutagenesis identifies putative soil-binding residues of <i>Bacillus</i> subtilis 168 endoglucanase	0226
	Species richness, assessment and conservation of some economically important Philippine lycopods	0227
	Studies on the production and utilization of vermicompost produced with the African Nightcrawler ( <i>Eudrilus eugeniae</i> ) in the Philippines	0228
	Subcellular localization of cadmium in Chlorella vulgaris Beijerinck Strain Bt-09	0229
	Survey and census of ground lizards in the permanent field laboratory areas (PFLAS) in Mt. Makiling forest reserve	0230
	Translocation of the Clupeid <i>Sardinella tawilis</i> to another lake in the Philippines: a proposal and ecological considerations	0231
	Unraveling shrimp immunity by RNA interference technology	0232
	The use of <i>Gus</i> -reporter gene technique in the assessment of the competitive ability of <i>Rhizobium etli</i> nodulating <i>Phaseolus vulgaris</i> L. from the acidic soils of La Trinidad, Benguet, Philippines	0233
	Vaccine development against the Philippine strain of Schistosoma japonicum	0234
	Wing ecomorphology and flight performance of bats in Pisan Cave, Kabacan, North Cotabato, Philippines	0235
	Zooplankton diversity in Philippine Lakes	0236
	Zooplankton spatial abundance and distribution in the West Bay of Laguna de Bay (Philippines) with notes on potential implications to food and health security	0237
B	ioluminescent bacteria	
	Bioluminescent bacteria as bioindicator of marine environmental stress in Iligan City	0144
-	na na sa ana ana ana ana ana ana ana ana	

Bioluminescent reduction and inhibition assay

Bioluminescent bacteria as bioindicator of marine environmental stress in Iligan City	0144
Biomass	
A survey of macro-invertebrate gleaning in the Banate Bay Intertidal Area, Eastern Panay Island	0400
Biomass resource	
Assessment of renewable energy resource potential and application for decentralized rural electrification using geographic information system (GIS)	0281
Biomechanics	
High resolution probing of elastic properties of biopolymers and living cells	0566
Biophysics	
High resolution probing of elastic properties of biopolymers and living cells	0566
Biopolymers	
Elastic properties of a biopolymer	0165
High resolution probing of elastic properties of biopolymers and living cells	0566
Biopro software	
Biodiversity and status of butterflies in the vicinity of Mountain View College, Mt. Nebo, Valencia City	0141
Bioremediation	
Bioremediation: a proven and cost effective tool for repairing the environment	0145
Field growth responses of three tree species to mycorrhiza and fertilizers in the bioremediation of a mine waste dump	0351
Laboratory scale bioremediation of copper containing wastewater from gold smelting using biogenic hydrogen sulfide	0187
Bioremediation potential	
Degradation of pyrene, fluorene and fluoranthene: the role of lignin peroxidase and manganese peroxidase from Ganoderma lucidum	0154
Bioresource management	
Bioresource management and our common future	0146
Biosphere reserve	
Plant species diversity and endemism at dihang dibang biosphere reserve and its surroundings, eastern himalaya biodiversity hotspot	0213
Biotechnology	
Agricultural biotechnology trends and challenges	0130
Bipartite graph	
The minimal closed geodetic numbers of graphs	0418
Bipartite graphs	
A study of singular bipartite graphs	0421

Biphasic calcium phosphate

Porous biphasic calcium phosphate ceramic for anopthalmic socket implant	0497
Bitaog	
Optimization of <i>Jathropha curcas</i> (tubang bakod) and <i>Calophyllum inophyllum</i> (bitaog) as a viable source of activated carbon for methylene blue adsorption	0299
Preliminary investigation of <i>Calophyllum inophyllum</i> (Bitaog) as a potential source of biofuel	0301
Bithreshold system	
Effects of noise coherence on stochastic resonance enhancement in a bithreshold system	0291
Bivalves	
Focal benthic mollusks (Mollusca: Bivalvia and Gastropoda) of selected sites in Tubbataha Reef National Marine Park, Palawan, Philippines	0384
Block copolymers	
Free radical synthesis of endfunctionalized polymers	0259
Blomia tropicalis	
CpG oligodeoxynucleotides as immunomodulators of rBlo t 5-induced allergic reactions	0153
Blood cell counts	
Application of non-conventional acupuncture in sheep, cattle and water buffaloes	0605
Blood coagulation	
Unraveling shrimp immunity by RNA interference technology	0232
Bloodstained denims	
Evaluation and in-house validation of five DNA extraction methods for PCR-based STR analysis of bloodstained denims	0467
Bloodworm	
Use of enriched live prey in promoting growth and maturation of tiger shrimp ( <i>Penaeus monodon</i> )	0341
Blowing up	
On the radiality assumption for existence and blowing up	0428
Boar sperm	
Survival of boar spermatozoa intended for <i>In vitro</i> fertilization (IVF) following different speed, duration and frequency of sperm washing	0116
Body weight	
The influence of body weight and diet on the ammonia excretion of the African catfish <i>Clarias geriepinus</i>	0062
Bone cement	
Irradiated long bone transplants in limb saving surgeries for extremity bone cancers	0481

Bone graft substitute	
Histomorphometry and osteoinductive growth factor levels of fracture callus versus iliac crest bone grafts	0472
Boracay	
Some butterflies of Boracay Island	0278
Boron	
Effects of lahar on the water quality of the rivers and tributaries of Pinatubo volcano	0363
Boron fertilization	
Effects of zinc and boron fertilization on the alleviation of poor crop growth in heavily limed two acidic soils	0043
Boron-potassium	
Influence of boron-potassium fertilizer application on the occurrence of cracking in carrots ( <i>Daucus carrota</i> Linn)	0063
Bos taurus	
Antibody titer response of cattle (Bos taurus) vaccinated with oil and aluminum adjuvanted FMD vaccine (Serotype $O_2$ , $A_{24}$ and $C_3$ )	0005
Botanical conservation	
Floristic inventory of the Luneta Park, Manila	0170
Botany	
Mutation frequency in mungo ( <i>Phaseolus radiatus</i> L.) after treatment with an alkylating chemical mutagen	0238
Boundary layer	
Effect of the diurnal variation of the convective boundary layer height over Metro Manila on pollutant concentration	0315
Brachymeles gracilis	
Survey and census of ground lizards in the permanent field laboratory areas (PFLAS) in Mt. Makiling forest reserve	0230
Brachytherapy	
Clinical techniques for brachytherapy of head and neck tumors	0441
Dosimetry application of gate in prostate brachytherapy	0459
Brackish water site	
Environmental and production survey methodology to estimate severity and extent of aquaculture impact in three areas of the Philippines	0383
A model to estimate aquaculture carrying capacity in three areas of the Philippines	0387
Recommendations for practical measures to mitigate the impact of aquaculture on the environment in three areas of the Philippines	0393
Bradford assay	
A possible role of peptides in the growth enhancement of an industrial strain of <i>Saccharomyces</i> sp.	0215

Bragg peak	
A Monte Carlo simulation study on the interactions of proton, 7Li and 12C with water for hadron therapy application	0549
Braket solution	
Survival of boar spermatozoa intended for <i>In vitro</i> fertilization (IVF) following different speed, duration and frequency of sperm washing	0116
Bray-Curtis analysis	
Biodiversity and status of butterflies in the vicinity of Mountain View College, Mt. Nebo, Valencia City	0141
Bromate	
Ion chromatographic method with post-column fuchsin reaction for measurement of bromate in chlorinated water	0262
Brood pouch	
Histo-physiological development in the gestation of the male seahorse, <i>Hippocampus comes</i> Cantor 1850	0181
Brookes point	
The Identification of metallophytes in the Fe and Cu enriched environments of Brookes Point, Palawan and Mankayan, Benguet and their Implications to Phytoremediation	0261
Brown bentonite	
Preliminary results on the use of clay to control <i>Pyrodinium</i> bloom: a mitigation strategy	0392
BRT	
Bioremediation: a proven and cost effective tool for repairing the environment BSF	0145
Biodegradation of banana stalks and sweet sorghum bagasse under solid state culture of <i>Pleurotus sajor caju</i>	0140
Bt corn	
Survey of alternate host plants of the Asian corn borer Ostrinia furnacalis (Guenee): maramais Trypsacum laxum, in Pangasinan	0114
Bubalus bubalis	
The modified horn ring method as a tool in determining the age of carabao	0606
Buff coconut mealybug	
Invasion of the buff coconut mealybug ( <i>Nipaecoccus nipae</i> ) in U.P. Los Baños campus, elucidation of the confounded "mealybug burn" damage and practical control	0065
Buffalo milk	
Multiplex polymerase chain reaction for simultaneous detection of major mastitis-	0074

causing pathogens in buffalo milk

Buffer solution

Mutation frequency in mungo ( <i>Phaseolus radiatus</i> L.) after treatment with an alkylating chemical mutagen	0238
Bufonidae	
Distribution of anuran species in Loboc Watershed of Bohol Island, Philippines	0157
Bulked segregant analysis	
Mapping of the <i>Rf</i> gene of a cytoplasmic male sterile line of rice ( <i>Oryza sativa</i> L.) developed from a mutagenized source	0069
Buntal fiber	
Status, prospects, and strategic options of buntal fiber industry in Marinduque Bureau of Animal Industry	0112
Exploring the use of theater as an intervention tool for FMD control	0046
Buri extraction	
Status, prospects, and strategic options of buntal fiber industry in Marinduque	0112
Burkinshaw	
The daugavet equation for a sequence of operators	0411
Bush park fishing	
Padal fishing: a unique fishing method in the Ashtamudi estuary of Kerala (South India)	0332
Businesswomen	
The rural women entrepreneurs: their business profiles, entrepreneurial behaviors, management styles, problems and prospects	0280
Buthoxybenzene	
Morphology-controlled polyacetylene films synthesized in liquid crystalline solvents	0265
Butterflies	
Biodiversity and status of butterflies in the vicinity of Mountain View College, Mt. Nebo, Valencia City	0141
Some butterflies of Boracay Island	0278
A checklist of the rhopalocera (lepidoptera) of Mount Arayat, Pampanga, Philippines	0013
Diversity and status of butterflies in Maitum Village, Tandag, Surigao del Sur, Philippines	0158
A taxonomic list of butterflies (lepidoptera:papilionoidea and hesperioidea) from Mount Banahao de Lucban, Quezon Province, Philippines	0118
Butterfly manure	
Butterfly manure: a novel source of bio-organic fertilizer	0011
C-axis	

Utilization of acacia mangium for cement-bonded board manufacture	0123
California Mastitis Test (CMT)	
Multiplex polymerase chain reaction for simultaneous detection of major mastitis- causing pathogens in buffalo milk	0074
Calophyllum inophyllum	
Optimization of <i>Jathropha curcas</i> (tubang bakod) and <i>Calophyllum inophyllum</i> (bitaog) as a viable source of activated carbon for methylene blue adsorption	0299
Calorimetric measurement	
Calorimetric measurements of the output power of the 2.48 GHz commercial magnetron	0518
Camotes Islands	
Assessment on the estuarine areas of Camotes Islands, Central Philippines: their ecology and prospects for milkfish (Chanos chanos) and prawn (Penaeus monodon) industry	0327
Canarium luzonicum	
Essential oil content and antibacterial activity of some Philippine plants	0251
Capabilities approach	
Using the capabilities approach to analyze access to information and communication technologies (ICTS) by the poor	0603
Carbapenem	
Multidrug-resistant esbls in common clinical isolates: first documentation of BLACTX-M genotype in the Philippines	0488
Carbazole	
Microwave-assisted cadogan reaction: its application to synthesis of heterocyclic compounds	0264
Carbohydrates	
Development of biochemical procedures for the diagnosis of genetic disorders Carbon dioxide	0155
Control of the tobacco beetle, <i>Lasioderma serricorne</i> (Fabricius) (Coleoptera: Anobiidae), with carbon dioxide under high pressure	0019
Greenhouse gas emissions of tobacco flue-curing process in the Philippines	0295
Carbon monoxide	
Greenhouse gas emissions of tobacco flue-curing process in the Philippines	0295
A model simulation of air pollution over Metro Manila	0319
Carbon sequestration	
Improving the environment and living conditions of the rural poor: potential of reforestation CDM in the mangrove communities of San Juan Batangas	0352
Carbon storage and sequestration	
Carbon storage and sequestration potential of upland and mangrove forest	0349

ecosystem in Binahaan Watershed and Padre Burgos Quezon	
Carbosulfan	
The fate of pesticides in rice paddy ecosystem using nuclear techniques	0049
Carbosulfuran	
The fate of pesticides in rice paddy ecosystem using nuclear techniques	0049
Cardiovascular disease	
Effect of household level coconut oil usage on the lipid profiles of Filipino women	0370
Cardiovascular risk	
The effect of virgin coconut oil on the cholesterol levels of patients with hypercholesterolemia	0463
Caregiver	
Modified caregiver strain index	0485
Caregiver strain	
Modified caregiver strain index	0485
Carrageena-degrading bacteria	
Characterization of a $\hat{l}^{\circ}$ -Carrageenase-producing marine bacterium, Isolate ALAB-001	0148
Carrageenan	
Factors contributing to the bioburden level of polyvinylpyrrolidone-kappa carrageenan hudrogel	0257
Technological improvements in commercial <i>Eucheuma</i> cultivation: a short communication	0402
Carrageenan-chitosan	
Metal absorption capacities of $\kappa$ -carrageenan blends	0263
Carrageenan-poly- N-isopropyl acrylarnide	
Metal absorption capacities of $\kappa$ -carrageenan blends	0263
Carrying capacities	
Sustainable development of Philippine Lake Resources: an agenda for research and development	0401
Cartesian product	
Convex domination in the composition and cartesian product of graphs	0409
Vertex cover of some supergraphs of planar grid	0432
Caryota cumingii	
Invasion of the buff coconut mealybug ( <i>Nipaecoccus nipae</i> ) in U.P. Los Baños campus, elucidation of the confounded "mealybug burn" damage and practical control	0065
Cassava starch	
Lactic acid fermentation from Jatropha curcas L. press cake and raw cassava starch	0594

using Rhizopus oryzae NRRL-395

Cassia alata L. (akapulko)

The comparative effects of purified fractions of *Vitex negundo L*. (lagundi) and 0447 crude extracts of *Cassia alata L*. (akapulko) and *Artemisia vulgaris L*. (damong maria) on inflammatory processes. *In vitro* 

Casuarina equisetifolia

Field growth responses of three tree species to mycorrhiza and fertilizers in the 0351 bioremediation of a mine waste dump

Cat tien biosphere reserve

Use of edible forest plants among indigenous ethnic minorities in cat tien biosphere 0325 reserve, Vietnam

Catalytic

Effect of pretreatment on the structure and catalytic properties of rice hull-derived 0040 zeolites

Catch

A survey of macro-invertebrate gleaning in the Banate Bay Intertidal Area, Eastern 0400 Panay Island

Catch rates

A survey of macro-invertebrate gleaning in the Banate Bay Intertidal Area, Eastern 0400 Panay Island

Cattle

Application of non-conventional acupuncture in sheep, cattle and water buffaloes	0605
Butterfly manure: a novel source of bio-organic fertilizer	0011
Cave microbiology	
Identification of bacteria isolated from standing and dripping water of Bulalon Cave, Burdeos, Polillo Islands, Quezon Province	0182
CDM	
Improving the environment and living conditions of the rural poor: potential of reforestation CDM in the mangrove communities of San Juan Batangas	0352
Cebu	
The shallow water marine sponges (Porifera) of Cebu, Philippines	0398
Cell death	
Enhanced autophagic cell death in expanded polyhistidine variants of HOXA1 reduces PBX1 coupled transcriptional activity and inhibits neuronal differentiation	0166

Cell mechanics

Elastic properties of a biopolymer0165High resolution probing of elastic properties of biopolymers and living cells0566Cellulase0151

Comparison of conventional plate assays with DNA-based screening protocols for 0151

protease and cellulase production from putative Bacillus isolates	
Cementitious systems	
Investigation of arsenate uptake by hydrotalcite at hyperalkaline and elevated temperature conditions	0296
Cephalosporins	
Multidrug-resistant esbls in common clinical isolates: first documentation of BLACTX-M genotype in the Philippines	0488
Ceramic	
Structure and mechanical property of MgO-ZrO2 ceramic doped with CeO2	0308
Cereals	
Adaptability and management of vegetables legumes and cereals in ashfall and lahar areas	0002
Ceria	
Structure and mechanical property of MgO-ZrO2 ceramic doped with CeO2	0308
Cesium	
Effect of cesium seeding on the production of $H^{\hat{a} \in \mathbb{C}}$ ions in a magnetized sheet plasma source	0525
Cestraeus plicatilis	
Save Ludong, the most delicious and expensive fish in Republic of the Philippines	0334
Chaetanaphothrips orchidii	
Survey, identification and life history of Anthurium thrips	0113
Chaetoceros	
Abundance, composition and distribution of Phytoplankton in Calamianes, Palawan	0129
Channa striata	
Parasitic crustaceans in fishes from some Philippine lakes	0390
Chaos	
High-order correlation functions and correlation dimensions of chaotic systems without noise and chaotic systems with noise	0537
Chaotic system	
High-order correlation functions and correlation dimensions of chaotic systems without noise and chaotic systems with noise	0537
Characteristic dimension ratio	
Physical quality characterization of milled rice using computer vision technique	0300
Charcoal	
Design and development of non-refrigerated storage system for selected fruits and vegetables	0027
Charge-coupled device (CCD)	
Measurement of three-dimensional deformations by phase-shifting digital	0547

holographic interferometry

Chastity shrub	
Pharmacognostical studies on Vitex Negundo L.	0494
Checklist	
A review and revised checklist of the mites (acari) in B.P. Gabriel's "insects and mites injurious to Philippine crop plants"	0104
Chemical	
Mechanical, chemical and surgical methods of contraception	0483
Chemical composition	
Essential oil content and chemical composition of Philippine <i>Cinnamomum mercadoi</i> vidal (Lauraceae)	0252
Essential oil content and chemical composition of Philippine Zingiber officinale Rosc.	0253
Chemical factor	
Development of a simple biological model of vertical phytoplankton distribution	0381
Chemical mass sensor	
Performance evaluation of tailor made microspheres as sensing layer responsive to residual chloramphenicol in food matrices	0493
Chemical properties of materials	
Radiation processing: a versatile technology for industry	0378
Chemical soils (montmorillonite, kaolinite)	
Site-directed mutagenesis identifies putative soil-binding residues of <i>Bacillus</i> subtilis 168 endoglucanase	0226
Chemical soils (montmorillonite, kaolinite, sea sand)	
Bacillus subtilis 168 endoglucanase binds to chemical soils under diverse conditions	0138
Chemiresistor	
Fish freshness analysis using a polyaniline/nylon composite-based chemiresistor sensor	0343
Chemiresistor,	
Chemiresistor electronic nose based on graphite composite for the detection of volatile organic compounds	0243
Chemistry	
<sup>137</sup> Cs and <sup>210</sup> Pb distribution in Manila Bay sediment	0239
Analysis of ecstasy in urine using gas chromatography with mass spectrometry	0240
Antimicrobial activity of the crude ethanol extract of the seeds of <i>Ipomoea muricata</i> (Jacq.) convolvulaceae against selected clinical isolates	0241
Antimicrobial and cytotoxic terpenoids from Cymbopogon citratus Stapf.	0242
Chemiresistor electronic nose based on graphite composite for the detection of	0243
volatile organic compounds

Conductive polymers as host matrices for the dispersion of gold nanoparticles with electrocatalytic properties	0244
The effect of dietary oil on the growth and intellectual capacity of mice	0245
Effect of dopant ions on the electrical conductivity and microstructure of polyaniline (emeraldine salt)	0246
Effect of functional iron oxide nanocrystals on the arsenic level in drinking water	0247
Electrochemical synthesis and characterization of poly(3,4- ethylenedioxythiophene)-supported Pd-Sn nanoparticles dispersed on Au electrode for formic acid oxidation	0248
Electroconductive polythiophene/polyester composite as <i>e</i> -cloth	0249
Environmental mutagenesis, soil studies	0250
Essential oil content and antibacterial activity of some Philippine plants	0251
Essential oil content and chemical composition of Philippine <i>Cinnamomum mercadoi</i> vidal (Lauraceae)	0252
Essential oil content and chemical composition of Philippine Zingiber officinale Rosc.	0253
Fabrication of anodic alumina oxide templates and their use for the electrosynthesis of polythiophene nanowires	0254
Fabrication of chitosan micron and submicron particles for drug sequestration	0255
Fabrication of electrocatalyst based on PEDOT-PSS supported Pd nanoparticles for ethanol electro-oxidation	0256
Factors contributing to the bioburden level of polyvinylpyrrolidone-kappa carrageenan hudrogel	0257
Fortification of sugar with vitamin A-technology generation and transfer	0258
Free radical synthesis of endfunctionalized polymers	0259
Glycerol-crosslinked polyacrylic acid hydrogels	0260
The Identification of metallophytes in the Fe and Cu enriched environments of Brookes Point, Palawan and Mankayan, Benguet and their Implications to Phytoremediation	0261
Ion chromatographic method with post-column fuchsin reaction for measurement of bromate in chlorinated water	0262
Metal absorption capacities of $\kappa$ -carrageenan blends	0263
Microwave-assisted cadogan reaction: its application to synthesis of heterocyclic compounds	0264
Morphology-controlled polyacetylene films synthesized in liquid crystalline solvents	0265
Nanoparticle dispersions in carrageenan films	0266
Occurrence and determination of Haloacetic Acids in Metro Manila drinking water	0267

Polymeric membranes for pressure-driven filtration	0268
Preparation and photoelectrochemical characterization of polyaniline doped with copper phthalocyanine tetrasulfonate	0269
Sedimentation rate estimates in Sorsogon Bay, Philippines using <sup>210</sup> Pb method	0270
Side-chain polymer as matrix in cholesteric liquid crystals/polymer composites	0271
Spectrophotometric analysis of $\alpha$ -tocopherol using emeraldine film	0272
Studies on the utilization of citrus wastes	0273
Synthesis and characterization of chitosan and $\kappa$ -carrageenan IPN hydrogel systems for transdermal drug delivery	0274
Synthesis of glycerol-crosslinked poly(methylmethacrylate) microparticles for the controlled delivery of mosquito repellent	0275
Total mercury in three fish species sold in a Metro Manila Public Market: monitoring and health risk assessment	0276
Water quality analysis and utilization of small farm reservoirs (SFRs) for aquaculture in Region III	0277
Chemometrics.	
Chemiresistor electronic nose based on graphite composite for the detection of volatile organic compounds	0243
Chest x-rays	
Community-based surveillance for drug resistance of mycobacterium tuberculosis in selected areas in the Philippines	0445
Chicken manure	
In situ compositing of rice straw using embased inoculant and chicken manure	0060
Chitosan	
Fabrication of chitosan micron and submicron particles for drug sequestration	0255
Synthesis and characterization of chitosan and $\kappa$ -carrageenan IPN hydrogel systems for transdermal drug delivery	0274
Chloramphenicol	
Performance evaluation of tailor made microspheres as sensing layer responsive to residual chloramphenicol in food matrices	0493
Chlorella vulgaris	
Subcellular localization of cadmium in Chlorella vulgaris Beijerinck Strain Bt-09	0229
Chloride	
Effects of lahar on the water quality of the rivers and tributaries of Pinatubo volcano	0363
Chloride as coconut nutrient	
Coconut yield and profitability under two practical fertilizer options: common salt (sodium chloride) and multi-nutrient 14N-5P2O5-20K2O- 15CI-4.5S-0.02B applications on bearing trees (technology notes)	0014
Chlorinated water	

Ion chromatographic method with post-column fuchsin reaction for measurement of bromate in chlorinated water	0262
Chlorination	
Occurrence and determination of Haloacetic Acids in Metro Manila drinking water	0267
Chlorophyll mutant	
PNRI mutant variety: Cordyline 'Afable'	0091
Chlorpyrifos	
The fate of pesticides in rice paddy ecosystem using nuclear techniques	0049
Cholesterol	
Effect of household level coconut oil usage on the lipid profiles of Filipino women	0370
The effect of virgin coconut oil on the cholesterol levels of patients with hypercholesterolemia	0463
The effectiveness of the use of soybean powdered drink as supplement to lipid lowering agents vs. lipid lowering agents alone in hypercholesterolemia	0465
Chromatic number	
Unit graphs: dimension and span	0431
Chromatography	
Comparative antidiabetic activity determination and characterization of potentially active metabolites from the leaves of <i>Syzygium malacunse</i> (makopa) and <i>Momordica charantia</i> (ampalaya)	0369
Cyclosporin analysis in blood by automated reserved-phase high performance liquid chromatographic method coupled with solid phase extraction and speed vacuum evaporation	0455
A possible role of peptides in the growth enhancement of an industrial strain of <i>Saccharomyces</i> sp.	0215
Studies on the utilization of citrus wastes	0273
Chromolaena odorata	
Antimicrobial activity of <i>Chromolaena odorata</i> (L. f.) King & Robinson and <i>Uncaria perrottetii</i> (A. Rich) Merr. <i>extracts</i>	0131
Chromosomes	
Preliminary cytogenetic characterization of the golden birdwing, <i>Troides rhadamantus</i> (Lucas) (Lepidoptera: Papilionidae)	0216
Chronic cough	
The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0439
Chronic disease	
Modified fall risk assessment tool among elderly diagnosed with chronic disease	0486
Chronic idiopathic urticaria (CIU)	

Chronic idiopathic urticaria (CIU), unveiled	0438
Chronic urticaria	
Chronic idiopathic urticaria (CIU), unveiled	0438
Chrysoplenol D	
Phytochemical studies on the leaves of Vitex negundo L. (lagundi)	0496
CIC model	
Sedimentation rate estimates in Sorsogon Bay, Philippines using <sup>210</sup> Pb method	0270
Cinnamic aldehyde	
Essential oil content and chemical composition of Philippine <i>Cinnamomum mercadoi</i> vidal (Lauraceae)	0252
Cinnamomum mercadoi	
Essential oil content and chemical composition of Philippine <i>Cinnamomum mercadoi</i> vidal (Lauraceae)	0252
Cinnamomum mercadoi Vidal	
Essential oil content and antibacterial activity of some Philippine plants	0251
Circular pipe	
Onset of turbulence in planar and circular pipe	0559
Circulin A	
Molecular investigation of cyclotides in Rubiaceae and Cucurbitaceae	0199
Cirrhosis of the liver	
Cross-sectional study of the alcohol use among elderly patients seen in the Veterans Memorial Medical Center Medical Out-Patient Clinic using alcohol screening aid of the National Institute on Alcohol Abuse and Alcoholism	. 0452
Citral	
Antimicrobial and cytotoxic terpenoids from Cymbopogon citratus Stapf.	0242
Citrus	
Easy methods of propagating citrus	0037
Citrus limon	
A review of the genus ultratenuipalpus mitrofanov (acari:tenuipalpidae) with descriptions of two new species from the Philippines	0105
Cladocera	
Zooplankton diversity in Philippine Lakes	0236
Clarias batrachus Linnaeus	
Salinity tolerance of freshwater catfish ( <i>Clarias batrachus</i> Linnaeus and <i>Clarias macrocephalus</i> Gunther) in aquaria in the laboratory of CSCST-Fishery and Industrial College, San Francisco, Cebu	0333
Clarias gariepinus	
The influence of body weight and diet on the ammonia excretion of the African	0062

catfish Clarias geriepinus

Clarias macrocephalus Gunther

	1	
Sali <i>mac</i> Indu	nity tolerance of freshwater catfish ( <i>Clarias batrachus</i> Linnaeus and <i>Clarias crocephalus</i> Gunther) in aquaria in the laboratory of CSCST-Fishery and ustrial College, San Francisco, Cebu	0333
Clay		
Prel strat	liminary results on the use of clay to control <i>Pyrodinium</i> bloom: a mitigation tegy	0392
Cleara	ance measurements	
Min radi	nimum detectable activity of a 5x5 NaI T1) gamma spectrometer used for the oactivity clearance measurements of the PRR-1 decommissioning project	0364
Cleom	ne rutidosperma	
Con chlo	nparison of pollen abortiveness in four weed species treated with mercuric oride	0152
Climat	te change	
Carl ecos	bon storage and sequestration potential of upland and mangrove forest system in Binahaan Watershed and Padre Burgos Quezon	0349
Clima	te variables	
Fore time	ecasting dengue incidence in the National Capital Region, Philippines: using e series analysis with climate variables as predictors	0415
Clinica	al epidemiology	
The Sors tube	clinical epidemiology of pulmonary paragonimiasis and tuberculosis in sogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and erculosis in Sorsogon, Philippines	0439
Clinic	al features	
Core	onary-cameral fistula: a case report	0451
Clinic	al isolates	
Anti (Jac	imicrobial activity of the crude ethanol extract of the seeds of <i>Ipomoea muricata</i> eq.) convolvulaceae against selected clinical isolates	0241
Clinop	otilolite	
Cha	racteristics of Pangasinan zeolite as a molecular sieve for bioethanol	0284
Clique		
Con	evex domination in the composition and cartesian product of graphs	0409
Clopic	dogrel	
Sing mar	gle nucleotide polymorphism genotyping of antithrombotic therapy resistance kers using high resolution melt analysis	0508
Closte	erium spp.	
Foo	d and feeding habits of Synodontis nigrita from the Osun River, SW Nigeria	0172
Clottir	ng protein	

Unraveling shrimp immunity by RNA interference technology	0232
Cloxacillin	
In vitro study on the bactericidal effects of freshly prepared colloidal silver	0478
Clupeidae	
Translocation of the Clupeid <i>Sardinella tawilis</i> to another lake in the Philippines: a proposal and ecological considerations	0231
Cluster computing	
Development of a Beowulf-Class High Performance Computing System for Computational Science Applications	0604
Co layer	
Enhancement of Fe magnetic moments in Fe/Co (001) multilayers	0530
Co-management arrangements	
The relevance of governance institutions in marine protected area design and management: lessons from Northeastern Iloilo, Philippines	0394
CO2 emission	
Reducing fossil fuel emission using treadle pump technology	0303
Coco-cholesteryl esters	
Side-chain polymer as matrix in cholesteric liquid crystals/polymer composites	0271
Coco-methyl ester (CME)	
ASU to produce biodiesel from waste fats	0008
Coconut	
Analysis of genetic diversity in coconut by RAPD	0004
Coconut farming	
Assessment of economic losses caused by coconut mite through farmers': participatory research appraisal	0007
Profitability of Coconut production: an analysis of farm size, rental, cost, inorganic fertilization, and copra price during a five-year cropping cycle period (technology notes)	0095
Coconut fertilization	
Assessment of economic losses caused by coconut mite through farmers': participatory research appraisal	0007
Coconut yield and profitability under two practical fertilizer options: common salt (sodium chloride) and multi-nutrient 14N-5P2O5-20K2O- 15CI-4.5S-0.02B applications on bearing trees (technology notes)	0014
Profitability of Coconut production: an analysis of farm size, rental, cost, inorganic fertilization, and copra price during a five-year cropping cycle period (technology notes)	0095
Coconut husk fiber	
Coconut fiber reinforced composite new technology approach to age-old solutions	0587

Coconut mite	
Assessment of economic losses caused by coconut mite through farmers': participatory research appraisal	0007
Coconut oil	
Microemulsified hybrid fuel from jatropha and coconut oils	0595
Coconut productivity	
Profitability of Coconut production: an analysis of farm size, rental, cost, inorganic fertilization, and copra price during a five-year cropping cycle period (technology notes)	0095
Coconut sap sugar	
Creating a master plan for coconut sap sugar	0021
Coconut scale	
Biological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)	0142
Coconut-specific-multi-nutrient	
Profitability of Coconut production: an analysis of farm size, rental, cost, inorganic fertilization, and copra price during a five-year cropping cycle period (technology notes)	0095
Coconute oil	
The effect of dietary oil on the growth and intellectual capacity of mice	0245
Cocos nucifera	
Invasion of the buff coconut mealybug ( <i>Nipaecoccus nipae</i> ) in U.P. Los Baños campus, elucidation of the confounded "mealybug burn" damage and practical control	0065
Coding theory	
On the number of distinct self-dual codes over Z <sub>9</sub>	0427
COGO	
Survey of trees using ArcGIS offset line and digicam tree measurement techniques	0356
Coherent	
Effects of noise coherence on stochastic resonance enhancement in a bithreshold system	0291
Cold vapor atomic absorption spectrophotometry	
Total mercury in three fish species sold in a Metro Manila Public Market: monitoring and health risk assessment	0276
Coleoptera	
Biology of the orchid weevil, Orchidophilus aterrimus (waterhouse)	0143
Colistin	
Comparative treament of <i>Pseudomonas aeruginosa</i> burn wound infection using bacteriophage MB08 and antibiotics	0150
Collisional radiative (CR)	

Profile analysis of hydrogenic helium ions in a magnetized sheet plasma	0563
Colloidal silver	
In vitro study on the bactericidal effects of freshly prepared colloidal silver	0478
Commelina diffusa	
Comparison of pollen abortiveness in four weed species treated with mercuric chloride	0152
Commercial pellets	
The influence of body weight and diet on the ammonia excretion of the African catfish <i>Clarias geriepinus</i>	0062
Common complete vector	
The daugavet equation for a sequence of operators	0411
Common salt as fertilizer	
Coconut yield and profitability under two practical fertilizer options: common salt (sodium chloride) and multi-nutrient 14N-5P2O5-20K2O- 15CI-4.5S-0.02B applications on bearing trees (technology notes)	0014
Communication technologies	
Using the capabilities approach to analyze access to information and communication technologies (ICTS) by the poor	0603
Communities in transition	
Spill-over effects of rural industrialization on community transformation	0322
Community-based initiatives	
The relevance of governance institutions in marine protected area design and management: lessons from Northeastern Iloilo, Philippines	0394
Compaction	
Rice husk ash as soil stabilizer	0306
Complementing permutation	
On construction of a quasi-regular self-complementary graph	0407
Complex partitioned matrices	
Decompositions involving quaternion matrices and complex partitioned matrices	0412
Complex systems	
Tracking the dynamic variations in a social network formed through shared interests	0584
Composite fabric	
Electroconductive polythiophene/polyester composite as e-cloth	0249
Composition	
Convex domination in the composition and cartesian product of graphs	0409
Compost	
Effect of mykovam, beneficial indigenous microbes and compost for improved growth of <i>Terminalia catappa</i> in an acidic infertile soil	0161

Computational science applications	
Development of a Beowulf-Class High Performance Computing System for Computational Science Applications	0604
Computer vision	
Physical quality characterization of milled rice using computer vision technique	0300
Computer vision system (eVS)	
Development of a computer vision system for milled rice quality analysis	0030
Computer-aided identification key	
An interactive identification key: the philippine derbidae project	0186
Conacea	
Larger forms in lophiotoma: four new species described in the Philippines and three from elsewhere in the Indo-Pacific	0188
Concentration	
Nucleonic gauges in Philippine industry: current application	0377
Seed quality response to fungicide treatment of a line and F <sub>1</sub> hybrid seeds	0109
Condensation reaction	
Rapid synthesis under mild conditions of an acrylic diamide N, N, N', N'T etrabutylphthalamide, a potential antimicrobial agent	0599
Conducting polymer	
Preparation and photoelectrochemical characterization of polyaniline doped with copper phthalocyanine tetrasulfonate	0269
Conducting polymers	
Chemiresistor electronic nose based on graphite composite for the detection of volatile organic compounds	0243
Effects of applied voltage on the mean diameter of electrospun polyaniline (PANI)- elastomeric adhesive fiber	0589
Conductive polymers	
Conductive polymers as host matrices for the dispersion of gold nanoparticles with electrocatalytic properties	0244
Conjugacy class	
Some characterizations of the direct product of gassmann triples	0406
Conjugate subgroups	
Some characterizations of the direct product of gassmann triples	0406
Conservation	
Diversity and status of butterflies in Maitum Village, Tandag, Surigao del Sur, Philippines	0158
Diversity and status of plants in three mountain ecosystems in Southern Mindanao, Philippines	0314

Philippine biodiversity: ecological roles, uses, and conservation status	0279
Socio-economic conditions and perceptions on the conservation of Tubbataha Reefs and vicinity: a households survey in Cagayancillo, Palawan	0320
Species richness, assessment and conservation of some economically important Philippine lycopods	0227
Constructed wetland	
The efficiency and social acceptability of the constructed wetland of Bayawan City, Negros Oriental	0316
Consumption	
Corn in the Philippines: feeding the population beyond the present	0020
Contamination	
Bioluminescent bacteria as bioindicator of marine environmental stress in Iligan City	0144
Contingent valuation method	
Will mangrove reforestation provide net benefits: a case in Sibunag, Guimaras	0318
Control	
Design and development of smart karwats: a GSM based car security system with GPS tracking capability	0285
Convergence theorem	
A convergence theorem without pointwise covergence	0408
Conversion	
Eco-stairs	0288
Convex	
Convex domination in the composition and cartesian product of graphs	0409
Convolvulaceae	
Antimicrobial activity of the crude ethanol extract of the seeds of <i>Ipomoea muricata</i> (Jacq.) convolvulaceae against selected clinical isolates	0241
Cookies	
Masakusikam herbed cookies: incorporation of leaves of malungay (Moringa oleifera), saluyot (Corchorus olitorius), kulitis (Amaranthus spinosus), sili (Capsicum frutescens) and kamote (Ipomea batatas)	0195
Copepoda	
Zooplankton diversity in Philippine Lakes	0236
Copepods	
Preliminary taxonomic and image catalogue of copepod species (crustacea, copepoda) from the neritic waters of Northern Mindanao, Philippines	0218
Copper	
Effects of arbuscular mycorrhizal fungi inoculation on growth and Cu uptake and toxicity of <i>Desmodium cinereum</i> (Kunth) D.C.	0162

Laboratory scale bioremediation of copper containing wastewater from gold smelting using biogenic hydrogen sulfide	0187
Copper pthalocyanine tetrasulfonate (CuPcTS)	
Preparation and photoelectrochemical characterization of polyaniline doped with copper phthalocyanine tetrasulfonate	0269
Copra	
Profitability of Coconut production: an analysis of farm size, rental, cost, inorganic fertilization, and copra price during a five-year cropping cycle period (technology notes)	0095
Copra price	
Profitability of Coconut production: an analysis of farm size, rental, cost, inorganic fertilization, and copra price during a five-year cropping cycle period (technology notes)	0095
Coral reef	
Low-level color and texture feature extraction of coral reef components	0545
Coral reefs	
A post-tsunami assessment of coastal living resources of Langkawi Archipelago, Peninsular Malaysia	0391
Sedimentation rate in fringing reefs of Honda Bay, Puerto Princesa City, Palawan, Philippines with reference to coral reef condition	0335
Cordierite	
Synthesis and characterization of cordierite prepared from mixtures of Philippine Kaolinite Clay, Talc, and other additives	0310
Cordillera Central Range	
Geographic variation in vegetative and flower morphometry among populations of <i>Lilium philippinense</i> Baker (liliaceae), an endemic species in the Philippines	0179
Cordyline	
PNRI mutant variety: Cordyline 'Afable'	0091
Corn	
Corn in the Philippines: feeding the population beyond the present	0020
Effects of zinc and boron fertilization on the alleviation of poor crop growth in heavily limed two acidic soils	0043
The fecundity and fertility of field collected and corn stalk collected asian corn borer, <i>Ostrinia furnacalis</i> Guenee	0050
Improving the production of corn and rice with controlled availability fertilizer (CAF) in Pinatubo Lahar	0059
Corn earworm	
Effects of gamma radiation on the testicular cells of corn earworm [helicoverpa armigera (Hubner)]	0163

Corn growing

A descriptive model of cropping decision making application to crop diversification in irrigated rice farms	0026
Coronary artery fistula	
Coronary-cameral fistula: a case report	0451
Correlation analysis	
Relative warp analysis and correlation analysis based on distances to study morphological variations in the shell shape of <i>Pomacea canaliculata</i> (Lamarck) found in Iligan City	0222
Correlation coefficient	
Determination of weight percentage moldy corn kernels from bulk samples using flatbed scanner	0028
Corrosion	
Electrochemical synthesis and corrosion performance of polypyrrole and poly(pyrrole-co-aniline) films on copper	0590
Corynespora cassiicola	
Rubber disease enters Republic of the Philippines; found in Mindanao	0107
Coscinodiscus	
Abundance, composition and distribution of Phytoplankton in Calamianes, Palawan	0129
Cost-benefit analysis	
The economic impact of FMD and its control in the Philippines	0039
Will mangrove reforestation provide net benefits: a case in Sibunag, Guimaras	0318
Cost-effectlyeness	
Research and development of the spiral pump for water-disadvantaged areas in the Philippines: part I. statistically aided design of prototypes at Los Banos	0101
Research and development of the spiral pump for water-disadvantaged areas in the Philippines: part II. field tests under actual farm conditions in Abra	0102
Cotesia plutellae	
Technology transfer of <i>Cotesia</i> -based IPM for diamondback moth on lowland elevation crucifers in Luzon	0120
Cotton	
Evaluation of the effectiveness of fabric stain removers	0591
Cotton growing	
A descriptive model of cropping decision making application to crop diversification in irrigated rice farms	0026
Cotyledonary explant	
Induction of somatic embryo from cotyledonary tissues of cashew (Anacardium occidentale L.) by in vitro culture	0185
CR-39 radon detectors	

Occupational exposure to radon in non-uranium underground mines in the Philippines	0557
Craking	
Influence of boron-potassium fertilizer application on the occurrence of cracking i carrots ( <i>Daucus carrota</i> Linn)	n 0063
Crassostrea madrasensis (edible oyster)	
Padal fishing: a unique fishing method in the Ashtamudi estuary of Kerala (South India)	0332
Crevices	
Histo-physiological development in the gestation of the male seahorse, <i>Hippocampus comes</i> Cantor 1850	0181
Croatian fermentation medium	
Optimization of fermentation medium for the production of bioactive compound be <i>Streptomyces sp.</i>	y 0207
Crop cover	
Productivity and soil erosion in various crop cover in the mountainous areas of Bondoc Peninsula, Philippines	0094
Crop protection	
Pestnet: an inexpensive diagnostics and pest management advisory tool for crop protection practitioners in the Philippines	0086
Crosslinking	
Glycerol-crosslinked polyacrylic acid hydrogels	0260
Crotaiaria sp.	
Alternative management strategies against the rice root-knot nematode, Meioidogyne graminicoia in rice-onion system	0003
Crucifers	
Technology transfer of <i>Cotesia</i> -based IPM for diamondback moth on lowland elevation crucifers in Luzon	0120
Crude extracts	
The comparative effects of purified fractions of <i>Vitex negundo L</i> . (lagundi) and crude extracts of <i>Cassia alata L</i> . (akapulko) and <i>Artemisia vulgaris L</i> . (damong maria) on inflammatory processes. <i>In vitro</i>	0447
Crustacea	
Marine copepods: a potential rich source of omega-3 polyunsaturated fatty acids, a dietary supplement for healthy aging	a 0373
Preliminary taxonomic and image catalogue of copepod species (crustacea, copepoda) from the neritic waters of Northern Mindanao, Philippines	0218
Cs-137	
<sup>137</sup> Cs and <sup>210</sup> Pb distribution in Manila Bay sediment	0239

Cubic construction	
Cubic construction over binary cyclic codes	0410
Cubic polynomial equation	
On sufficient condition for the existence of imaginary roots of a cubic polynomial equation	0422
Cucurbitaceae	
Molecular investigation of cyclotides in Rubiaceae and Cucurbitaceae	0199
Cucurbitaceous	
Identification of ribosome-inactivating protein (RIP) in selected plants for medicinal plant properties screening	0183
Cultural diversity	
Cultural diversity: the Filipino client providing culturally sensitive education on breast cancer and early screening	0453
Cultural status	
Women in the December 26 tsunami: how have they coped; how can we help?	0404
Culture media	
Sweet sorghum jaggery as alternative media for the production of commercial yeast	0117
Culture-Responsive Curriculum for Indigenous Peoples (CCIP)	
A multicultural teaching framework for physics	0550
Cultured stocks	
Genetic diversity in wild stocks of the giant freshwater prawn ( <i>Macrobrachium rosenbergii</i> ): implications for aquaculture and conservation	0330
Curculionidae	
Biology of the orchid weevil, Orchidophilus aterrimus (waterhouse)	0143
Cuticle-degrading enzymes	
Cuticle-degrading enzyme activity of <i>Metarhizium anisopliae</i> (METSCH.) Sorok. isolates pathogenic to asian corn borer larvae	0023
Cutworms	
Damage assessment of lepidopterous pests of onion in Nueva Ecija	0024
Cyanobacteria	
Bathymetry and hydrobiology of Lake Mahagnao, Leyte	0380
Cyclosporin	
Cyclosporin analysis in blood by automated reserved-phase high performance liquid chromatographic method coupled with solid phase extraction and speed vacuum evaporation	0455
Cyclotides	
Molecular investigation of cyclotides in Rubiaceae and Cucurbitaceae	0199
Cycloviolacin 01	

Molecular investigation of cyclotides in <i>Rubiaceae</i> and <i>Cucurbitaceae</i>	0199
Cylinder cup assay	
Optimization of fermentation medium for the production of bioactive compound by <i>Streptomyces sp.</i>	0207
Cymbopogon citrates	
Lemon grass (Cymbopogon citratus)extract: a promising antibacterial juice	0189
Cymbopogon citratus	
Essential oil content and antibacterial activity of some Philippine plants	0251
Cymbopogon citratus Stapf.	
Antimicrobial and cytotoxic terpenoids from Cymbopogon citratus Stapf.	0242
Cymbopogonol	
Antimicrobial and cytotoxic terpenoids from Cymbopogon citratus Stapf.	0242
CYP2D6*10	
Genetic polymorphism of CYP2D6*10 gene among Filipinos	0470
Cyprindae	
Influence of music on the growth of koi carp, Cyprinus carpio (Pisces:Cyprindae)	0331
Cyprinus carpio	
Influence of music on the growth of koi carp, Cyprinus carpio (Pisces:Cyprindae)	0331
Cysteine protease inhibitors	
Molecular cloning of cysteine protease inhibitors from four endemic Philippine plants	0198
Cytochrome	
Single nucleotide polymorphism genotyping of antithrombotic therapy resistance markers using high resolution melt analysis	0508
Cytochrome oxidase I gene	
DNA barcoding of birds in the University of the Philippines, Diliman Campus, with emphasis on striated grassbirds <i>Megalurus palustris</i>	0159
Cytogenetics	
Cellular and karyological variations in populations of green leafhopper <i>Nephotettix virescens</i> (distant) in the Philippines	0147
Cytoplasmic male sterility	
Mapping of the <i>Rf</i> gene of a cytoplasmic male sterile line of rice ( <i>Oryza sativa</i> L.) developed from a mutagenized source	0069
Cytotoxic	
Antimicrobial and cytotoxic terpenoids from Cymbopogon citratus Stapf.	0242
Dacinae	
Morphometric analysis and DNA barcoding of fruit flies Bactroceraoccipitalis (Bezzi) and B. philippinensis drew and hancock (Diptera: Tephritidae) from Cavite	0201

and Davao del Norte

Daily intake	
Phytochemical screening and toxicity of some green leafy vegetables consumed in Batac, Ilocos Norte	0212
Dalanghita (Citrus aurantium L.)	
Studies on the utilization of citrus wastes	0273
Damage assessment	
Damage assessment of lepidopterous pests of onion in Nueva Ecija	0024
Damselflies	
Contribution to the taxonomy of Philippine megapodagrionidae (odonata:zygoptera)	0018
Outline analysis of wing shape variations in four species of damselflies collected from a stream and waterfalls in Iligan City	0208
Danaus chrysippus	
Butterfly manure: a novel source of bio-organic fertilizer	0011
Daphnia	
On the dynamics of resource-consumer-toxicant systems II: stress effects on reproduction and their implications on the survival of a population	0425
Daugavet equation	
The daugavet equation for a sequence of operators	0411
DBA_DOSE	
DBA_DOSE: a PC program for stack design and the PRR-1 design basis accident	0360
Death	
Impacts of a patient's death under a health provider's care	0476
Debye length	
Incompressible limit of the compressible euler-poisson system for general initial data	0417
Decoction	
Glycemic effect of betel nut (Areca catechu Linn.) fruit	0371
Decommissioning	
Minimum detectable activity of a 5x5 NaI T1) gamma spectrometer used for the radioactivity clearance measurements of the PRR-1 decommissioning project	0364
Decompisition rate	
Organic matter residue management for the improvement of soil quality in lowland rice systems	0083
Decongestants	
Practice patterns of physicians in the management of patients admitted for acute sinusitis in Chong Hua Hospital, January 2003 - June 2006	0498
Deep chlorophyll maximum (DCM) depth	

Development of a simple biological model of vertical phytoplankton distribution	0381
Deep level transient spectroscopy (DLTS)	
Electron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Off-axis substrates	0529
DEET	
Synthesis of glycerol-crosslinked poly(methylmethacrylate) microparticles for the controlled delivery of mosquito repellent	0275
Defense	
Identification of ribosome-inactivating protein (RIP) in selected plants for medicinal plant properties screening	0183
Deforestation	
Relative sea level changes and worsening floods in the Western Pampanga Delta: causes and some possible mitigation measures	0366
Deformation	
Deformation quantization and quantum moment maps	0413
Dehumidification efficiency	
Heat pump drying of onion (Allium cepa)	0056
Delta	
Compaction rates and paleo-sea levels along the delta complex north of Manila Bay, Luzon Island, Philippines	0359
Demographic crisis.	
The economic impact of the demographic crisis: its implications on public policy	0601
Demographic variables	
Determinants of compliance to therapeutic regimen among selected Filipino juvenile diabetics	0457
Dendrocalamus latiflorus	
Propagation of machiku bamboo through air layering	0096
Dengue	
Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and 2	0444
Dengue fever profile in the province of South Cotabato	0456
Dengue fever	
Growth patterns and infectivity of a dengue-2 virus strain propagated in the human myelomomocytic cell line K562	0471
Dengue incidence	
Forecasting dengue incidence in the National Capital Region, Philippines: using time series analysis with climate variables as predictors	0415
Dengue shock syndrome	

Growth patterns and infectivity of a dengue-2 virus strain propagated in the human myelomomocytic cell line K562	0471
Dengue virus	
Growth patterns and infectivity of a dengue-2 virus strain propagated in the human myelomomocytic cell line K562	0471
Dengue-2 viruses	
Growth patterns and infectivity of a dengue-2 virus strain propagated in the human myelomomocytic cell line K562	0471
Density	
The effect of deposition time on textured magnesium diboride thick films fabricated by electrophoretic deposition	0289
Nucleonic gauges in Philippine industry: current application	0377
DepEd	
A multicultural teaching framework for physics	0550
Deposition	
Optimized extraction of $H^{\hat{a} \in "}$ by three-electrode faraday cup system in magnetized sheet plasma ion source	0562
Depression	
Being diabetic: symptom distress and quality of life	0368
The effect of individual versus group psychotherapy among grade six students with depression	0461
The prevalence of depression in the elderly at Area C, San Martin II, Sapang Palay, Del Monte Bulacan	0501
Depth	
Review of the biodiversity of Southern Philippine Seas	0395
Derbidae	
An interactive identification key: the philippine derbidae project	0186
Derivatives	
Fractional calculus and their applications	0416
Desmodium cinereum	
Effects of arbuscular mycorrhizal fungi inoculation on growth and Cu uptake and toxicity of <i>Desmodium cinereum</i> (Kunth) D.C.	0162
Detritus	
Food and feeding habits of Synodontis nigrita from the Osun River, SW Nigeria	0172
Deuterium	
Environmental isotope techniques in the lake-aquifer interaction between Laguna Lake and the aquifer in the south sector of Metro Manila	0317
Developmental biology	

Developmental Biology of the Supermale YY Tilapia ( <i>Oreochromis niloticus</i> ): histogenesis of the reproductive system	0156
Dewatering	
Rice husk ash as soil stabilizer	0306
Diabasic	
Zambales ophiolite complex mafic dikes in upper mantle rock suites: distinct short- lived island arc magmatisms	0367
Diabetes	
Comparative antidiabetic activity determination and characterization of potentially active metabolites from the leaves of <i>Syzygium malacunse</i> (makopa) and <i>Momordica charantia</i> (ampalaya)	0369
Complementary alternative medicine usage among diabetic patients of Ospital ng Maynila Medical Center from January 2004 - June 2005	0450
Creating a master plan for coconut sap sugar	0021
Cross-sectional study of the alcohol use among elderly patients seen in the Veterans Memorial Medical Center Medical Out-Patient Clinic using alcohol screening aid of the National Institute on Alcohol Abuse and Alcoholism	0452
Diabetes and childbearing: exploring the options	0458
Hypoglycemic activity determination and characterization of potentially active metabolite(s) from the root crop <i>Smallantus sonchifolius</i> (yacon)	0372
The rifasaf project: a case-control study on risk factors for stroke among Filipinos	0505
Diabetic	
Being diabetic: symptom distress and quality of life	0368
Diacamma rugosom	
Mandibular shape variation in the ants <i>Diacamma rugosum</i> and <i>Pheidologeton</i> diversus philippinus	0193
Diatom	
Species account of marine diatoms of the genus <i>Pseudo-nitzschia</i> in San Pedro Bay, Philippines	0321
Diatoms	
Abundance, composition and distribution of Phytoplankton in Calamianes, Palawan	0129
A checklist of Navicula (Class Bacillariophyceae) of the Philippines	0149
Dichromothrips corbetti	
Some factors affecting mass rearing of the Vanda thrips, Dichromothrips corbetti (priesner) (thysanoptera: thripidae)	0047
Didymium sp.	
Occurrence of corticolous myxomycetes from acacia trees (Samanea samans Merr) collected from different sites in Luzon Island, Philippines	0205
Diels-Alder	

Halogen-free, imidazolium based ionic liquids for organic and inorganic syntheses	0593
Diet	
Effect of household level coconut oil usage on the lipid profiles of Filipino women	0370
The influence of body weight and diet on the ammonia excretion of the African catfish <i>Clarias geriepinus</i>	0062
Dietary fiber intake	
The effectiveness of thinber on weight reduction as an adjunct to low calorie diet prescription among adults: a randomized controlled study	0466
Dietary intake	
Physical activity, energy requirements and adequacy of dietary macro- and micronutrient intakes of older persons in a rural Filipino community	0374
Dietary oil	
The effect of dietary oil on the growth and intellectual capacity of mice	0245
Diethylcarbamazine citrate	
A family health care model for the implementation of mass annual treatment with diethylcarbamazine citrate for the elimination of filariasis in the Philippines	0468
Differential equation	
Fractional calculus and their applications	0416
Differentiation	
Learning capability of a silnple neural network	0543
Dilang baka	
Cactus: nature's phytochemical specialist	0012
Dimension	
High-order correlation functions and correlation dimensions of chaotic systems without noise and chaotic systems with noise	0537
Unit graphs: dimension and span	0431
Dioecious	
Some aspects of the reproduction in the elongate sunset clam, <i>Gari elongata</i> (Lamarck 1818) from Banate Bay Area, West Central Philippines	0379
Dioritic	
Zambales ophiolite complex mafic dikes in upper mantle rock suites: distinct short- lived island arc magmatisms	0367
Direct product of subgroups	
Some characterizations of the direct product of gassmann triples	0406
Directly observed treatment short course	
Treatment outcomes of pulmonary TB patients enrolled at the Unilab-DOTS Center	0375
Disaster food	
Quick-cooking rice processes for Philippine rice cultivars	0346

Discriminant analysis	
Physical quality characterization of milled rice using computer vision technique	0300
Disease	
High incidence of land snails mortality at Mt. Arayat, Pampanga: an evidence of global warming	0061
Disinfectant	
The antiseptic activity of Psidium guajava essential oil	0133
Disinfection by-products	
Occurrence and determination of Haloacetic Acids in Metro Manila drinking water	0267
Displacement method	
Elastic-plastic analysis of underground openings by the finite element method	0292
Display-type evaporative cooler	
Design and development of non-refrigerated storage system for selected fruits and vegetables	0027
Distance	
Unit graphs: dimension and span	0431
Distilled water	
Mutation frequency in mungo ( <i>Phaseolus radiatus</i> L.) after treatment with an alkylating chemical mutagen	0238
Distinct self-dual codes	
On the number of distinct self-dual codes over Z <sub>9</sub>	0427
Diurnal variation	
A model simulation of air pollution over Metro Manila	0319
Diversity	
Diversity and status of butterflies in Maitum Village, Tandag, Surigao del Sur, Philippines	0158
Diversity and status of plants in three mountain ecosystems in Southern Mindanao, Philippines	0314
Preliminary taxonomic and image catalogue of copepod species (crustacea, copepoda) from the neritic waters of Northern Mindanao, Philippines	0218
State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan	0323
Diversity and threats to mangrove (cutting)	
State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan	0323
DNA	
Sex preselection in animals: current methods and applications	0507
DNA barcoding	

DNA barcoding of birds in the University of the Philippines, Diliman Campus, with emphasis on striated grassbirds <i>Megalurus palustris</i>	0159
DNA extraction	
Evaluation and in-house validation of five DNA extraction methods for PCR-based STR analysis of bloodstained denims	0467
DNA sequencing	
Genetic diversity of Philippine <i>Trichomonas vaginalis</i> isolates using the 5.8S ribosomal RNA gene	0177
Dolomite	
Mechanism of $H_2S$ absorption using calcium-based sorbents under in-situ coal gasification conditions	0484
Domestic effluents	
The efficiency and social acceptability of the constructed wetland of Bayawan City, Negros Oriental	0316
Domestication	
Use of edible forest plants among indigenous ethnic minorities in cat tien biosphere reserve, Vietnam	0325
Domination	
Convex domination in the composition and cartesian product of graphs	0409
Secure domination in a network: a protection strategy	0420
Dopant ions	
Effect of dopant ions on the electrical conductivity and microstructure of polyaniline (emeraldine salt)	0246
Doping	
Structure and mechanical property of MgO-ZrO2 ceramic doped with CeO2	0308
Dose tail	
A Monte Carlo simulation study on the interactions of proton, 7Li and 12C with water for hadron therapy application	0549
Double-blind,	
Clinical trial of Vitex negundo tablet as antitussive	0442
Double-stranded	
Elastic properties of a biopolymer	0165
Dragoflies	
An annotated checklist of the dragonflies of Cebu Island, the Philippines with notes on conservation	0607
Dragon fruit	
State university developes dragon fruit products	0111
Dragonfly	

Morphological differences in the shapes and venation of wings of selected dragonfly species	0200
Drepanostica sugbo	
An annotated checklist of the dragonflies of Cebu Island, the Philippines with notes on conservation	0607
Dried banana leaf spider	
A new species of dried banana leaf spider, <i>Neobrettus</i> wanless 1984 (Araneae: Salticidae) from the agricultural lowlands of Mt. Banahaw, Quezon Province, Philippines	0078
Drinking water	
Occurrence and determination of Haloacetic Acids in Metro Manila drinking water	0267
Drug delivery	
Glycerol-crosslinked polyacrylic acid hydrogels	0260
Drug sequestration	
Fabrication of chitosan micron and submicron particles for drug sequestration	0255
Drum seeder	
Save much on seeding with the improved drum seeder	0108
Drying	
Development and production of Mt. Pinatubo ash artwares	0313
Drying capacity	
Optimization of batch recirculating dryer performance	0082
Drying efficiency	
Optimization of batch recirculating dryer performance	0082
dsDNA	
Stretching single molecular DNA by temperature gradient: a white noise functional approach	0570
Dual inoculation	
Co-inoculation of mungbean with rhizobia and plant growth promoting rhizobacteria (PGPR) improves nodulation, dry matter yield and nitrogen uptake	0016
Duck	
The Philippine duck industry: issues and policy directions	0089
Duck eggs	
The Philippine duck industry: issues and policy directions	0089
Duck meat	
The Philippine duck industry: issues and policy directions	0089
Duplicate gene action	
Mapping of the <i>Rf</i> gene of a cytoplasmic male sterile line of rice ( <i>Oryza sativa</i> L.) developed from a mutagenized source	0069

Durability	
Coconut fiber reinforced composite new technology approach to age-old solutions	0587
Dwarfism	
Nutrition problems of the urban family	0492
Dynamics	
Onset of small-world behavior in topologically evolving networks	0558
Dyspepsia	
The effect of banana fruit ( <i>Musa sapientum</i> ) as adjunct to ranitidine in the management of uninvestigated dyspepsia	0460
Pranic healing as adjunct treatment in functional dyspepsia	0499
Dysprosium	
Synthesis and characterization of $A1^{+3}$ doped $R_3Fe_{5-x}A1_xO_{12}$ (R=Dy and Y) iron garnets	0574
e-cloth	
Electroconductive polythiophene/polyester composite as e-cloth	0249
Early intervention	
Batangas health E-center	0282
Earthworms	
Studies on the production and utilization of vermicompost produced with the African Nightcrawler ( <i>Eudrilus eugeniae</i> ) in the Philippines	0228
Eastern himalaya	
Plant species diversity and endemism at dihang dibang biosphere reserve and its surroundings, eastern himalaya biodiversity hotspot	0213
Ecology	
Assessment on the estuarine areas of Camotes Islands, Central Philippines: their ecology and prospects for milkfish (Chanos chanos) and prawn (Penaeus monodon) industry	0327
Some butterflies of Boracay Island	0278
Philippine biodiversity: ecological roles, uses, and conservation status	0279
Translocation of the Clupeid <i>Sardinella tawilis</i> to another lake in the Philippines: a proposal and ecological considerations	0231
Economic status	
Women in the December 26 tsunami: how have they coped; how can we help?	0404
Economics of coconut fertilization	
Coconut yield and profitability under two practical fertilizer options: common salt (sodium chloride) and multi-nutrient 14N-5P2O5-20K2O- 15CI-4.5S-0.02B applications on bearing trees (technology notes)	0014

Economy

Eco-stairs	0288
Ecosystem	
Ecosystem-based approach to aquaculture management	0382
Ecstasy	
Analysis of ecstasy in human urine by high performance liquid chromatography	0433
Analysis of ecstasy in urine using gas chromatography with mass spectrometry	0240
Edible forest plants	
Use of edible forest plants among indigenous ethnic minorities in cat tien biosphere reserve, Vietnam	0325
EDTA	
Kinetics of iron in the development of rapid screening technique for iron toxicity tolerance in rice	0066
Education	
The rural women entrepreneurs: their business profiles, entrepreneurial behaviors, management styles, problems and prospects	0280
Efficiency	
The efficiency and social acceptability of the constructed wetland of Bayawan City, Negros Oriental	0316
Heat pump drying of onion (Allium cepa)	0056
Einstein gas	
Study of the perturbation to a bose-einstein gas	0571
Elastic force	
The effect of adhesion force on cell elastic modulus	0524
Elastic-plastic	
Elastic-plastic analysis of underground openings by the finite element method	0292
Elasticity	
Elastic properties of a biopolymer	0165
Elastomeric adhesive	
Effects of applied voltage on the mean diameter of electrospun polyaniline (PANI)- elastomeric adhesive fiber	0589
Elderly	
Physical activity, energy requirements and adequacy of dietary macro- and micronutrient intakes of older persons in a rural Filipino community	0374
Electrical conductivity	
Effect of dopant ions on the electrical conductivity and microstructure of polyaniline (emeraldine salt)	0246
Electrocatalysis	
Conductive polymers as host matrices for the dispersion of gold nanoparticles with	0244

electrocatalytic properties

Electrocatalyst	
Fabrication of electrocatalyst based on PEDOT-PSS supported Pd nanoparticles for ethanol electro-oxidation	0256
Electromagnetic pulses	
THz radiation from high-Tc superconducting materials and its applications	0582
Electronic nose	
Chemiresistor electronic nose based on graphite composite for the detection of volatile organic compounds	0243
Electropolymerization	
Conductive polymers as host matrices for the dispersion of gold nanoparticles with electrocatalytic properties	0244
Preparation and photoelectrochemical characterization of polyaniline doped with copper phthalocyanine tetrasulfonate	0269
Electrospinning	
Effects of applied voltage on the mean diameter of electrospun polyaniline (PANI)- elastomeric adhesive fiber	0589
ELISA	
Antibody titer response of cattle (Bos taurus) vaccinated with oil and aluminum adjuvanted FMD vaccine (Serotype $O_2$ , $A_{24}$ and $C_3$ )	0005
Transgenic rice plants overexpressing host transcription factors Rf2A and Rf2B are tolerant to tungro disease	0122
ELISA Kit	
Effects of age and needle length on the seroconversion and herd immunity of a commercial trivalent ( $O_1$ , $A_{24}$ , $C_3$ ) oil-based FMD vaccine	0041
ELISA test	
Diagnosis and control of porcine epidemic diarrhea: case report	0034
Embryo	
Sex preselection in animals: current methods and applications	0507
Embryogenesis	
Diabetes and childbearing: exploring the options	0458
Embryonic development	
Improving human fetal development: the super baby	0477
Emeraldine film	
Spectrophotometric analysis of $\alpha$ -tocopherol using emeraldine film	0272
Emeraldine salt	
Effect of dopant ions on the electrical conductivity and microstructure of polyaniline (emeraldine salt)	0246

Emissions

Greenhouse gas emissions of tobacco flue-curing process in the Philippines	0295
Empirical orthogonal function	
Wind stress curl and surface circulation in the South China Sea and the Philippine Sea	0403
Encircling net (takilis)	
Stock assessment of commercially important fishes in Naujan Lake	0399
Endangered speCles	
Assessment of fish fauna in Lake Lanao	0136
Endangered species	
Philippine biodiversity: ecological roles, uses, and conservation status	0279
Endemic cyprinids	
Lake Lanao: its past and present status	0385
Endemic fish species	
Assessment of fish fauna in Lake Lanao	0136
Endemic species	
Floristic inventory of the Luneta Park, Manila	0170
Endemic threatened species	
The avifauna of Mt. Haponhaponon, Mantikil, Siaton, Negros Oriental: with notes on other vertebrates	0312
Endemism	
Philippine biodiversity: ecological roles, uses, and conservation status	0279
Plant species diversity and endemism at dihang dibang biosphere reserve and its surroundings, eastern himalaya biodiversity hotspot	0213
Endocarp	
The fruit anatomy of <i>Moringa oleifera</i> Lam: a potential plant for healthy active ageing	0175
Endoglucanase	
Bacillus subtilis 168 endoglucanase binds to chemical soils under diverse conditions	0138
Endoglucanse	
Site-directed mutagenesis identifies putative soil-binding residues of <i>Bacillus subtilis</i> 168 endoglucanase	0226
Energy	
Eco-stairs	0288
Greenhouse gas emissions of tobacco flue-curing process in the Philippines	0295
Energy expenditure	
Physical activity, energy requirements and adequacy of dietary macro- and micronutrient intakes of older persons in a rural Filipino community	0374

Energy planning A bi-level multi-period optimization model for multiple feedstock bioenergy supply 0283 chains **Energy** requirements 0374 Physical activity, energy requirements and adequacy of dietary macro- and micronutrient intakes of older persons in a rural Filipino community Engineering Assessment of renewable energy resource potential and application for 0281 decentralized rural electrification using geographic information system (GIS) Batangas health E-center 0282 A bi-level multi-period optimization model for multiple feedstock bioenergy supply 0283 chains Characteristics of Pangasinan zeolite as a molecular sieve for bioethanol 0284 Design and development of smart karwats: a GSM based car security system with 0285 GPS tracking capability Development of electronically controlled environment for the fast decomposition of 0286 organic fertilizer Development of feature set, classification implementation and applications for 0287 vowel migration/modification in Sung Filipino (Tagalog) texts and perceived intelligibility **Eco-stairs** 0288 The effect of deposition time on textured magnesium diboride thick films fabricated 0289 by electrophoretic deposition Effects of antioxidant extracted from leaves of "banaba" (Lagerstroemia speciosa, 0290 L.), mangosteen (Garcinia mangostana, L.) and "tsaang gubat" (Ehretia *microphylla L.*) on the oxidation stability of biodiesel Effects of noise coherence on stochastic resonance enhancement in a bithreshold 0291 system Elastic-plastic analysis of underground openings by the finite element method 0292 Ethanol fermentation under vacuum pressure 0293 Fabrication and characterization of spin-assisted and dip-coated PEDOT:PSS and 0294 poly(diallydimethylammonium chloride) nanofilms for organic light-emitting diode Greenhouse gas emissions of tobacco flue-curing process in the Philippines 0295 Investigation of arsenate uptake by hydrotalcite at hyperalkaline and elevated 0296 temperature conditions Microbial fuel cell: a new renewable source of energy: Pasig river sediments for 0297 lighting 0298 Nanowire formation and polymer conformations of electropolymerized poly(3,4,ethylenedioxythiophene) (PEDOT) on iodine-modified Au(111) single crystal electrode as probed by in-situ STM

Optimization of <i>Jathropha curcas</i> (tubang bakod) and <i>Calophyllum inophyllum</i> (bitaog) as a viable source of activated carbon for methylene blue adsorption	0299
Physical quality characterization of milled rice using computer vision technique	0300
Preliminary investigation of <i>Calophyllum inophyllum</i> (Bitaog) as a potential source of biofuel	0301
Preparation and investigation of spin self assembled multilayer film of poly(3,4 ethylenedioxythiophene): poly(4 styrenesulfonate) and poly(alylamine hydrochloride) as organic light-emitting diode	0302
Reducing fossil fuel emission using treadle pump technology	0303
The reduction Behavior of nickel in high-iron laterites under $CO/CO_2/N_2$ atmospheres	0304
A research on the production of bonded particle board utilizing sugarcane bagasse	0305
Rice husk ash as soil stabilizer	0306
Speech recognition controller for motorized wheelchair	0307
Structure and mechanical property of MgO-ZrO2 ceramic doped with CeO2	0308
Surface molecular aggregation states of monodisperse and polydisperse polystyrene films on scanning force microscope	0309
Synthesis and characterization of cordierite prepared from mixtures of Philippine Kaolinite Clay, Talc, and other additives	0310
A tilt, soil moisture, and pore water pressure sensor system for slope monitoring applications	0311
Enhancing antibodies	
Growth patterns and infectivity of a dengue-2 virus strain propagated in the human myelomomocytic cell line K562	0471
Enrichment of the brain	
Improving human fetal development: the super baby	0477
Entada parvifolia	
Studies on Schistosomiasis japonica and Saponins	0509
Entada phaseoloides	
Studies on Schistosomiasis japonica and Saponins	0509
Enterobacteriaceae	
Multidrug-resistant esbls in common clinical isolates: first documentation of BLACTX-M genotype in the Philippines	0488
Entomopathogenic fungi	
Development and incidence of <i>Neozygites fresenii</i> (Nowakowski) remaudiere & Keller (Zygomycetes: Entomophthorales) in aphis craccivora koch and its pathogenicity to three other aphididae (Hemiptera)	0029
Two <i>Neozygites</i> species (Zygomycetes: Entomophthorales) infecting aphids and mealybugs on Leyte Island	0076

Entomophthorales

-		
Developme Keller (Zy pathogenic	ent and incidence of <i>Neozygites fresenii</i> (Nowakowski) remaudiere & gomycetes: Entomophthorales) in aphis craccivora koch and its ity to three other aphididae (Hemiptera)	0029
Two <i>Neozy</i> mealybugs	<i>vgites</i> species (Zygomycetes: Entomophthorales) infecting aphids and on Leyte Island	0076
Environment		
Towards su	ustainable aquaculture in the Philippines	0340
Environment	al isotopes tritium	
Environme Lake and t	ental isotope techniques in the lake-aquifer interaction between Laguna he aquifer in the south sector of Metro Manila	0317
Environment	al science	
The avifau on other ve	na of Mt. Haponhaponon, Mantikil, Siaton, Negros Oriental: with notes ertebrates	0312
Developme	ent and production of Mt. Pinatubo ash artwares	0313
Diversity a Philippines	and status of plants in three mountain ecosystems in Southern Mindanao,	0314
Effect of the Manila on	ne diurnal variation of the convective boundary layer height over Metro pollutant concentration	0315
The efficie Negros Or	ency and social acceptability of the constructed wetland of Bayawan City, iental	0316
Environme Lake and t	ental isotope techniques in the lake-aquifer interaction between Laguna he aquifer in the south sector of Metro Manila	0317
Will mang	rove reforestation provide net benefits: a case in Sibunag, Guimaras	0318
A model si	mulation of air pollution over Metro Manila	0319
Socio-ecor and vicinit	nomic conditions and perceptions on the conservation of Tubbataha Reefs y: a households survey in Cagayancillo, Palawan	0320
Species ac Philippines	count of marine diatoms of the genus <i>Pseudo-nitzschia</i> in San Pedro Bay,	0321
Spill-over	effects of rural industrialization on community transformation	0322
State of ma Palawan	angroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City,	0323
Subsequen phosphoru selected ar	t effects of intraruminal soluble glass bolus on plasma calcium, s and magnesium content of grazing does under backyard conditions in eas in Nueva Ecija, Philippines	0324
Use of edil reserve, Vi	ble forest plants among indigenous ethnic minorities in cat tien biosphere etnam	0325
Enzyme 5-lip	boxygenBse	
Studies on celastracea	the outer root bark of <i>Kokoona ochracea</i> (ELM) Merr. (family e)	0510

Epidemiology	
Coronary-cameral fistula: a case report	0451
Epistaxis	
Dengue fever profile in the province of South Cotabato	0456
Equilibrium	
Elastic-plastic analysis of underground openings by the finite element method	0292
Erythrocyte hemolysis	
Studies on the outer root bark of <i>Kokoona ochracea</i> (ELM) Merr. (family celastraceae)	0510
Escherichia coli	
Essential oil content and antibacterial activity of some Philippine plants	0251
Lemon grass (Cymbopogon citratus)extract: a promising antibacterial juice	0189
Essential oil	
Essential oil content and chemical composition of Philippine <i>Cinnamomum mercadoi</i> vidal (Lauraceae)	0252
Essential oil content and chemical composition of Philippine Zingiber officinale Rosc.	0253
Estuarine areas	
Assessment on the estuarine areas of Camotes Islands, Central Philippines: their ecology and prospects for milkfish (Chanos chanos) and prawn (Penaeus monodon) industry	0327
Etching	
Surface modified zinc oxide: a potential smoke sensor at ambient condition	0572
Ethanol	
The effect of deposition time on textured magnesium diboride thick films fabricated by electrophoretic deposition	0289
Improving quality and shelf-life of vegetables and fruits by evaporative cooling storage	0058
Ethanol fermentation	
Ethanol fermentation under vacuum pressure	0293
Ethanol yield	
Yield potential of rain tree fruit (Samanea saman Merr.) as feedstock for biofuel production	0600
Ethnic in nature	
Women in health development: the Mangyans of Mindoro Province	0512
Ethoxybenzene	
Morphology-controlled polyacetylene films synthesized in liquid crystalline solvents	0265

Etiology

Coronary-cameral fistula: a case report	0451
Eucalyptus camaldulensis	
Field growth responses of three tree species to mycorrhiza and fertilizers in the bioremediation of a mine waste dump	0351
Eucheuma Kappaphycus	
Technological improvements in commercial <i>Eucheuma</i> cultivation: a short communication	0402
Euclidean space	
Unit graphs: dimension and span	0431
Eudrilus eugeniae	
Studies on the production and utilization of vermicompost produced with the African Nightcrawler ( <i>Eudrilus eugeniae</i> ) in the Philippines	0228
Eugenol	
The antiseptic activity of Psidium guajava essential oil	0133
Euler-poisson system	
Incompressible limit of the compressible euler-poisson system for general initial data	0417
Euphorbiaceous	
Identification of ribosome-inactivating protein (RIP) in selected plants for medicinal plant properties screening	0183
Eusocial ants	
Mandibular shape variation in the ants <i>Diacamma rugosum</i> and <i>Pheidologeton</i> diversus philippinus	0193
Eutrophication	
A modelling of eutrophication in Laguna de Bay as a tool for rational resource management	0388
Evaporative cooling	
Improving quality and shelf-life of vegetables and fruits by evaporative cooling storage	0058
Event driven code	
Numerical investigation of non-homologous collapse of the one-dimensional gravitational gas	0555
Evidence-based medicine	
Impact of internet use on medical practice of FM residents and consultants in Davao City	0475
Ex vitro establishment	
Tissue cultured avocado ( <i>Persea americana</i> MILLER): a journey from laboratory to field	0121

Exacerbates symptoms

Cross-sectional study of the alcohol use among elderly patients seen in the Veterans Memorial Medical Center Medical Out-Patient Clinic using alcohol screening aid of the National Institute on Alcohol Abuse and Alcoholism	0452
Exclusions	
Resolving questioned paternity issues using a Philippine genetic database	0504
Existing car alarm system	
Design and development of smart karwats: a GSM based car security system with GPS tracking capability	0285
Exocarp	
The fruit anatomy of <i>Moringa oleifera</i> Lam: a potential plant for healthy active ageing	0175
Exotic palms	
Invasion of the buff coconut mealybug ( <i>Nipaecoccus nipae</i> ) in U.P. Los Baños campus, elucidation of the confounded "mealybug burn" damage and practical control	0065
Extended spectrum beta-lactamases	
Occurrence of SHV and TEM genes in phenotipically screened-positive extended spectrum β-lactamases (ESBLS) producing organisms isolates from selected tertiary hospitals (2008)	0206
Extended-spectrum  ß-Lactamase (ESBL)	
Multidrug-resistant esbls in common clinical isolates: first documentation of BLACTX-M genotype in the Philippines	0488
Extension support system	
Comparative analysis of coffee farming practices introduced by government and the private sectors in Paksong District, Champasak Province, Lao PDR	0017
External beam therapy	
Clinical techniques for brachytherapy of head and neck tumors	0441
F. oxysporum	
Banana root endophytes: potential biocontrol agents for vascular wilt disease	0139
F1	
Seed quality response to fungicide treatment of a line and F <sub>1</sub> hybrid seeds	0109
Fabaceae	
Foliar anatomy of jade vine <i>Strongylodon macrobotrys</i> A. Gray (fabaceae): implications of ground and vascular tissue organization to growth and development	0171
Fabric stain remover	
Evaluation of the effectiveness of fabric stain removers	0591
Fabry-Perot resonator	
Optical-feedback semiconductor laser Michelson interferometer	0561

Faced screw	
A research on the production of bonded particle board utilizing sugarcane bagasse	0305
Family APGAR	
The relation of family function and adherence to tuberculosis treatment	0503
Family planning methods	
Basic health services and population growth	0436
Farm profitability	
Profitability of Coconut production: an analysis of farm size, rental, cost, inorganic fertilization, and copra price during a five-year cropping cycle period (technology notes)	0095
Farm rental schemes	
Profitability of Coconut production: an analysis of farm size, rental, cost, inorganic fertilization, and copra price during a five-year cropping cycle period (technology notes)	0095
Farmer education	
Comparative analysis of coffee farming practices introduced by government and the private sectors in Paksong District, Champasak Province, Lao PDR	0017
Farming practices	
Organic rice farming in Northeastern Thailand: an assessment of farmers' practices	0084
Farming systems	
Technological improvements in commercial <i>Eucheuma</i> cultivation: a short communication	0402
Fascia	
The role of radiation in tissue banking	0506
Fatty Acid Methyl Ester (FAME)	
Preliminary investigation of <i>Calophyllum inophyllum</i> (Bitaog) as a potential source of biofuel	0301
Faunal checklist	
A checklist and host index of Philippine mites (acari) associated with arthropods	0609
Fe layer	
Enhancement of Fe magnetic moments in Fe/Co (001) multilayers	0530
Fe/Co (001) multilayers	
Enhancement of Fe magnetic moments in Fe/Co (001) multilayers	0530
Fecundity	
The fecundity and fertility of field collected and corn stalk collected asian corn borer, <i>Ostrinia furnacalis</i> Guenee	0050
Population structure and reproductive biology of <i>Siganus fuscescens</i> Houttuyn 1782 (Perciformes, Siganidae) in Pujada Bay, Southeastern Mindanao, Philippines	0214

Feed supplement

**	
The utilization of azolla in the Philippines: biological problems and solutions	0124
Feeding experiments	
Exclusion of <i>Planococcus lilacinus</i> (cockerell) from the list of Philippine bamboo pests based on field and laboratory studies	0045
Feeding habits	
Food and feeding habits of Synodontis nigrita from the Osun River, SW Nigeria	0172
Feeding management	
Emerging swine production technologies to keep pace with increasing population	0044
Feeding rates	
Survivorship and growth performance of red spiny lobster <i>Panulirus longipes longipes</i> reared in floating netcages fed with <i>Sardinella</i> spp at different feeding rates	0338
Femtosecond pulse propagation	
Femtosecond pulse propagation in a highly nonlinear photonic crystal fiber	0532
Fermentation	
Yield potential of rain tree fruit (Samanea saman Merr.) as feedstock for biofuel production	0600
Ferrous sulfate	
Comparative effectiveness of an iron-fortified product with the sangkap pinoy seal and ferrous sulfate on the hemoglobin and hematocrit levels of five year old pre- school children at the Eskwelahang Munti Barangay Potrero, Malabon City	0446
Fertility	
Basic health services and population growth	0436
The economic impact of the demographic crisis: its implications on public policy	0601
The fecundity and fertility of field collected and corn stalk collected asian corn borer, <i>Ostrinia furnacalis</i> Guenee	0050
Fertility restorer	
Mapping of the <i>Rf</i> gene of a cytoplasmic male sterile line of rice ( <i>Oryza sativa</i> L.) developed from a mutagenized source	0069
Fertilizer application	
Influence of boron-potassium fertilizer application on the occurrence of cracking in carrots ( <i>Daucus carrota</i> Linn)	0063
Fertilizers	
Field growth responses of three tree species to mycorrhiza and fertilizers in the bioremediation of a mine waste dump	0351
Organic matter residue management for the improvement of soil quality in lowland rice systems	0083
Fetal development	

Improving human fetal development: the super baby	0477
Fetus	
Improving human fetal development: the super baby	0477
Fiber optic	
Device fabrication of 60 µm resonant cavity light-emitting diode	0520
Ficus	
Utilizing balete for riverbank protection and watershed rehabilitation	0125
Field collected	
The fecundity and fertility of field collected and corn stalk collected asian corn borer, <i>Ostrinia furnacalis</i> Guenee	0050
Filariasis	
A family health care model for the implementation of mass annual treatment with diethylcarbamazine citrate for the elimination of filariasis in the Philippines	0468
Filipino	
Development of feature set, classification implementation and applications for vowel migration/modification in Sung Filipino (Tagalog) texts and perceived intelligibility	0287
Filipino homes	
National indoor radon survey in Filipino homes	0551
Filipinos	
Predictors of poor compliance to medications among adult Filipino patients diagnosed with hypertension in selected provinces of the Philippines	0500
Filters	
Effect of filter arrangement in the estimation accuracy of an imaging spectrometer	0526
Financial assets	
Spill-over effects of rural industrialization on community transformation	0322
Fingerprinting	
Genetic diversity analysis of Philippine maize inbred lines using microsatellite markers	0053
Fish cage	
Assessment of local government's implementation of open access policy in Taal Lake, Philippines: effects on lake conservation and management	0326
Fish corral (baklad)	
Stock assessment of commercially important fishes in Naujan Lake	0399
Fish fauna	
Assessment of fish fauna in Lake Lanao	0136
Fish freshness	
Fish freshness analysis using a polyaniline/nylon composite-based chemiresistor	0343
sensor

Fish pot (bubo)	
Stock assessment of commercially important fishes in Naujan Lake	0399
Fish production	
Lake Lanao: its past and present status	0385
Fish recruitment	
Deriving recruitment and spawning patterns from a survey of juvenile grouper (Pisces: Serranidae) occurrences in the Philippines	0328
Fish stock assessment	
Sustainable development of Philippine Lake Resources: an agenda for research and development	0401
Fish trap (patanga)	
Stock assessment of commercially important fishes in Naujan Lake	0399
Fisher folk	
Assessment of local government's implementation of open access policy in Taal Lake, Philippines: effects on lake conservation and management	0326
Fisheries	
Assessment of local government's implementation of open access policy in Taal Lake, Philippines: effects on lake conservation and management	0326
Assessment on the estuarine areas of Camotes Islands, Central Philippines: their ecology and prospects for milkfish (Chanos chanos) and prawn (Penaeus monodon) industry	0327
Deriving recruitment and spawning patterns from a survey of juvenile grouper (Pisces: Serranidae) occurrences in the Philippines	0328
Fish culture in cages in Lake Danao, Cebu	0329
Genetic diversity in wild stocks of the giant freshwater prawn ( <i>Macrobrachium rosenbergii</i> ): implications for aquaculture and conservation	0330
Influence of music on the growth of koi carp, Cyprinus carpio (Pisces:Cyprindae)	0331
Padal fishing: a unique fishing method in the Ashtamudi estuary of Kerala (South India)	0332
Salinity tolerance of freshwater catfish ( <i>Clarias batrachus</i> Linnaeus and <i>Clarias macrocephalus</i> Gunther) in aquaria in the laboratory of CSCST-Fishery and Industrial College, San Francisco, Cebu	0333
Save Ludong, the most delicious and expensive fish in Republic of the Philippines	0334
Sedimentation rate in fringing reefs of Honda Bay, Puerto Princesa City, Palawan, Philippines with reference to coral reef condition	0335
Spawning and hatching performance of the silvery black porgy <i>Sparidentex hasta</i> under hypersaline conditions	0336
The status of tilapia aquaculture in Lake Sebu, South Cotabato	0337

Su <i>loi</i> rat	arvivorship and growth performance of red spiny lobster <i>Panulirus longipes</i> <i>ngipes</i> reared in floating netcages fed with <i>Sardinella</i> spp at different feeding tes	0338
Su	istainable marine fisheries production in the Philippines	0339
Тс	owards sustainable aquaculture in the Philippines	0340
Us (P	se of enriched live prey in promoting growth and maturation of tiger shrimp <i>Penaeus monodon</i> )	0341
Fish	eries resources	
La	ake Lanao: its past and present status	0385
Su de	istainable development of Philippine Lake Resources: an agenda for research and evelopment	0401
Fish	ery	
Pc (P	opulation structure and reproductive biology of <i>Siganus fuscescens</i> Houttuyn 1782 erciformes, Siganidae) in Pujada Bay, Southeastern Mindanao, Philippines	0214
Fish	ing technologies	
Su	istainable marine fisheries production in the Philippines	0339
Fissi	ion products	
Dl	BA_DOSE: a PC program for stack design and the PRR-1 design basis accident	0360
Flex	ural strength	
А	research on the production of bonded particle board utilizing sugarcane bagasse	0305
Fligl	ht parameters	
W Co	ing ecomorphology and flight performance of bats in Pisan Cave, Kabacan, North otabato, Philippines	0235
Floo	d	
Re ca	elative sea level changes and worsening floods in the Western Pampanga Delta: uses and some possible mitigation measures	0366
Flora	al diversity	
Pr	eliminary survey of mangrooves and pine forest of Masinloc, Zambales	0353
Flori	istic inventory	
Fl	oristic inventory of the Luneta Park, Manila	0170
Flow	v-cytometry	
Se	ex preselection in animals: current methods and applications	0507
Flue	-curing	
Gı	reenhouse gas emissions of tobacco flue-curing process in the Philippines	0295
Flux	creep	
Fl	ux Creep Investigation in $Bi_2Sr_2CaCu_2O_{8+\delta}$ high-temperature superconductor	0533
Flux	motion	
Fl	ux Creep Investigation in $Bi_2Sr_2CaCu_2O_{8+\delta}$ high-temperature superconductor	0533

Fly ash scrubber to control emission of fly ash particulates	
Development of Philmech rice hull-fed furnace system for heating mechanical dryers	0033
FM residents	
Impact of internet use on medical practice of FM residents and consultants in Davao City	0475
FMD control program	
Exploring the use of theater as an intervention tool for FMD control	0046
FMD information management system	
FMD information management system as a disease surveillance tool in FMD control and eradication program in the Philippines	0052
Focal species	
Focal benthic mollusks (Mollusca: Bivalvia and Gastropoda) of selected sites in Tubbataha Reef National Marine Park, Palawan, Philippines	0384
Foliage insect diversity	
Effects of forest gaps on foliage insect diversity in the perment field laboratory areas (PFLAS)in Mt. Makiling Forest Reserve	0350
Foliar anatomy	
Foliar anatomy of jade vine <i>Strongylodon macrobotrys</i> A. Gray (fabaceae): implications of ground and vascular tissue organization to growth and development	0171
Food efficiency ratio	
The effect of dietary oil on the growth and intellectual capacity of mice	0245
Food habits	
Food and feeding habits of Synodontis nigrita from the Osun River, SW Nigeria	0172
Food irradiation	
The international and local scene in food irradiation and its relevance to future directions for food irradiation in the Philippines	0064
Nuclear science and technology: perspectives and prospects for Philippine development	0554
Food products	
Microbial load assessment of some "one town one product (otap)" food products of Ilocos Norte	0196
Food science and technology	
Determination of <i>Trans</i> fatty acid in virgin coconut oil and other fats and oils by gas chromatography	0342
Fish freshness analysis using a polyaniline/nylon composite-based chemiresistor sensor	0343
Method validation for the determination of iodine in urine by ammonium persulfate digestion with spectrophotometric detection of the Sandell-Kolthoff reaction	0344

Method validation of plasma or serum retinol analysis using high performance liquid chromatography UV/VIS detection	0345
Quick-cooking rice processes for Philippine rice cultivars	0346
Radioisotopes as tools in food and nutrition research	0347
Standardization of thermal processes for local foods with emphasis on low-acid foods	0348
Food security	
Towards sustainable aquaculture in the Philippines	0340
Food supply	
The international and local scene in food irradiation and its relevance to future directions for food irradiation in the Philippines	0064
Foodstuff contamination	
Sensitivity of radiation monitoring systems in Manila Ports in detecting contamination in foodstuff shipments	0567
Foot-and-mouth disease (FMD)	
Antibody titer response of cattle (Bos taurus) vaccinated with oil and aluminum adjuvanted FMD vaccine (Serotype $O_2$ , $A_{24}$ and $C_3$ )	0005
The economic impact of FMD and its control in the Philippines	0039
Effects of age and needle length on the seroconversion and herd immunity of a commercial trivalent ( $O_1$ , $A_{24}$ , $C_3$ ) oil-based FMD vaccine	0041
FMD information management system as a disease surveillance tool in FMD control and eradication program in the Philippines	0052
Footbridge	
Eco-stairs	0288
Force-indentation curve	
The effect of adhesion force on cell elastic modulus	0524
Forest degradation	
Google earth: a tool for eliciting spatial information about forest degradation from local people	0592
Forest gaps	
Effects of forest gaps on foliage insect diversity in the perment field laboratory areas (PFLAS)in Mt. Makiling Forest Reserve	0350
Forest management system	
Muyong: an indigenous sustainable forest management system	0075
Forestry	
Carbon storage and sequestration potential of upland and mangrove forest ecosystem in Binahaan Watershed and Padre Burgos Quezon	0349
Effects of forest gaps on foliage insect diversity in the perment field laboratory areas (PFLAS)in Mt. Makiling Forest Reserve	0350

Field growth responses of three tree species to mycorrhiza and fertilizers in the bioremediation of a mine waste dump	0351
Improving the environment and living conditions of the rural poor: potential of reforestation CDM in the mangrove communities of San Juan Batangas	0352
Preliminary survey of mangrooves and pine forest of Masinloc, Zambales	0353
Silvical characteristics of pure and mixed stands in permanent field laboratory area (PFLA 3), Mt. Makiling Forest Reserve	0354
Strength and related properties of bagras ( <i>Eucalyptus deglupta</i> Blume) and gubas ( <i>Endospermum peltatum</i> Merr.) in comparison with some tree plantation species in the Philippines	0355
Survey of trees using ArcGIS offset line and digicam tree measurement techniques	0356
Formic acid	
Electrochemical synthesis and characterization of poly(3,4- ethylenedioxythiophene)-supported Pd-Sn nanoparticles dispersed on Au electrode for formic acid oxidation	0248
Formicidae	
A new genus, two new species and a new subspecies of Philippine Ants (Hymenoptera: Formicidae)	0203
FORTRAN-77	
PUF_DOSE: a PC program to calculate doses from a puff release of radioactivity	0365
Fossil fuel emission	
Reducing fossil fuel emission using treadle pump technology	0303
Fourier transform method (FTM)	
Measurement of three-dimensional deformations by phase-shifting digital holographic interferometry	0547
Fourth finger technique	
Comparative study on the use of fourth finger technique versus standard technique of intradermal injection of anti-rabies vaccine	0449
Fractal	
On the hausdorff dimension of sierpinski carpets	0426
Fractional calculus	
Fractional calculus and their applications	0416
Freely jointed chain	
Elastic properties of a biopolymer	0165
Frequency conversion.	
Frequency conversion of the 355 nm Nd:YAG laser via stimulated raman scattering in hydrogen	0534
Frequency modulated-continuous wave (FM-CW)	
Simultaneous ground-based observations of electric and magnetic field variation	0568

near the magnetic equator for space weather study

Freshwater prawn

Genetic diversity in wild stocks of the giant freshwater prawn (*Macrobrachium* 0330 *rosenbergii*): implications for aquaculture and conservation

## Freshwater site

Environmental and production survey methodology to estimate severity and extent 0383 of aquaculture impact in three areas of the Philippines

A model to estimate aquaculture carrying capacity in three areas of the Philippines 0387

Recommendations for practical measures to mitigate the impact of aquaculture on 0393 the environment in three areas of the Philippines

Freshwater zooplankton,

Zooplankton spatial abundance and distribution in the West Bay of Laguna de Bay 0237 (Philippines) with notes on potential implications to food and health security

Fruit crop improvement

Tissue cultured avocado (*Persea americana* MILLER): a journey from laboratory to 0121 field

Fruits

Improving quality and shelf-life of vegetables and fruits by evaporative cooling 0058 storage

Fruticose lichens

Fruticose lichens from selected sites in Luzon as sources of biologically active 0176 lichen acids

FTA â,,¢ classic card

Evaluation and in-house validation of five DNA extraction methods for PCR-based 0467 STR analysis of bloodstained denims

Fuchsin

Ion chromatographic method with post-column fuchsin reaction for measurement of 0262 bromate in chlorinated water

Fuel cell

Fabrication of electrocatalyst based on PEDOT-PSS supported Pd nanoparticles for 0256 ethanol electro-oxidation

Fuelwood

Greenhouse gas emissions of tobacco flue-curing process in the Philippines	0295
Fungal endophytes	
Banana root endophytes: potential biocontrol agents for vascular wilt disease	0139
Fungal growth	
Seed quality response to fungicide treatment of a line and F <sub>1</sub> hybrid seeds	0109

Fusarium disease

Management of banana *Fusarium* disease 0068

GaAs

Device fabrication of 60 µm resonant cavity light-emitting diode	0520
Electron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Off-axis substrates	0529
Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular beam epitaxy	0536
Localization and imaging of integrated circuit defect using simple optical feedback detection	0544
GaAs/A1GaAs	
Observation of the quantum-confined stark effect in a GaAs/A1GaAs P-I-N Diode by room temperature photocurrent spectroscopy	0556
Gabbroic	
Zambales ophiolite complex mafic dikes in upper mantle rock suites: distinct short- lived island arc magmatisms	0367
Galactomannan	
Galactomannan from Makapuno: another amazing coconut product	0376
Gallium nitride	
Thin film formation of gallium nitride using plasma-sputter deposition technique	0581
Gamma irradiation	
PNRI mutant variety: Cordyline 'Afable'	0091
Gamma radiation	
Effects of gamma radiation on the testicular cells of corn earworm [helicoverpa armigera (Hubner)]	0163
Gamma spectrometry	
Minimum detectable activity of a 5x5 NaI T1) gamma spectrometer used for the radioactivity clearance measurements of the PRR-1 decommissioning project	0364
Gamma sterilization	
Nuclear science and technology: perspectives and prospects for Philippine development	0554
Ganoderma lucidum	
Degradation of pyrene, fluorene and fluoranthene: the role of lignin peroxidase and manganese peroxidase from Ganoderma lucidum	0154
Wild genetic useful mushroom resources of Central Luzon, as sources of nutriceuticals	0127
Gari (Gabraeus) elongata (Lamarck 1818)	
Some aspects of the reproduction in the elongate sunset clam, <i>Gari elongata</i> (Lamarck 1818) from Banate Bay Area, West Central Philippines	0379
Garlic growing	
A descriptive model of cropping decision making application to crop diversification	0026

in irrigated rice farms

Gas chromatography

Determination of <i>Trans</i> fatty acid in virgin coconut oil and other fats and oils by gas chromatography	0342
Gas chromatography with mass spectrometry (GCMS)	
Analysis of ecstasy in urine using gas chromatography with mass spectrometry	0240
Gas composition	
The reduction Behavior of nickel in high-iron laterites under $CO/CO_2/N_2$ atmospheres	0304
Gas sensor	
Fish freshness analysis using a polyaniline/nylon composite-based chemiresistor sensor	0343
Gassmann equivalent subgroups	
Some characterizations of the direct product of gassmann triples	0406
Gassmann triple	
Some characterizations of the direct product of gassmann triples	0406
Gastropods	
Focal benthic mollusks (Mollusca: Bivalvia and Gastropoda) of selected sites in Tubbataha Reef National Marine Park, Palawan, Philippines	0384
GATE	
Dosimetry application of gate in prostate brachytherapy	0459
Gated spect	
The clinical utility of gated spect in myocardial perfusion imaging	0443
GC-mass spectra	
Hypoglycemic activity determination and characterization of potentially active metabolite(s) from the root crop <i>Smallantus sonchifolius</i> (yacon)	0372
GC-MS	
Essential oil content and chemical composition of Philippine Zingiber officinale Rosc.	0253
Ge islands	
Influence of stacked Ge islands on the dark current-voltage characteristics of a diode for solar cell application	0539
Gecko gecko	
Survey and census of ground lizards in the permanent field laboratory areas (PFLAS) in Mt. Makiling forest reserve	0230
Gemmula	
Evaluation of Philippine Gemmula: forms related to G speciosa and G kieneri	0167
Gene expression	

Histomorphometry and osteoinductive growth factor levels of fracture callus versus iliac crest bone grafts	0472
Gene overexpression	
Transgenic rice plants overexpressing host transcription factors Rf2A and Rf2B are tolerant to tungro disease	0122
General yield trial	
Development of improved varieties of mungbean (NSIC Mg14 and NSIC mg15)	0032
Generalization	
Learning capability of a silnple neural network	0543
Genes	
Identification of ribosome-inactivating protein (RIP) in selected plants for medicinal plant properties screening	0183
Genetic diversity	
Assessment of genetic diversity in <i>Tectona philippinensis</i> Benth. & Hook. f. (Verbenaceae) inferred from <i>TRNL</i> intron sequences	0137
Bioresource management and our common future	0146
Genetic diversity in wild stocks of the giant freshwater prawn ( <i>Macrobrachium rosenbergii</i> ): implications for aquaculture and conservation	0330
Genetic frequencies	
Frequency distribution of blood groups ABO, MN and Rh factor in Philippine cosmopolitan, regional, and the national populations	0174
Genetic improvement	
Emerging swine production technologies to keep pace with increasing population	0044
Genetic relatedness	
Ecology and genetic structure of giant clams around Savu Sea, East Nusa Tenggara Province, Indonesia	0160
Genetic structure	
Ecology and genetic structure of giant clams around Savu Sea, East Nusa Tenggara Province, Indonesia	0160
Genetic variability	
Genetic variability within the population of the vulnerable Mindanao endemic Blue- Capped Kingfisher ( <i>Actenoides hombroni</i> ) using polymorphic DNA markers	0178
Genotoxicity of dimethylnitrosamine,	
Mutagenicity, clastogenicity and antimutagenicity of expressions, decoctions, tablet and syrup preparations from "lagundi" ( <i>Vitex negundo</i> L.)	0490
Genotyping	
Single nucleotide polymorphism genotyping of antithrombotic therapy resistance markers using high resolution melt analysis	0508
Gentamicin	

Comparative treament of <i>Pseudomonas aeruginosa</i> burn wound infection using bacteriophage MB08 and antibiotics	0150
Geodetic cover	
The minimal closed geodetic numbers of graphs	0418
Geodetic number	
The minimal closed geodetic numbers of graphs	0418
Geographic variation	
Geographic variation in vegetative and flower morphometry among populations of <i>Lilium philippinense</i> Baker (liliaceae), an endemic species in the Philippines	0179
Geology	
AR_DOSE: a PC program for stack design and the PRR-1 41Ar effluent	0357
Basic design parameters for the new PRR-1 stack	0358
Compaction rates and paleo-sea levels along the delta complex north of Manila Bay, Luzon Island, Philippines	0359
DBA_DOSE: a PC program for stack design and the PRR-1 design basis accident	0360
The development of technetium - 99m radiopharmaceuticals: technetium -99m phytate	0361
The development of technetium - 99m radiopharmaceuticals: technetium -99m phytate	0362
Effects of lahar on the water quality of the rivers and tributaries of Pinatubo volcano	0363
Minimum detectable activity of a 5x5 NaI T1) gamma spectrometer used for the radioactivity clearance measurements of the PRR-1 decommissioning project	0364
PUF_DOSE: a PC program to calculate doses from a puff release of radioactivity	0365
Relative sea level changes and worsening floods in the Western Pampanga Delta: causes and some possible mitigation measures	0366
Zambales ophiolite complex mafic dikes in upper mantle rock suites: distinct short- lived island arc magmatisms	0367
Geomatic morphometrics	
Modularity and integration in the forewing of the Philippine rice black bug (Scotinophara SPP. stål, hemiptera: pentatomidae)	0197
Geometric morphometrics	
Relative warp analysis and correlation analysis based on distances to study morphological variations in the shell shape of <i>Pomacea canaliculata</i> (Lamarck) found in Iligan City	0222
Geriatric depression scale	
The prevalence of depression in the elderly at Area C, San Martin II, Sapang Palay, Del Monte Bulacan	0501
Germination	
An easy way to germinate sago palm seeds found	0038

Hull-imposed dormancy in rice	0057
Seed quality response to fungicide treatment of a line and F <sub>1</sub> hybrid seeds	0109
Giant clams	
Ecology and genetic structure of giant clams around Savu Sea, East Nusa Tenggara Province, Indonesia	0160
Gigantochloa levis	
Effects of fertilizer on shoot emergence of four bamboo species	0042
Gill net (pante)	
Stock assessment of commercially important fishes in Naujan Lake	0399
Ginger	
Essential oil content and chemical composition of Philippine Zingiber officinale Rosc.	0253
GIS	
Assessment of renewable energy resource potential and application for decentralized rural electrification using geographic information system (GIS)	0281
Survey of trees using ArcGIS offset line and digicam tree measurement techniques	0356
Gleaning	
A survey of macro-invertebrate gleaning in the Banate Bay Intertidal Area, Eastern Panay Island	0400
Global positioning systems	
An analysis of the precipitable water vapor observed over the PIMO GPS station	0514
Bathymetry and hydrobiology of Lake Mahagnao, Leyte	0380
Global warming	
High incidence of land snails mortality at Mt. Arayat, Pampanga: an evidence of global warming	0061
Relative sea level changes and worsening floods in the Western Pampanga Delta: causes and some possible mitigation measures	0366
GLV	
Phytochemical screening and toxicity of some green leafy vegetables consumed in Batac, Ilocos Norte	0212
Glycerol	
Glycerol-crosslinked polyacrylic acid hydrogels	0260
Synthesis of glycerol-crosslinked poly(methylmethacrylate) microparticles for the controlled delivery of mosquito repellent	0275
Glycosylated hemoglobin	
Diabetes and childbearing: exploring the options	0458
Goals	
Subsequent effects of intraruminal soluble glass bolus on plasma calcium,	0324

phosphorus and magnesium content of grazing does under backyard conditions in selected areas in Nueva Ecija, Philippines	
Goat manure	
Fertilizer management of arabica coffee during rejuvenation	0051
Gobiidae	
The goby Trypauchenopsis intermedia Volz 1903 (Gobiidae) from the Philippines	0180
Gold smelting	
Laboratory scale bioremediation of copper containing wastewater from gold smelting using biogenic hydrogen sulfide	0187
Golden apple snail	
Potential effects of commercial molluscicides used in controlling golden apple snails of the native snail <i>Vivipara costata</i> (Quoy & Gaimard)	0092
Golden birdwing	
Preliminary cytogenetic characterization of the golden birdwing, <i>Troides rhadamantus</i> (Lucas) (Lepidoptera: Papilionidae)	0216
Gompertz model	
Drying of mestizo 1 and mestizo 3 hybrid rice seeds	0035
Gonad stages	
Some aspects of the reproduction in the elongate sunset clam, <i>Gari elongata</i> (Lamarck 1818) from Banate Bay Area, West Central Philippines	0379
Gonadosomatic index	
Population structure and reproductive biology of <i>Siganus fuscescens</i> Houttuyn 1782 (Perciformes, Siganidae) in Pujada Bay, Southeastern Mindanao, Philippines	0214
Google Earth imagery	
Google earth: a tool for eliciting spatial information about forest degradation from local people	0592
Governance	
Bioresource management and our common future	0146
Gradient	
Gradient and scattering forces on a Kerr Nanosphere	0535
Graft copolymers	
Free radical synthesis of endfunctionalized polymers	0259
Grain quality	
Quantitative resistance loci (QRL) against bacterial blight ( <i>Xanthomonas oryza pv. oryzae</i> ) and leaf blast ( <i>Pyricularia orazae Sacc.</i> ) and quantitative trait loci (QTL) for grain qualities in rice ( <i>Oryza sativa L.</i> )	0098
Graph	
A study of singular bipartite graphs	0421

On triangle graphs	0430
Unit graphs: dimension and span	0431
Graph theory	
A study of singular bipartite graphs	0421
Graphite polymer composite	
Chemiresistor electronic nose based on graphite composite for the detection of volatile organic compounds	0243
Grease	
Evaluation of the effectiveness of fabric stain removers	0591
Green leafhopper	
Cellular and karyological variations in populations of green leafhopper <i>Nephotettix virescens</i> (distant) in the Philippines	0147
Green manure	
The utilization of azolla in the Philippines: biological problems and solutions	0124
Green revolution	
Agricultural biotechnology trends and challenges	0130
Greenhouse gases	
Greenhouse gas emissions of tobacco flue-curing process in the Philippines	0295
Groupers	
Deriving recruitment and spawning patterns from a survey of juvenile grouper (Pisces: Serranidae) occurrences in the Philippines	0328
Growth	
Some aspects of the population biology of the green tiger prawn <i>Penaeus semisulcatus</i> (De Haan, 1844) from Pilar and Capiz Bays, Northern Panay, West Central Philippines	0135
Growth factors	
Histomorphometry and osteoinductive growth factor levels of fracture callus versus iliac crest bone grafts	0472
Growth function	
Learning capability of a silnple neural network	0543
GSM	
Batangas health E-center	0282
Guatemala method	
Fortification of sugar with vitamin A-technology generation and transfer	0258
Guava leaf essential oil	
The antiseptic activity of Psidium guajava essential oil	0133
Gubas (Endospermum peltatum Merr.)	
Strength and related properties of bagras (Eucalyptus deglupta Blume) and gubas	0355

( <i>Endospermum peltatum</i> Merr.) in comparison with some tree plantation species in the Philippines	
Gum bleeding	
Dengue fever profile in the province of South Cotabato	0456
Gus gene system screening	
The use of <i>Gus</i> -reporter gene technique in the assessment of the competitive ability of <i>Rhizobium etli</i> nodulating <i>Phaseolus vulgaris</i> L. from the acidic soils of La Trinidad, Benguet, Philippines	0233
H- ions	
Optimized extraction of $H^{\hat{a}\in}$ by three-electrode faraday cup system in magnetized sheet plasma ion source	0562
H- production	
Effect of wall material on $H^{\hat{a} \in H}$ production in a plasma sputter-type ion source	0528
H. anncajanoae Kloppenburg et Siar	
Seven new endemic species of Hoya R. Br. (Apocynaceae) from the Philippines	0110
H. aurantiaca Kloppenburg, Siar et Cajano	
Seven new endemic species of Hoya R. Br. (Apocynaceae) from the Philippines	0110
H. landgrantensis Kloppenburg, Siar et Cajano	
Seven new endemic species of Hoya R. Br. (Apocynaceae) from the Philippines	0110
H. lazaroi Kloppeburg et Siar	
Seven new endemic species of Hoya R. Br. (Apocynaceae) from the Philippines	0110
H. lucardenasiana Kloppenburg, Siar et Cajano	
Seven new endemic species of Hoya R. Br. (Apocynaceae) from the Philippines	0110
H. polyrhizus	
State university developes dragon fruit products	0111
H. soligamiana Kloppenburg, Siar et Cajano	
Seven new endemic species of Hoya R. Br. (Apocynaceae) from the Philippines	0110
Habitat	
Review of the biodiversity of Southern Philippine Seas	0395
Habitat enhancement scheme	
Managing 'Sinarapan' <i>Mistichthys luzonensis</i> Smith in Lake Buhi, Camarines Sur: insights from its biology and population dynamics	0386
Habitat selection	
Wing ecomorphology and flight performance of bats in Pisan Cave, Kabacan, North Cotabato, Philippines	0235
Hadron radiation therapy	
A Monte Carlo simulation study on the interactions of proton, 7Li and 12C with water for hadron therapy application	0549

Haemorrhagic fever	
Growth patterns and infectivity of a dengue-2 virus strain propagated in the human myelomomocytic cell line K562	0471
Haliclona sp.	
Antimicrobial properties of some marine sponge (porifera) from Mactan, Cebu, Philippines	0132
Hall effect	
Double sign reversal of the hall voltage in $Bi_2Sr_2CaCu_2O_{8+\hat{1}'}$ thin film	0523
Hall voltage	
Double sign reversal of the hall voltage in $Bi_2Sr_2CaCu_2O_{8+\hat{1}'}$ thin film	0523
Haloacetic acids	
Occurrence and determination of Haloacetic Acids in Metro Manila drinking water	0267
Hamilton depression rating scale (HAM-D)	
The effect of individual versus group psychotherapy among grade six students with depression	0461
Hamiltonian of condensate particles	
Study of the perturbation to a bose-einstein gas	0571
Haplotypes,	
Genetic diversity of Philippine <i>Trichomonas vaginalis</i> isolates using the 5.8S ribosomal RNA gene	0177
Hardness	
Structure and mechanical property of MgO-ZrO2 ceramic doped with CeO2	0308
Hardy-Weinberg equilibrium	
Frequency distribution of blood groups ABO, MN and Rh factor in Philippine cosmopolitan, regional, and the national populations	0174
Hatching performance	
Spawning and hatching performance of the silvery black porgy <i>Sparidentex hasta</i> under hypersaline conditions	0336
Hausdorff dimension	
On the hausdorff dimension of sierpinski carpets	0426
Headache	
Practice patterns of physicians in the management of patients admitted for acute sinusitis in Chong Hua Hospital, January 2003 - June 2006	0498
Health	
Cultural diversity: the Filipino client providing culturally sensitive education on breast cancer and early screening	0453
Health and wellness	
Being diabetic: symptom distress and quality of life	0368

Comparative antidiabetic activity determination and characterization of potentially active metabolites from the leaves of <i>Syzygium malacunse</i> (makopa) and <i>Momordica charantia</i> (ampalaya)	0369
Effect of household level coconut oil usage on the lipid profiles of Filipino women	0370
Glycemic effect of betel nut (Areca catechu Linn.) fruit	0371
Hypoglycemic activity determination and characterization of potentially active metabolite(s) from the root crop <i>Smallantus sonchifolius</i> (yacon)	0372
Marine copepods: a potential rich source of omega-3 polyunsaturated fatty acids, a dietary supplement for healthy aging	0373
Physical activity, energy requirements and adequacy of dietary macro- and micronutrient intakes of older persons in a rural Filipino community	0374
Treatment outcomes of pulmonary TB patients enrolled at the Unilab-DOTS Center	er 0375
Health care provider	
Impacts of a patient's death under a health provider's care	0476
Health development	
Women in health development: the Mangyans of Mindoro Province	0512
Health policy	
Probing the decisions behind induced abortion in the Philippines	0502
Health practice	
A study on the common superstitious health beliefs and practices among randomly selected pregnant women in Punta Engaño, Mactan, Cebu	0511
Health risk assessment	
Total mercury in three fish species sold in a Metro Manila Public Market: monitoring and health risk assessment	0276
Healthy aging	
Marine copepods: a potential rich source of omega-3 polyunsaturated fatty acids, a dietary supplement for healthy aging	0373
Heat pump drier	
Heat pump drying of onion (Allium cepa)	0056
Heavy metals uptake	
Field growth responses of three tree species to mycorrhiza and fertilizers in the bioremediation of a mine waste dump	0351
Helicoverpa armigera (Hubner)	
Effects of gamma radiation on the testicular cells of corn earworm [helicoverpa armigera (Hubner)]	0163
Hematocrit	
Comparative effectiveness of an iron-fortified product with the sangkap pinoy seal and ferrous sulfate on the hemoglobin and hematocrit levels of five year old pre- school children at the Eskwelahang Munti Barangay Potrero, Malabon City	0446

Hemiptera	
The <i>Paurocephala psylloptera</i> -complex (Hemiptera: Psylloidea: Aphalaridae) in the Philippines with description of a new species	0085
Hemoglobin	
Comparative effectiveness of an iron-fortified product with the sangkap pinoy seal and ferrous sulfate on the hemoglobin and hematocrit levels of five year old pre- school children at the Eskwelahang Munti Barangay Potrero, Malabon City	0446
Hemolysin	
Local Vibrio isolates exhibit molecular characteristics distinct from reference V. harveyi and V. campbellii strains	0191
Hemoptyis	
The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0439
Hemorrhagic fever	
Dengue fever profile in the province of South Cotabato	0456
Hemorrhagic stroke	
The rifasaf project: a case-control study on risk factors for stroke among Filipinos	0505
Herbal medicines	
Complementary alternative medicine usage among diabetic patients of Ospital ng Maynila Medical Center from January 2004 - June 2005	0450
Herbed cookies	
Masakusikam herbed cookies: incorporation of leaves of malungay (Moringa oleifera), saluyot (Corchorus olitorius), kulitis (Amaranthus spinosus), sili (Capsicum frutescens) and kamote (Ipomea batatas)	0195
Hermitian	
Decompositions involving quaternion matrices and complex partitioned matrices	0412
Hertz model	
The effect of adhesion force on cell elastic modulus	0524
Heterogeneity	
On a lesile-type predator-prey model with diffusions	0405
Heterophyidiasis	
A new look at heterophyidiasis (intestinal fluke infection): a food-borne parasitic zoonosis in the Philippines	0491
Heteropoda sp.	
First description of the male of <i>Heteropoda cyperusiria</i> barrion & litsinger 1995 from the Philippines (Araneae: Sparassidae: Heteropodinae)	0025
Heteropodinae	
First description of the male of Heteropoda cyperusiria barrion & litsinger 1995	0025

0053
0019
0370
0597
0058
0437
0455
0345
0508
0304
0604
0582
0293
0156

Histogram backprojection	
Low-level color and texture feature extraction of coral reef components	0545
Histomorphometry	
Histomorphometry and osteoinductive growth factor levels of fracture callus versus iliac crest bone grafts	0472
HM2007	
Speech recognition controller for motorized wheelchair	0307
Honda Bay, Philippines	
Sedimentation rate in fringing reefs of Honda Bay, Puerto Princesa City, Palawan, Philippines with reference to coral reef condition	0335
Hormonal contraceptives	
Hormonal contraception: an approach to the demographic crisis in the Philippines	0473
Horn ring method	
The modified horn ring method as a tool in determining the age of carabao	0606
Houseflies	
Phenotypic distinction of enterobacterial flora of houseflies (Musca domestica L.)	0209
HOXA1	
Enhanced autophagic cell death in expanded polyhistidine variants of HOXA1 reduces PBX1 coupled transcriptional activity and inhibits neuronal differentiation	0166
Hoya, Hoya benvergarai Kloppenburg et Siar	
Seven new endemic species of Hoya R. Br. (Apocynaceae) from the Philippines	0110
HPLC	
Analysis of ecstasy in human urine by high performance liquid chromatography	0433
Human plasma	
Chromatographic analysis of ketamine and norketamine in human plasma and urine samples	0437
Human powered pump	
Reducing fossil fuel emission using treadle pump technology	0303
Human urine	
Chromatographic analysis of ketamine and norketamine in human plasma and urine samples	0437
Hundred Islands	
Four new records and one new species of Philippine myxomycetes from Hundred Islands and Anda Island, Pangasinan	0173
hupB	
Multiplex PCR detection of <i>Mycobacterium tuberculosis</i> and characterization of mutations in katG and rpoB genes of resistant strains in Metro Manila	0489
Hybrid	

Genetic diversity analysis of Philippine maize inbred lines using microsatellite markers	0053
Seed quality response to fungicide treatment of a line and F <sub>1</sub> hybrid seeds	0109
Hybrid fuel	
Microemulsified hybrid fuel from jatropha and coconut oils	0595
Hydro-steam distillation	
Studies on the utilization of citrus wastes	0273
Hydrobiology	
Bathymetry and hydrobiology of Lake Mahagnao, Leyte	0380
Hydrochloric acid	
Effect of dopant ions on the electrical conductivity and microstructure of polyaniline (emeraldine salt)	0246
Hydrodistillation	
Essential oil content and antibacterial activity of some Philippine plants	0251
Hydrodynamic equation	
Onset of turbulence in planar and circular pipe	0559
Hydrogel	
Factors contributing to the bioburden level of polyvinylpyrrolidone-kappa carrageenan hudrogel	0257
Glycerol-crosslinked polyacrylic acid hydrogels	0260
Hydrogen ion	
Effect of wall material on $H^{\hat{e}^{\epsilon}}$ production in a plasma sputter-type ion source	0528
Hydrogen ions	
Effect of cesium seeding on the production of $H^{\hat{a} \in \mathbb{C}}$ ions in a magnetized sheet plasma source	0525
Hydrogen sulfide	
Mechanism of $H_2S$ absorption using calcium-based sorbents under in-situ coal gasification conditions	0484
Hydrogenic helium ions	
Profile analysis of hydrogenic helium ions in a magnetized sheet plasma	0563
Hydroiodic acid	
Effect of dopant ions on the electrical conductivity and microstructure of polyaniline (emeraldine salt)	0246
Hydrotalcite	
Investigation of arsenate uptake by hydrotalcite at hyperalkaline and elevated temperature conditions	0296
Hydrous ethanol	
Properties and performance of MMSU hydrous biofuel	0598

Hylocereus undatus

State university developes dragon fruit products	0111
Hypercholesterolemia	
The effect of virgin coconut oil on the cholesterol levels of patients with hypercholesterolemia	0463
The effectiveness of the use of soybean powdered drink as supplement to lipid lowering agents vs. lipid lowering agents alone in hypercholesterolemia	0465
Hypertension	
The association of patient factors and adherence to prescribed medications among hypertensive patients	0435
Hypertensive patients' symptoms distress and quality of life	0474
Predictors of poor compliance to medications among adult Filipino patients diagnosed with hypertension in selected provinces of the Philippines	0500
The rifasaf project: a case-control study on risk factors for stroke among Filipinos	0505
Hypochlorite	
Improving quality and shelf-life of vegetables and fruits by evaporative cooling storage	0058
Hypoglycemia	
Comparative antidiabetic activity determination and characterization of potentially active metabolites from the leaves of <i>Syzygium malacunse</i> (makopa) and <i>Momordica charantia</i> (ampalaya)	0369
Hypoglycemic	
Hypoglycemic activity determination and characterization of potentially active metabolite(s) from the root crop <i>Smallantus sonchifolius</i> (yacon)	0372
Probiotic property of locally-isolated lactic acid bacteria and development of soya based probiotic product	0219
Hypoglycemic effect	
Glycemic effect of betel nut (Areca catechu Linn.) fruit	0371
I-carrageenan	
Nanoparticle dispersions in carrageenan films	0266
I. alba	
Alkaloid studies on selected Philippine plants: a summary report	0513
I. hardwickii	
Alkaloid studies on selected Philippine plants: a summary report	0513
IC50	
Evaluation of the potency of generic anticancer drugs against various human tumor cell lines using <i>in-vitro</i> cell-based assay and parallel line assay	0168
Ice-ice disease	
Marine fungi from Kappaphycus Alvarezii and K. Striatum: potential causative	0194

agents of ice-ice disease in farmed seaweeds

ICT	
Using the capabilities approach to analyze access to information and communication technologies (ICTS) by the poor	0603
Identification	
An interactive identification key: the philippine derbidae project	0186
Pestnet: an inexpensive diagnostics and pest management advisory tool for crop protection practitioners in the Philippines	0086
Ifugao, Mt. Province	
Muyong: an indigenous sustainable forest management system	0075
Image catalogue	
Preliminary taxonomic and image catalogue of copepod species (crustacea, copepoda) from the neritic waters of Northern Mindanao, Philippines	0218
Imaginary roots	
On sufficient condition for the existence of imaginary roots of a cubic polynomial equation	0422
Imines	
Microwave-assisted reaction: a cleaner and efficient method for the synthesis of indazoles and benzimidazoles	0596
Immobilization	
In situ compositing of rice straw using embased inoculant and chicken manure	0060
Microbial biomass as indicator of organic fertilizer mineralization in paddy soil	0071
Immunofluorescence assay test	
Growth patterns and infectivity of a dengue-2 virus strain propagated in the human myelomomocytic cell line K562	0471
Immunomodulator	
CpG oligodeoxynucleotides as immunomodulators of rBlo t 5-induced allergic reactions	0153
Immunosuppressive drug	
Cyclosporin analysis in blood by automated reserved-phase high performance liquic chromatographic method coupled with solid phase extraction and speed vacuum evaporation	1 0455
Impacts	
Impacts of a patient's death under a health provider's care	0476
Importation	
A bi-level multi-period optimization model for multiple feedstock bioenergy supply chains	0283
In vitro	
The comparative effects of purified fractions of Vitex negundo L. (lagundi) and	0447

crude extracts of <i>Cassia alata L</i> . (akapulko) and <i>Artemisia vulgaris L</i> . (damong maria) on inflammatory processes. <i>In vitro</i>	
An easy way to germinate sago palm seeds found	0038
In vitro study on the bactericidal effects of freshly prepared colloidal silver	0478
Survival of boar spermatozoa intended for <i>In vitro</i> fertilization (IVF) following different speed, duration and frequency of sperm washing	0116
InAs emitter	
Terahertz-time domain spectroscopic (THz-TDS) measurement of moderately- doped silicon using InAs Emitter under magnetic field	0578
Inbred line	
Genetic diversity analysis of Philippine maize inbred lines using microsatellite markers	0053
Incidence	
Development and incidence of <i>Neozygites fresenii</i> (Nowakowski) remaudiere & Keller (Zygomycetes: Entomophthorales) in aphis craccivora koch and its pathogenicity to three other aphididae (Hemiptera)	0029
Included vascular bundle	
Foliar anatomy of jade vine <i>Strongylodon macrobotrys</i> A. Gray (fabaceae): implications of ground and vascular tissue organization to growth and development	0171
Inclusions	
Resolving questioned paternity issues using a Philippine genetic database	0504
Indazoles	
Microwave-assisted reaction: a cleaner and efficient method for the synthesis of indazoles and benzimidazoles	0596
Indefinite integrals	
A convergence theorem without pointwise covergence	0408
Indigenous ethnic minorities	
Use of edible forest plants among indigenous ethnic minorities in cat tien biosphere reserve, Vietnam	0325
Indigenous fibers	
Development of Philippine tropical fabrics from indigenous sources	0588
Indigenous knowledge system (IKS)	
Eliciting indigenous knowledge system on natural resource management strategies: a case study in the cordillera region, Philippines	0602
Individual dynamics	
On the dynamics of resource-consumer-toxicant systems II: stress effects on reproduction and their implications on the survival of a population	0425
Indoor radon concentration	
National indoor radon survey in Filipino homes	0551

Induced abortion

Probing the decisions behind induced abortion in the Philippines	0502
Industrial tree plantation species	
Strength and related properties of bagras ( <i>Eucalyptus deglupta</i> Blume) and gubas ( <i>Endospermum peltatum</i> Merr.) in comparison with some tree plantation species in the Philippines	0355
Industry	
Galactomannan from Makapuno: another amazing coconut product	0376
Nucleonic gauges in Philippine industry: current application	0377
Radiation processing: a versatile technology for industry	0378
Infants and children	
Development of biochemical procedures for the diagnosis of genetic disorders	0155
Inflammatory processes	
The comparative effects of purified fractions of <i>Vitex negundo L</i> . (lagundi) and crude extracts of <i>Cassia alata L</i> . (akapulko) and <i>Artemisia vulgaris L</i> . (damong maria) on inflammatory processes. <i>In vitro</i>	0447
Influence	
Influence of boron-potassium fertilizer application on the occurrence of cracking in carrots ( <i>Daucus carrota</i> Linn)	0063
Information	
Using the capabilities approach to analyze access to information and communication technologies (ICTS) by the poor	0603
Information campaign	
Corn in the Philippines: feeding the population beyond the present	0020
Information communication technologies (ICTs)	
Eliciting indigenous knowledge system on natural resource management strategies: a case study in the cordillera region, Philippines	0602
Infrared spectra	
Hypoglycemic activity determination and characterization of potentially active metabolite(s) from the root crop <i>Smallantus sonchifolius</i> (yacon)	0372
Infusion	
Glycemic effect of betel nut (Areca catechu Linn.) fruit	0371
Inhibitors	
Evaluation and in-house validation of five DNA extraction methods for PCR-based STR analysis of bloodstained denims	0467
Injectables	
Hormonal contraception: an approach to the demographic crisis in the Philippines	0473
Ink	

Evaluation of the effectiveness of fabric stain removers	0591
Inland sea	
Movement of water across passages connecting Philippine inland sea basins	0389
Inorganic fertilizer	
Development of electronically controlled environment for the fast decomposition of organic fertilizer	0286
Microbial biomass as indicator of organic fertilizer mineralization in paddy soil	0071
Insect hosts of mites	
A checklist and host index of Philippine mites (acari) associated with arthropods	0609
Insect parts	
Food and feeding habits of Synodontis nigrita from the Osun River, SW Nigeria	0172
Instant rice	
Quick-cooking rice processes for Philippine rice cultivars	0346
Institutions	
Bioresource management and our common future	0146
Integer	
On construction of a quasi-regular self-complementary graph	0407
Integrals	
Fractional calculus and their applications	0416
Integrated circuits	
Localization and imaging of integrated circuit defect using simple optical feedback detection	0544
Integrated circuits (ICs)	
Near-IR spectral imaging of semiconductor absorption sites in integrated circuits	0553
Integration	
Modularity and integration in the forewing of the Philippine rice black bug (Scotinophara SPP. stål, hemiptera: pentatomidae)	0197
Intelligibility	
Development of feature set, classification implementation and applications for vowel migration/modification in Sung Filipino (Tagalog) texts and perceived intelligibility	0287
Intensity variation	
SVD vs PCA : comparison of performance in an imaging spectrometer	0573
Interaction	
Physiological signaling and adaptation processes to drought and salinity stress interactions in rice	0211
Interactive identification key	
An interactive identification key: the philippine derbidae project	0186

Interleukin 4	
Interleukin 4 -590 C/T gene polymorphism as a genetic marker for atopic asthma in a selected Filipino pediatric population	0479
Internal bond strength (IB)	
Utilization of acacia mangium for cement-bonded board manufacture	0123
Internal standard addition method	
Cyclosporin analysis in blood by automated reserved-phase high performance liquid chromatographic method coupled with solid phase extraction and speed vacuum evaporation	0455
International scientific publications	
International scientific productivity of selected universities in the Philippines	0480
Internet	
Impact of internet use on medical practice of FM residents and consultants in Davao City	0475
Interpenetrating network, κ-carrageenan	
Synthesis and characterization of chitosan and $\kappa$ -carrageenan IPN hydrogel systems for transdermal drug delivery	0274
Interstitial	
Clinical techniques for brachytherapy of head and neck tumors	0441
Interval mapping	
Mapping of the <i>Rf</i> gene of a cytoplasmic male sterile line of rice ( <i>Oryza sativa</i> L.) developed from a mutagenized source	0069
Intestinal fluke infection	
A new look at heterophyidiasis (intestinal fluke infection): a food-borne parasitic zoonosis in the Philippines	0491
Intradermal injection	
Comparative study on the use of fourth finger technique versus standard technique of intradermal injection of anti-rabies vaccine	0449
Intralumenal	
Clinical techniques for brachytherapy of head and neck tumors	0441
Invertebrates	
A post-tsunami assessment of coastal living resources of Langkawi Archipelago, Peninsular Malaysia	0391
Iodine	
Nanowire formation and polymer conformations of electropolymerized poly(3,4,- ethylenedioxythiophene) (PEDOT) on iodine-modified Au(111) single crystal electrode as probed by <i>in-situ</i> STM	0298
iodine deficiencies	
Radioisotopes as tools in food and nutrition research	0347

Iodine deficiency	
An Assessment of the selenium status of iodine-deficient and non-iodine deficient Filipino children	0434
Iodine-125	
Dosimetry application of gate in prostate brachytherapy	0459
Ion chromatography	
Ion chromatographic method with post-column fuchsin reaction for measurement of bromate in chlorinated water	0262
Ionic liquid	
Halogen-free, imidazolium based ionic liquids for organic and inorganic syntheses	0593
Ionizing radiation	
Radiation processing: a versatile technology for industry	0378
Ions	
Environmental isotope techniques in the lake-aquifer interaction between Laguna Lake and the aquifer in the south sector of Metro Manila	0317
Iota	
Nanoparticle dispersions in carrageenan films	0266
IPM	
Genetic methods for a rea-wide management of lepidopterous pests with emphasis on $F_1$ sterility	0469
Potential effects of commercial molluscicides used in controlling golden apple snails of the native snail <i>Vivipara costata</i> (Quoy & Gaimard)	0092
Technology transfer of <i>Cotesia</i> -based IPM for diamondback moth on lowland elevation crucifers in Luzon	0120
IPN	
Free radical synthesis of endfunctionalized polymers	0259
Ipomoea aquatica	
The fate of pesticides in rice paddy ecosystem using nuclear techniques	0049
Ipomoea muricata (Jacq.)	
Antimicrobial activity of the crude ethanol extract of the seeds of <i>Ipomoea muricata</i> (Jacq.) convolvulaceae against selected clinical isolates	0241
Ipomoea muricata (L.) Jacq.	
Alkaloid studies on selected Philippine plants: a summary report	0513
IR 58025A	
Seed quality response to fungicide treatment of a line and F <sub>1</sub> hybrid seeds	0109
IR range	
Near-IR spectral imaging of semiconductor absorption sites in integrated circuits	0553
IR-64	

Drying of mestizo 1 and mestizo 3 hybrid rice seeds	0035
IR64	
2 more private rice hybrids for wider farmers' choice	0001
Ircinia sp.	
Antimicrobial properties of some marine sponge (porifera) from Mactan, Cebu, Philippines	0132
IRM	
Survey of alternate host plants of the Asian corn borer Ostrinia furnacalis (Guenee): maramais Trypsacum laxum, in Pangasinan	0114
Iron	
Radioisotopes as tools in food and nutrition research	0347
Iron concentration	
Kinetics of iron in the development of rapid screening technique for iron toxicity tolerance in rice	0066
Iron garnets	
Synthesis and characterization of $A1^{+3}$ doped $R_3Fe_{5-x}A1_xO_{12}$ (R=Dy and Y) iron garnets	0574
Iron toxicity	
Kinetics of iron in the development of rapid screening technique for iron toxicity tolerance in rice	0066
Quantitative trait loci (QTL) analysis for iron toxicity tolerance in rice (Oryza sativa L.)	0099
Iron-deficiency	
Nutrition problems of the urban family	0492
Iron-fortified	
Comparative effectiveness of an iron-fortified product with the sangkap pinoy seal and ferrous sulfate on the hemoglobin and hematocrit levels of five year old pre- school children at the Eskwelahang Munti Barangay Potrero, Malabon City	0446
Irradiation	
Irradiated long bone transplants in limb saving surgeries for extremity bone cancers	0481
Irrigation systems	
Research and development of the spiral pump for water-disadvantaged areas in the Philippines: part I. statistically aided design of prototypes at Los Banos	0101
Research and development of the spiral pump for water-disadvantaged areas in the Philippines: part II. field tests under actual farm conditions in Abra	0102
Water management for improved post-rice production of upland crops in irrigated paddies	0126
IS6110	
Multiplex PCR detection of Mycobacterium tuberculosis and characterization of	0489

mutations in katG and rpoB genes of resistant strains in Metro Manila	
ISI	
International scientific productivity of selected universities in the Philippines	0480
Island	
Some butterflies of Boracay Island	0278
Isoorientin	
Phytochemical studies on the leaves of Vitex negundo L. (lagundi)	0496
Isoprocarb	
The fate of pesticides in rice paddy ecosystem using nuclear techniques	0049
Isotope hydrology	
Isotope and geochemical methods in water resources assessment and environmental management	0541
Isotope methodologies	
Isotope and geochemical methods in water resources assessment and environmental management	0541
Isotope techniques	
Nuclear science and technology: perspectives and prospects for Philippine development	0554
ΰ-carrageenan	
Characterization of a $\hat{I}^{\circ}$ -Carrageenase-producing marine bacterium, Isolate ALAB-001	0148
ΰ-carrageenase	
Characterization of a $\hat{I}^{o}$ -Carrageenase-producing marine bacterium, Isolate ALAB-001	0148
Jaggery	
Sweet sorghum jaggery as alternative media for the production of commercial yeast Janitor fish	0117
Arsenic and mercury concentrations of the waters and janitor fishes (Pterygoplichthys spp.) in the Marikina River, Philippines	0134
Lipid peroxidation and patterns of cadmium and lead accumulation in the vital organs of suckermouth armored catfish <i>Pterygoplichthys pardalis</i> castelnau from Marikina River	0190
Salinity tolerance of introduced South American sailfin catfishes (Loricariidae: Pterygoplichthys GILL 1858)	0223
Jathropha curcas	
Optimization of <i>Jathropha curcas</i> (tubang bakod) and <i>Calophyllum inophyllum</i> (bitaog) as a viable source of activated carbon for methylene blue adsorption	0299
Jatropha	
MMSU produces 2 million Jatropha seedlings for PNOC-AFC	0072

Jatropha curcas

1	
Effects of antioxidant extracted from leaves of "banaba" ( <i>Lagerstroemia speciosa</i> , <i>L</i> .), mangosteen ( <i>Garcinia mangostana</i> , <i>L</i> .) and "tsaang gubat" ( <i>Ehretia microphylla L</i> .) on the oxidation stability of biodiesel	0290
Lactic acid fermentation from <i>Jatropha curcas</i> L. press cake and raw cassava starch using <i>Rhizopus oryzae</i> NRRL-395	0594
Jatropha oil	
Microemulsified hybrid fuel from jatropha and coconut oils	0595
Join	
Secure domination in a network: a protection strategy	0420
K-carrageenan	
Nanoparticle dispersions in carrageenan films	0266
K562 cells	
Growth patterns and infectivity of a dengue-2 virus strain propagated in the human myelomomocytic cell line K562	0471
Kalata B1	
Molecular investigation of cyclotides in Rubiaceae and Cucurbitaceae	0199
Kalingag	
Preliminary screening of methanolic extracts of kalingag ( <i>Cinnamomum mercadoi</i> Vindal) and Talisay ( <i>Terminalia catappa</i> ) against methicillin resistant Staphylococcus aureus (MRSA)	0217
Kamahong	
The status of tilapia aquaculture in Lake Sebu, South Cotabato	0337
Kanamycin	
Lemon grass (Cymbopogon citratus)extract: a promising antibacterial juice	0189
Kappa-carrageenan (KC)	
Radiation-modified natural polymers for biomedical applications	0564
Kappaphycus alvarezii	
Characterization of a ΰ-Carrageenase-producing marine bacterium, Isolate ALAB-001	0148
Kappaphycus sp.	
Marine fungi from <i>Kappaphycus Alvarezii</i> and <i>K. Striatum</i> : potential causative agents of ice-ice disease in farmed seaweeds	0194
Karyogram	
Preliminary cytogenetic characterization of the golden birdwing, <i>Troides rhadamantus</i> (Lucas) (Lepidoptera: Papilionidae)	0216
katG	
Multiplex PCR detection of <i>Mycobacterium tuberculosis</i> and characterization of mutations in katG and rpoB genes of resistant strains in Metro Manila	0489

Kawayan tinik	
Researchers find ways to improve productivity of kawayan tinik	0103
Kelin-Gordon equation	
Incompressible limit of the compressible euler-poisson system for general initial data	0417
Kerr Nanosphere	
Gradient and scattering forces on a Kerr Nanosphere	0535
Ketamine	
Chromatographic analysis of ketamine and norketamine in human plasma and urine samples	0437
Kidney imaging	
The development of technetium - 99m radiopharmaceuticals: technetium -99m phytate	0361
Kim-Anderson (KA) approach	
Flux Creep Investigation in $Bi_2Sr_2CaCu_2O_{8+\delta}$ high-temperature superconductor	0533
Kinetic model	
Ethanol fermentation under vacuum pressure	0293
Kinetic study	
Fermentation kinetics of gelatin-immobilized <i>Lactobacillus plantarum</i> BS using skim milk as substrate	0169
Kinetics	
Kinetics of non-isothermal crystallization of coconut-based cholesteryl ester: avrami and ozawa approaches	0542
Kirby-Bauer disc diffusion method	
Phenotypic distinction of enterobacterial flora of houseflies (Musca domestica L.)	0209
Kirby-Bauer Disk Diffusion Method	
Essential oil content and antibacterial activity of some Philippine plants	0251
Kokoona ochracea	
Studies on the outer root bark of <i>Kokoona ochracea</i> (ELM) Merr. (family celastraceae)	0510
Kulitis	
Masakusikam herbed cookies: incorporation of leaves of malungay (Moringa oleifera), saluyot (Corchorus olitorius), kulitis (Amaranthus spinosus), sili (Capsicum frutescens) and kamote (Ipomea batatas)	0195
Laboratory diagnosis	
The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0440
Lactic acid bacteria	

Fermentation kinetics of gelatin-immobilized <i>Lactobacillus plantarum</i> BS using skim milk as substrate	0169
Lactic acid fermentation	
Lactic acid fermentation from <i>Jatropha curcas</i> L. press cake and raw cassava starch using <i>Rhizopus oryzae</i> NRRL-395	0594
Lactobacilli	
Probiotic property of locally-isolated lactic acid bacteria and development of soya based probiotic product	0219
Lactobacillus plantarum	
Fermentation kinetics of gelatin-immobilized <i>Lactobacillus plantarum</i> BS using skim milk as substrate	0169
Lagundi	
Clinical trial of Vitex negundo tablet as antitussive	0442
Cultural Management and postharvest handling of lagundi (Vitex negundo L.)	0454
Mutagenicity, clastogenicity and antimutagenicity of expressions, decoctions, tablet and syrup preparations from "lagundi" ( <i>Vitex negundo</i> L.)	0490
Pharmacognostical studies on Vitex Negundo L.	0494
Pharmacologic and toxicologic studies on lagundi (Vitex negundo, L.)	0495
Phytochemical studies on the leaves of Vitex negundo L. (lagundi)	0496
Lahar	
Adaptability and management of vegetables legumes and cereals in ashfall and lahar areas	0002
Effects of lahar on the water quality of the rivers and tributaries of Pinatubo volcance	0363
Improving the production of corn and rice with controlled availability fertilizer (CAF) in Pinatubo Lahar	0059
Lake Danao, Cebu	
Fish culture in cages in Lake Danao, Cebu	0329
Lake ecosystem	
Assessment of local government's implementation of open access policy in Taal Lake, Philippines: effects on lake conservation and management	0326
Lake Lanao	
Assessment of fish fauna in Lake Lanao	0136
Lake Lanao: its past and present status	0385
Lake management	
Sustainable development of Philippine Lake Resources: an agenda for research and development	0401
Lakes	
Zooplankton spatial abundance and distribution in the West Bay of Laguna de Bay (Philippines) with notes on potential implications to food and health security	0237

Lamp	
Batangas health E-center	0282
Land use change	
Predicting the effects of land use on runoff and sediment yield in selected sub- watersheds of the manupali river using the Arcswat model	0093
Landslide early warning systems	
A tilt, soil moisture, and pore water pressure sensor system for slope monitoring applications	0311
Lapu-lapu	
Deriving recruitment and spawning patterns from a survey of juvenile grouper (Pisces: Serranidae) occurrences in the Philippines	0328
Larvae	
Butterfly manure: a novel source of bio-organic fertilizer	0011
Lasioderma serricorne (Fabricius)	
Control of the tobacco beetle, <i>Lasioderma serricorne</i> (Fabricius) (Coleoptera: Anobiidae), with carbon dioxide under high pressure	0019
Latent heat	
Heat pump drying of onion (Allium cepa)	0056
Lateral force microscopic (LFM)	
Surface molecular aggregation states of monodisperse and polydisperse polystyrene films on scanning force microscope	0309
Lateral resolution	
Angular and lateral resolution study in pCT imaging involving biological tissues	0515
Lauraceae	
Essential oil content and chemical composition of Philippine <i>Cinnamomum mercadoi</i> vidal (Lauraceae)	0252
Lauryl sulfate	
Halogen-free, imidazolium based ionic liquids for organic and inorganic syntheses	0593
LBL films	
Preparation and investigation of spin self assembled multilayer film of poly(3,4 ethylenedioxythiophene): poly(4 styrenesulfonate) and poly(alylamine hydrochloride) as organic light-emitting diode	0302
LC50	
Phytochemical screening and toxicity of some green leafy vegetables consumed in Batac, Ilocos Norte	0212
Lead	
Metal absorption capacities of $\kappa$ -carrageenan blends	0263
Leaf blast	

Quantitative resistance loci (QRL) against bacterial blight ( <i>Xanthomonas oryza pv. oryzae</i> ) and leaf blast ( <i>Pyricularia orazae Sacc.</i> ) and quantitative trait loci (QTL) for grain qualities in rice ( <i>Oryza sativa L.</i> )	0098
Leaf chewers	
Damage assessment of lepidopterous pests of onion in Nueva Ecija	0024
Least standard difference (LSD)	
Effects of age and needle length on the seroconversion and herd immunity of a commercial trivalent $(O_1, A_{24}, C_3)$ oil-based FMD vaccine	0041
Ledermuelleriopsis	
Some Philippine raphignathoidea (acari). IV. the genera <i>Ledermuelleriopsis</i> willmannn and <i>Zetzellia</i> oudemans (stigmaeidae)	0090
Left ventricular ejection fraction	
Effect of trimetazidine on left ventricular ejection fraction and time to develop 1mm ST depression in patients with chronic stable angina: a meta-analysis	0462
Lemongrass	
Antimicrobial and cytotoxic terpenoids from Cymbopogon citratus Stapf.	0242
Lennard-Jones potential	
The effect of adhesion force on cell elastic modulus	0524
Lepidoptera	
A checklist of the rhopalocera (lepidoptera) of Mount Arayat, Pampanga, Philippines	0013
Genetic methods for a rea-wide management of lepidopterous pests with emphasis on $F_1$ sterility	0469
A survey of the rhopalocera (lepidoptera) of Mt. Makiling, Laguna, Philippines	0115
Lepidopterous pests	
Damage assessment of lepidopterous pests of onion in Nueva Ecija	0024
Lernaea cyprinacea	
Parasitic crustaceans in fishes from some Philippine lakes	0390
Lesile-type predator-prey model	
On a lesile-type predator-prey model with diffusions	0405
Lichen acids	
Fruticose lichens from selected sites in Luzon as sources of biologically active lichen acids	0176
Lidar	
Effect of the diurnal variation of the convective boundary layer height over Metro Manila on pollutant concentration	0315
Life history	
Biology of the orchid weevil, Orchidophilus aterrimus (waterhouse)	0143

Lifestyle

5	
The association of patient factors and adherence to prescribed medications among hypertensive patients	0435
Ligaments	
The role of radiation in tissue banking	0506
Light-emitting diode	
Device fabrication of 60 µm resonant cavity light-emitting diode	0520
Light-emitting diodes	
Two-photon optical beam-induced current microscopy of light-emitting diodes	0585
Lignin degrading activity	
Degradation of pyrene, fluorene and fluoranthene: the role of lignin peroxidase and manganese peroxidase from Ganoderma lucidum	0154
Lignin peroxidase	
Degradation of pyrene, fluorene and fluoranthene: the role of lignin peroxidase and manganese peroxidase from Ganoderma lucidum	0154
Lignocellulosic	
Biodegradation of banana stalks and sweet sorghum bagasse under solid state culture of <i>Pleurotus sajor caju</i>	0140
Lilium philippinense	
Geographic variation in vegetative and flower morphometry among populations of <i>Lilium philippinense</i> Baker (liliaceae), an endemic species in the Philippines	0179
Limestone	
Mechanism of $H_2S$ absorption using calcium-based sorbents under in-situ coal gasification conditions	0484
Limnocharis	
<i>Limnocharis flava</i> L. BUCH., and <i>Salvinia molesta</i> MITCHELL: potential threats to aquatic ecosystem in Luzon	0067
Limnocharis flava	
<i>Limnocharis flava</i> L. BUCH., and <i>Salvinia molesta</i> MITCHELL: potential threats to aquatic ecosystem in Luzon	0067
Limonene	
The antiseptic activity of Psidium guajava essential oil	0133
Line intercept transect (LIT) method	
A post-tsunami assessment of coastal living resources of Langkawi Archipelago, Peninsular Malaysia	0391
Linear displacement functions	
Elastic-plastic analysis of underground openings by the finite element method	0292
Linkage map	

Mapping of the <i>Rf</i> gene of a cytoplasmic male sterile line of rice ( <i>Oryza sativa</i> L.) developed from a mutagenized source	0069
Liouville equation	
Onset of turbulence in planar and circular pipe	0559
Lipid	
The effectiveness of the use of soybean powdered drink as supplement to lipid lowering agents vs. lipid lowering agents alone in hypercholesterolemia	0465
Lipid peroxidation	
Lipid peroxidation and patterns of cadmium and lead accumulation in the vital organs of suckermouth armored catfish <i>Pterygoplichthys pardalis</i> castelnau from Marikina River	0190
Liquid crystal	
Morphology-controlled polyacetylene films synthesized in liquid crystalline solvents	0265
Liquid-liquid extraction	
Analysis of ecstasy in human urine by high performance liquid chromatography	0433
Live weight	
The relationship of shell dimensions and shell volume to live weight and soft tissue weight in the mangrove clam, <i>Polymesoda erosa</i> (Solander, 1786) from Northern Australia	0221
Livestock	
The utilization of azolla in the Philippines: biological problems and solutions	0124
Livestock products	
The economic impact of FMD and its control in the Philippines	0039
Livestock revolution	
The economic impact of FMD and its control in the Philippines	0039
Local knowledge	
Google earth: a tool for eliciting spatial information about forest degradation from local people	0592
Locustellidae	
DNA barcoding of birds in the University of the Philippines, Diliman Campus, with emphasis on striated grassbirds <i>Megalurus palustris</i>	0159
Lonchodinae	
A new genus and species of stick insect (Phasmatodea: Heteronemiidae: Lonchodinae) from the Philippine Islands	0202
Long line (kitay)	
Stock assessment of commercially important fishes in Naujan Lake	0399
Lophiotoma	
Larger forms in lophiotoma: four new species described in the Philippines and three	0188
from elsewhere in the Indo-Pacific

Loss assessment	
Quantitative and qualitative assessment of corn postharvest losses	0097
Loss reduction	
Quantitative and qualitative assessment of corn postharvest losses	0097
Low calorie diet	
The effectiveness of thinber on weight reduction as an adjunct to low calorie diet prescription among adults: a randomized controlled study	0466
Low density lipoprotein	
Effect of household level coconut oil usage on the lipid profiles of Filipino women	0370
Low external input sustainable agriculture	
Cocoon yield and quality of silkworm fed with leaves harvested from mulberry grown under conventional, LEISA, and organic agro-ecosystem manipulations	0015
Low-acid foods	
Standardization of thermal processes for local foods with emphasis on low-acid foods	0348
Lowland forest	
Occurrence and diversity of myxomycetes (plasmodial slime molds) in Mt. Palay- palay, National Park, Cavite, Philippines	0204
Lowland rice	
Organic matter residue management for the improvement of soil quality in lowland rice systems	0083
Ludong	
Save Ludong, the most delicious and expensive fish in Republic of the Philippines	0334
Ludwigia micrantha	
Comparison of pollen abortiveness in four weed species treated with mercuric chloride	0152
Lung fluke	
The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0439
Luteolin	
Phytochemical studies on the leaves of Vitex negundo L. (lagundi)	0496
Luzon, Philippines	
Geographic variation in vegetative and flower morphometry among populations of <i>Lilium philippinense</i> Baker (liliaceae), an endemic species in the Philippines	0179
Lycopodiaceae	
Species richness, assessment and conservation of some economically important Philippine lycopods	0227

Lycopodium,

Molecular cloning of cysteine protease inhibitors from four endemic Philippine plants	0198
M. baltazarae	
A new genus and species of aphalaridae (psylloidea, hemiptera) from Mount Makiling, Luzon Island, Philippines	0077
M. brevicephala	
A new genus and species of aphalaridae (psylloidea, hemiptera) from Mount Makiling, Luzon Island, Philippines	0077
M. minuta	
A new genus and species of aphalaridae (psylloidea, hemiptera) from Mount Makiling, Luzon Island, Philippines	0077
M. tuberculosis	
The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0440
Multiplex PCR detection of <i>Mycobacterium tuberculosis</i> and characterization of mutations in katG and rpoB genes of resistant strains in Metro Manila	0489
Mabuya multifascinata	
Survey and census of ground lizards in the permanent field laboratory areas (PFLAS) in Mt. Makiling forest reserve	0230
Machiku	
Propagation of machiku bamboo through air layering	0096
Macrobrachium rosenbergii	
Genetic diversity in wild stocks of the giant freshwater prawn ( <i>Macrobrachium rosenbergii</i> ): implications for aquaculture and conservation	0330
Magnesia	
Structure and mechanical property of MgO-ZrO2 ceramic doped with CeO2	0308
Magnesium	
Creating a master plan for coconut sap sugar	0021
Effects of lahar on the water quality of the rivers and tributaries of Pinatubo volcano	0363
Magnesium diboride	
Synthesis of bulk superconducting magnesium diboride	0575
Magnetic equator	
Simultaneous ground-based observations of electric and magnetic field variation near the magnetic equator for space weather study	0568
Magnetic field variation	
Simultaneous ground-based observations of electric and magnetic field variation near the magnetic equator for space weather study	0568

Magnetization

Dinalar interaction in a one dimensional ising ring	0522
	0322
Magneto-optical trap	0546
Measurement of the temperature of rubidium atoms in a magneto-optical trap	0546
Magnetron	
Calorimetric measurements of the output power of the 2.48 GHz commercial magnetron	0518
Magnitude	
The international and local scene in food irradiation and its relevance to future directions for food irradiation in the Philippines	0064
Maintaining grain quality	
Optimization of batch recirculating dryer performance	0082
Maitum Village	
Diversity and status of butterflies in Maitum Village, Tandag, Surigao del Sur, Philippines	0158
Maize	
Genetic diversity analysis of Philippine maize inbred lines using microsatellite markers	0053
Mak gum	
Galactomannan from Makapuno: another amazing coconut product	0376
Makapuno	
Galactomannan from Makapuno: another amazing coconut product	0376
Malampaya sound sediments	
Preliminary results on the use of clay to control <i>Pyrodinium</i> bloom: a mitigation strategy	0392
Male gestation	
Histo-physiological development in the gestation of the male seahorse, <i>Hippocampus comes</i> Cantor 1850	0181
Male Heteropoda cyperusiria	
First description of the male of <i>Heteropoda cyperusiria</i> barrion & litsinger 1995 from the Philippines (Araneae: Sparassidae: Heteropodinae)	0025
Mallard duck	
Growth performance and yield of selected strain (gift) nile tilapia ( <i>Oreochromis niloticus</i> L.) in lowland irrigated ricefields integrated with azolla and mallard duck	0055
Malnutrition	
Improving human fetal development: the super baby	0477
Radioisotopes as tools in food and nutrition research	0347
Malungay	

Masakusikam herbed cookies: incorporation of leaves of malungay (Moringa oleifera), saluyot (Corchorus olitorius), kulitis (Amaranthus spinosus), sili (Capsicum frutescens) and kamote (Ipomea batatas)	019
Man-made gaps	
Effects of forest gaps on foliage insect diversity in the perment field laboratory areas (PFLAS)in Mt. Makiling Forest Reserve	035
Management	
Ecosystem-based approach to aquaculture management	038
Sustainable marine fisheries production in the Philippines	033
Mandible	
Mandibular shape variation in the ants <i>Diacamma rugosum</i> and <i>Pheidologeton</i> diversus philippinus	019
Manganese peroxidase	
Degradation of pyrene, fluorene and fluoranthene: the role of lignin peroxidase and manganese peroxidase from Ganoderma lucidum	015
Mangosteen	
Effects of antioxidant extracted from leaves of "banaba" ( <i>Lagerstroemia speciosa</i> , <i>L</i> .), mangosteen ( <i>Garcinia mangostana</i> , <i>L</i> .) and "tsaang gubat" ( <i>Ehretia microphylla L</i> .) on the oxidation stability of biodiesel	029
Mangrove	
Preliminary survey of mangrooves and pine forest of Masinloc, Zambales	035
Mangrove clam	
The relationship of shell dimensions and shell volume to live weight and soft tissue weight in the mangrove clam, <i>Polymesoda erosa</i> (Solander, 1786) from Northern Australia	022
Mangrove forest	
Carbon storage and sequestration potential of upland and mangrove forest ecosystem in Binahaan Watershed and Padre Burgos Quezon	034
Mangrove reforestation	
Will mangrove reforestation provide net benefits: a case in Sibunag, Guimaras	031
Mangroves	
Will mangrove reforestation provide net benefits: a case in Sibunag, Guimaras	031
State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan	032
Manila Bay	
<sup>137</sup> Cs and <sup>210</sup> Pb distribution in Manila Bay sediment	023
Mankayan	
The Identification of metallophytes in the Fe and Cu enriched environments of Brookes Point, Palawan and Mankayan, Benguet and their Implications to	026

Phytoremediation

Manure

Development of electronically controlled environment for the fast decomposition of 0286 organic fertilizer

## Mapping

Molecular and phenotypic studies of resistance genes introgressed from wild tomato 0073 (*Lycopersicon chilense*) to cultivated tomato (*Lycopersicon esculentum*) against tomato leaf curl virus isolate from the Philippines

# Mapping population

Quantitative trait loci (QTL) analysis for iron toxicity tolerance in rice (Oryza sativa	0099
L.)	
Maramais	
Survey of alternate host plants of the Asian corn borer <i>Ostrinia furnacalis</i> (Guenee): maramais Trypsacum laxum, in Pangasinan	0114

## Marinduque

Bioeconomics of native pig production in Marinduque	0010
Marine biodiversity	
Review of the biodiversity of Southern Philippine Seas	0395
Marine copepoda	
Marine copepods: a potential rich source of omega-3 polyunsaturated fatty acids, a dietary supplement for healthy aging	0373
Marine protected area (MPA)	
The relevance of governance institutions in marine protected area design and management: lessons from Northeastern Iloilo, Philippines	0394
Marine science	
Some aspects of the reproduction in the elongate sunset clam, <i>Gari elongata</i> (Lamarck 1818) from Banate Bay Area, West Central Philippines	0379
Bathymetry and hydrobiology of Lake Mahagnao, Leyte	0380
Development of a simple biological model of vertical phytoplankton distribution	0381
Ecosystem-based approach to aquaculture management	0382
Environmental and production survey methodology to estimate severity and extent of aquaculture impact in three areas of the Philippines	0383
Focal benthic mollusks (Mollusca: Bivalvia and Gastropoda) of selected sites in Tubbataha Reef National Marine Park, Palawan, Philippines	0384
Lake Lanao: its past and present status	0385
Managing 'Sinarapan' <i>Mistichthys luzonensis</i> Smith in Lake Buhi, Camarines Sur: insights from its biology and population dynamics	0386

A model to estimate aquaculture carrying capacity in three areas of the Philippines

A modelling of eutrophication in Laguna de Bay as a tool for rational resource

0387

0388

management

	Movement of water across passages connecting Philippine inland sea basins	0389
	Parasitic crustaceans in fishes from some Philippine lakes	0390
	A post-tsunami assessment of coastal living resources of Langkawi Archipelago, Peninsular Malaysia	0391
	Preliminary results on the use of clay to control <i>Pyrodinium</i> bloom: a mitigation strategy	0392
	Recommendations for practical measures to mitigate the impact of aquaculture on the environment in three areas of the Philippines	0393
	The relevance of governance institutions in marine protected area design and management: lessons from Northeastern Iloilo, Philippines	0394
	Review of the biodiversity of Southern Philippine Seas	0395
	The scientific basis of marine fish farm regulation	0396
	SEAFDEC contribution to the ecological awareness of Philippine Lakes	0397
	The shallow water marine sponges (Porifera) of Cebu, Philippines	0398
	Stock assessment of commercially important fishes in Naujan Lake	0399
	A survey of macro-invertebrate gleaning in the Banate Bay Intertidal Area, Eastern Panay Island	0400
	Sustainable development of Philippine Lake Resources: an agenda for research and development	0401
	Technological improvements in commercial <i>Eucheuma</i> cultivation: a short communication	0402
	Wind stress curl and surface circulation in the South China Sea and the Philippine Sea	0403
	Women in the December 26 tsunami: how have they coped; how can we help?	0404
N	larine sediments	
	<sup>137</sup> Cs and <sup>210</sup> Pb distribution in Manila Bay sediment	0239
N	larine site	
	Environmental and production survey methodology to estimate severity and extent of aquaculture impact in three areas of the Philippines	0383
	A model to estimate aquaculture carrying capacity in three areas of the Philippines	0387
	Recommendations for practical measures to mitigate the impact of aquaculture on the environment in three areas of the Philippines	0393
Ν	larine-derived fungi,	
	Marine fungi from <i>Kappaphycus Alvarezii</i> and <i>K. Striatum</i> : potential causative agents of ice-ice disease in farmed seaweeds	0194
Ν	larker-aided selection	
	Mapping quantitative trait loci associated with resistance to preharvest sprouting in wheat	0070

Markers

Quantitative trait loci (QTL) analysis for iron toxicity tolerance in rice (Oryza sativa L.)	0099
Marpsylla	
A new genus and species of aphalaridae (psylloidea, hemiptera) from Mount Makiling, Luzon Island, Philippines	0077
MAS	
Mapping quantitative trait loci associated with resistance to preharvest sprouting in wheat	0070
Mass rearing	
Some factors affecting mass rearing of the Vanda thrips, Dichromothrips corbetti (priesner) (thysanoptera: thripidae)	0047
Mastitis	
Diagnosis and control of porcine epidemic diarrhea: case report	0034
Multiplex polymerase chain reaction for simultaneous detection of major mastitis- causing pathogens in buffalo milk	0074
Maternal glucose	
Diabetes and childbearing: exploring the options	0458
Mathematics	
On a lesile-type predator-prey model with diffusions	0405
Some characterizations of the direct product of gassmann triples	0406
On construction of a quasi-regular self-complementary graph	0407
A convergence theorem without pointwise covergence	0408
Convex domination in the composition and cartesian product of graphs	0409
Cubic construction over binary cyclic codes	0410
The daugavet equation for a sequence of operators	0411
Decompositions involving quaternion matrices and complex partitioned matrices	0412
Deformation quantization and quantum moment maps	0413
Determining optimal inventory levels of multiple repairable items	0414
Forecasting dengue incidence in the National Capital Region, Philippines: using time series analysis with climate variables as predictors	0415
Fractional calculus and their applications	0416
Incompressible limit of the compressible euler-poisson system for general initial data	0417
The minimal closed geodetic numbers of graphs	0418
Regular singular and nonsingular graphs of arbitrarily large order exist	0419
Secure domination in a network: a protection strategy	0420
A study of singular bipartite graphs	0421

On sufficient condition for the existence of imaginary roots of a cubic polynomial equation	0422
Symmetric designs from a rahilly family of pre-difference sets of orders 2 and 3	0423
Symmetry reductions and a posteriori finite element error estimators for bifurcation problems	0424
On the dynamics of resource-consumer-toxicant systems II: stress effects on reproduction and their implications on the survival of a population	0425
On the hausdorff dimension of sierpinski carpets	0426
On the number of distinct self-dual codes over Z <sub>9</sub>	0427
On the radiality assumption for existence and blowing up	0428
On the unique solvability of a volevic system of singular partial differential equations	0429
On triangle graphs	0430
Unit graphs: dimension and span	0431
Vertex cover of some supergraphs of planar grid	0432
Matrix	
Regular singular and nonsingular graphs of arbitrarily large order exist	0419
Maxwell equations	
THz radiation from high-Tc superconducting materials and its applications	0582
МСН	
Basic health services and population growth	0436
MCS	
Angular and lateral resolution study in pCT imaging involving biological tissues	0515
Mealybug bum	
Invasion of the buff coconut mealybug ( <i>Nipaecoccus nipae</i> ) in U.P. Los Baños campus, elucidation of the confounded "mealybug burn" damage and practical control	0065
Mealybugs	
Two <i>Neozygites</i> species (Zygomycetes: Entomophthorales) infecting aphids and mealybugs on Leyte Island	0076
Mechanical	
Mechanical, chemical and surgical methods of contraception	0483
Structure and mechanical property of MgO-ZrO2 ceramic doped with CeO2	0308
Mechanical dryers	
Quantitative and qualitative assessment of corn postharvest losses	0097
Mechanical refrigeration	
Design and development of non-refrigerated storage system for selected fruits and vegetables	0027

Medication events monitoring system

	The association of patient factors and adherence to prescribed medications among hypertensive patients	0435
M	edicinal chemistry	
	Rapid synthesis under mild conditions of an acrylic diamide N, N, N', N'T etrabutylphthalamide, a potential antimicrobial agent	0599
M	edicine	
	Analysis of ecstasy in human urine by high performance liquid chromatography	0433
	An Assessment of the selenium status of iodine-deficient and non-iodine deficient Filipino children	0434
	The association of patient factors and adherence to prescribed medications among hypertensive patients	0435
	Basic health services and population growth	0436
	Chromatographic analysis of ketamine and norketamine in human plasma and urine samples	0437
	Chronic idiopathic urticaria (CIU), unveiled	0438
	The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0439
	The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0440
	Clinical techniques for brachytherapy of head and neck tumors	0441
	Clinical trial of Vitex negundo tablet as antitussive	0442
	The clinical utility of gated spect in myocardial perfusion imaging	0443
	Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and 2	0444
	Community-based surveillance for drug resistance of mycobacterium tuberculosis in selected areas in the Philippines	0445
	Comparative effectiveness of an iron-fortified product with the sangkap pinoy seal and ferrous sulfate on the hemoglobin and hematocrit levels of five year old pre- school children at the Eskwelahang Munti Barangay Potrero, Malabon City	0446
	The comparative effects of purified fractions of <i>Vitex negundo L</i> . (lagundi) and crude extracts of <i>Cassia alata L</i> . (akapulko) and <i>Artemisia vulgaris L</i> . (damong maria) on inflammatory processes. <i>In vitro</i>	0447
	A comparative study on the treatment outcome of tuberculosis patients managed in a PPM-DOTS center by type of treatment partners	0448
	Comparative study on the use of fourth finger technique versus standard technique of intradermal injection of anti-rabies vaccine	0449
	Complementary alternative medicine usage among diabetic patients of Ospital ng	0450

Maynila Medical Center from January 2004 - June 2005	
Coronary-cameral fistula: a case report	0451
Cross-sectional study of the alcohol use among elderly patients seen in the Veterans Memorial Medical Center Medical Out-Patient Clinic using alcohol screening aid of the National Institute on Alcohol Abuse and Alcoholism	0452
Cultural diversity: the Filipino client providing culturally sensitive education on breast cancer and early screening	0453
Cultural Management and postharvest handling of lagundi (Vitex negundo L.)	0454
Cyclosporin analysis in blood by automated reserved-phase high performance liquid chromatographic method coupled with solid phase extraction and speed vacuum evaporation	0455
Dengue fever profile in the province of South Cotabato	0456
Determinants of compliance to therapeutic regimen among selected Filipino juvenile diabetics	0457
Diabetes and childbearing: exploring the options	0458
Dosimetry application of gate in prostate brachytherapy	0459
The effect of banana fruit ( <i>Musa sapientum</i> ) as adjunct to ranitidine in the management of uninvestigated dyspepsia	0460
The effect of individual versus group psychotherapy among grade six students with depression	0461
Effect of trimetazidine on left ventricular ejection fraction and time to develop 1mm ST depression in patients with chronic stable angina: a meta-analysis	0462
The effect of virgin coconut oil on the cholesterol levels of patients with hypercholesterolemia	0463
Effectiveness of group consensus activity in improving appropriateness of care for the management of adult asthmatic patients in the ambulatory care unit	0464
The effectiveness of the use of soybean powdered drink as supplement to lipid lowering agents vs. lipid lowering agents alone in hypercholesterolemia	0465
The effectiveness of thinber on weight reduction as an adjunct to low calorie diet prescription among adults: a randomized controlled study	0466
Evaluation and in-house validation of five DNA extraction methods for PCR-based STR analysis of bloodstained denims	0467
A family health care model for the implementation of mass annual treatment with diethylcarbamazine citrate for the elimination of filariasis in the Philippines	0468
Genetic methods for area-wide management of lepidopterous pests with emphasis on $F_1$ sterility	0469
Genetic polymorphism of CYP2D6*10 gene among Filipinos	0470
Growth patterns and infectivity of a dengue-2 virus strain propagated in the human myelomomocytic cell line K562	0471
Histomorphometry and osteoinductive growth factor levels of fracture callus versus	0472

iliac crest bone grafts

Hormonal contraception: an approach to the demographic crisis in the Philippines	0473
Hypertensive patients' symptoms distress and quality of life	0474
Impact of internet use on medical practice of FM residents and consultants in Davao City	0475
Impacts of a patient's death under a health provider's care	0476
Improving human fetal development: the super baby	0477
In vitro study on the bactericidal effects of freshly prepared colloidal silver	0478
Interleukin 4 -590 C/T gene polymorphism as a genetic marker for atopic asthma in a selected Filipino pediatric population	0479
International scientific productivity of selected universities in the Philippines	0480
Irradiated long bone transplants in limb saving surgeries for extremity bone cancers	0481
Isolation and identification of constituents from the antitubercular DCM fraction from the leaf extract <i>Premna odorata</i> blanco	0482
Mechanical, chemical and surgical methods of contraception	0483
Mechanism of H <sub>2</sub> S absorption using calcium-based sorbents under in-situ coal gasification conditions	0484
Modified caregiver strain index	0485
Modified fall risk assessment tool among elderly diagnosed with chronic disease	0486
Morbidity changes among smoking clients who consulted at Eastern Visayas Regional Medical Center Family Health Clinic from October 2003 - October 2004	0487
Multidrug-resistant esbls in common clinical isolates: first documentation of BLACTX-M genotype in the Philippines	0488
Multiplex PCR detection of <i>Mycobacterium tuberculosis</i> and characterization of mutations in katG and rpoB genes of resistant strains in Metro Manila	0489
Mutagenicity, clastogenicity and antimutagenicity of expressions, decoctions, tablet and syrup preparations from "lagundi" ( <i>Vitex negundo</i> L.)	0490
A new look at heterophyidiasis (intestinal fluke infection): a food-borne parasitic zoonosis in the Philippines	0491
Nutrition problems of the urban family	0492
Performance evaluation of tailor made microspheres as sensing layer responsive to residual chloramphenicol in food matrices	0493
Pharmacognostical studies on Vitex Negundo L.	0494
Pharmacologic and toxicologic studies on lagundi (Vitex negundo, L.)	0495
Phytochemical studies on the leaves of Vitex negundo L. (lagundi)	0496
Porous biphasic calcium phosphate ceramic for anopthalmic socket implant	0497
Practice patterns of physicians in the management of patients admitted for acute sinusitis in Chong Hua Hospital, January 2003 - June 2006	0498
Pranic healing as adjunct treatment in functional dyspepsia	0499

Predictors of poor compliance to medications among adult Filipino patients diagnosed with hypertension in selected provinces of the Philippines	0500
The prevalence of depression in the elderly at Area C, San Martin II, Sapang Palay, Del Monte Bulacan	0501
Probing the decisions behind induced abortion in the Philippines	0502
The relation of family function and adherence to tuberculosis treatment	0503
Resolving questioned paternity issues using a Philippine genetic database	0504
The rifasaf project: a case-control study on risk factors for stroke among Filipinos	0505
The role of radiation in tissue banking	0506
Sex preselection in animals: current methods and applications	0507
Single nucleotide polymorphism genotyping of antithrombotic therapy resistance markers using high resolution melt analysis	0508
Studies on Schistosomiasis japonica and Saponins	0509
Studies on the outer root bark of <i>Kokoona ochracea</i> (ELM) Merr. (family celastraceae)	0510
A study on the common superstitious health beliefs and practices among randomly selected pregnant women in Punta Engaño, Mactan, Cebu	0511
Women in health development: the Mangyans of Mindoro Province	0512
Megalurus	
DNA barcoding of birds in the University of the Philippines, Diliman Campus, with emphasis on striated grassbirds <i>Megalurus palustris</i>	0159
Megapodagrionidae	
Contribution to the taxonomy of Philippine megapodagrionidae (odonata:zygoptera)	0018
Megophryidae	
Distribution of anuran species in Loboc Watershed of Bohol Island, Philippines	0157
Meioidogyne graminicoia	
Alternative management strategies against the rice root-knot nematode, <i>Meioidogyne graminicoia</i> in rice-onion system	0003
Melena	
Dengue fever profile in the province of South Cotabato	0456
Membrane distillation (MD)	
Polymeric membranes for pressure-driven filtration	0268
Mentha arvensis	
Essential oil content and antibacterial activity of some Philippine plants	0251
Mentha spicata	
Essential oil content and antibacterial activity of some Philippine plants	0251
Mercury	
Arsenic and mercury concentrations of the waters and janitor fishes	0134

(Pterygoplichthys spp.) in the Marikina River, Philippines	
Comparison of pollen abortiveness in four weed species treated with mercuric chloride	0152
Mercury monitoring	
Total mercury in three fish species sold in a Metro Manila Public Market: monitoring and health risk assessment	0276
Mesocarp	
The fruit anatomy of <i>Moringa oleifera</i> Lam: a potential plant for healthy active ageing	0175
Mestizo	
Seed quality response to fungicide treatment of a line and F <sub>1</sub> hybrid seeds	0109
Mestizo 1	
Drying of mestizo 1 and mestizo 3 hybrid rice seeds	0035
Mestizo 3	
Drying of mestizo 1 and mestizo 3 hybrid rice seeds	0035
Metallic tumor implants	
Irradiated long bone transplants in limb saving surgeries for extremity bone cancers	0481
Metallophytes	
The Identification of metallophytes in the Fe and Cu enriched environments of Brookes Point, Palawan and Mankayan, Benguet and their Implications to Phytoremediation	0261
Metarhizium anisopliae	
Cuticle-degrading enzyme activity of <i>Metarhizium anisopliae</i> (METSCH.) Sorok. isolates pathogenic to asian corn borer larvae	0023
Meteorological variable	
An analysis of the precipitable water vapor observed over the PIMO GPS station	0514
Methanolic extracts	
Preliminary screening of methanolic extracts of kalingag ( <i>Cinnamomum mercadoi</i> Vindal) and Talisay ( <i>Terminalia catappa</i> ) against methicillin resistant Staphylococcus aureus (MRSA)	0217
Method validation	
Determination of <i>Trans</i> fatty acid in virgin coconut oil and other fats and oils by gas chromatography	0342
Method validation of plasma or serum retinol analysis using high performance liquid chromatography UV/VIS detection	0345
Methods of contraception	
Mechanical, chemical and surgical methods of contraception	0483
Methyl eugenol	
Essential oil content and chemical composition of Philippine Cinnamomum	0252

548
548
319
038
486
289
131
268
548
071
297
060
196
553
595
268

Distribution of anuran species in Loboc Watershed of Bohol Island, Philippines	0157
Micropropagation	
Tissue cultured avocado ( <i>Persea americana</i> MILLER): a journey from laboratory to field	0121
Microrheology	
High resolution probing of elastic properties of biopolymers and living cells	0566
Microsatellite	
Genetic diversity analysis of Philippine maize inbred lines using microsatellite markers	0053
Microscopic linear displacements	
Optical-feedback semiconductor laser Michelson interferometer	0561
Microsoft Fortran 4.10	
PUF_DOSE: a PC program to calculate doses from a puff release of radioactivity	0365
Microstructure	
Coconut fiber reinforced composite new technology approach to age-old solutions	0587
Microstructure of polyaniline	
Effect of dopant ions on the electrical conductivity and microstructure of polyaniline (emeraldine salt)	0246
Microvascular surgery	
Irradiated long bone transplants in limb saving surgeries for extremity bone cancers	0481
Microwave	
Calorimetric measurements of the output power of the 2.48 GHz commercial magnetron	0518
Initial studies of a microwave-induced atmospheric plasma jet	0540
Microwave-assisted cadogan reaction: its application to synthesis of heterocyclic compounds	0264
Microwave-assisted reaction	
Microwave-assisted reaction: a cleaner and efficient method for the synthesis of indazoles and benzimidazoles	0596
Milagrosa mutant	
Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)	0022
Milkfish	
Total mercury in three fish species sold in a Metro Manila Public Market: monitoring and health risk assessment	0276
Mindanao	
Diversity and status of plants in three mountain ecosystems in Southern Mindanao, Philippines	0314

Mine waste dump

Field growth responses of three tree species to mycorrhiza and fertilizers in the bioremediation of a mine waste dump	0351
Mineralization	
<i>In situ</i> compositing of rice straw using embased inoculant and chicken manure	0060
Microbial biomass as indicator of organic fertilizer mineralization in paddy soil	0071
Minimum detectable activity	
Minimum detectable activity of a 5x5 NaI T1) gamma spectrometer used for the radioactivity clearance measurements of the PRR-1 decommissioning project	0364
Minimum detectable concentrations	
Sensitivity of radiation monitoring systems in Manila Ports in detecting contamination in foodstuff shipments	0567
Minimum inhibitory concentration	
The antiseptic activity of <i>Psidium guajava</i> essential oil	0133
Mining	
Bioremediation: a proven and cost effective tool for repairing the environment	0145
Preliminary survey of mangrooves and pine forest of Masinloc, Zambales	0353
Mistichthys luzanensis Smith	
Managing 'Sinarapan' <i>Mistichthys luzonensis</i> Smith in Lake Buhi, Camarines Sur: (insights from its biology and population dynamics	0386
Mite pests	
A review and revised checklist of the mites (acari) in B.P. Gabriel's "insects and mites injurious to Philippine crop plants"	0104
Mites	
A review and revised checklist of the mites (acari) in B.P. Gabriel's "insects and mites injurious to Philippine crop plants"	0104
Mitochondrial cytochrome c oxidase I gene	
Morphometric analysis and DNA barcoding of fruit flies Bactroceraoccipitalis (Bezzi) and B. philippinensis drew and hancock (Diptera: Tephritidae) from Cavite and Davao del Norte	0201
Mitotic cell	
Preliminary cytogenetic characterization of the golden birdwing, <i>Troides</i> <i>rhadamantus</i> (Lucas) (Lepidoptera: Papilionidae)	0216
Mixed stands	
Silvical characteristics of pure and mixed stands in permanent field laboratory area (PFLA 3), Mt. Makiling Forest Reserve	0354
MMSU 95 hBE	
Properties and performance of MMSU hydrous biofuel	0598
MMSU hBE-20	

MN Frequency distribution of blood groups ABO, MN and Rh factor in Philippine 0174 cosmopolitan, regional, and the national populations Model simulation A model simulation of air pollution over Metro Manila 0319 Modified fall risk assessment tool Modified fall risk assessment tool among elderly diagnosed with chronic disease 0486 Modularity Modularity and integration in the forewing of the Philippine rice black bug 0197 (Scotinophara SPP. stål, hemiptera: pentatomidae) Modulus of elasticity (MOE) Utilization of acacia mangium for cement-bonded board manufacture 0123 Modulus of rupture (MOR) Utilization of acacia mangium for cement-bonded board manufacture 0123 Modulus of rupture (MOR) Utilization of acacia mangium for cement-bonded board manufacture 0123 Modulus of rupture (MOR) Utilization of acacia mangium for cement-bonded board manufacture 0123 Modulus of rupture (MOR) Utilization of acacia mangium for cement-bonded board manufacture 0123 Modulus of rupture (MOR) Utilization of acacia mangium for cement-bonded board manufacture 0123 Modulus of rupture (MOR) Utilization of acacia mangium for cement-bonded board manufacture 0123 Modulus of rupture (MOR) Utilization of acacia mangium for cement-bonded board manufacture 0123 Molecular beam epitaxy Electron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and 0529 Off-axis substrates Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular beam epitaxy Molecular diagnostics Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and 0444 2 Molecular marker Molecular and phenotypic studies of resistance genes introgressed from wild tomato 073 ( <i>Lycopersicon chilense</i> ) to cultivated tomato ( <i>Lycopersicon esculentum</i> ) against tomato leaf curl virus isolate from the Philippines Molecular sieve	Properties and performance of MMSU hydrous biofuel	0598
Frequency distribution of blood groups ABO, MN and Rh factor in Philippine cosmopolitan, regional, and the national populations0174Model simulationA model simulation of air pollution over Metro Manila0319Modified fall risk assessment toolModified fall risk assessment tool among elderly diagnosed with chronic disease0486ModularityModularity and integration in the forewing of the Philippine rice black bug (Scotinophara SPP. stål, hemiptera: pentatomidae)0197Modulus of elasticity (MOE)Utilization of acacia mangium for cement-bonded board manufacture0123Modulus of rupture (MOR)Utilization of acacia mangium for cement-bonded board manufacture0173Utilization of acacia mangium for cement-bonded board manufacture0173Moist chamber set-upsFour new records and one new species of Philippine myxomycetes from Hundred Islands and Anda Island, Pangasinan0529Molecular beam epitaxyElectron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Molecular beam epitaxy0529Molecular diagnostics Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and ( <i>Lycopersicon chilense</i> ) to cultivated tomato ( <i>Lycopersicon esculentum</i> ) against tomato leaf curl virus isolate from the Philippines0073Molecular marker Molecular sieveMolecular sieve0731	MN	
Model simulation0319A model simulation of air pollution over Metro Manila0319Modified fall risk assessment tool0486Modularity0486Modularity and integration in the forewing of the Philippine rice black bug (Scotinophara SPP. stål, hemiptera: pentatomidae)0197Modulus of elasticity (MOE)0197Utilization of acacia mangium for cement-bonded board manufacture0123Modulus of rupture (MOR)0123Utilization of acacia mangium for cement-bonded board manufacture0123Moist chamber set-ups10173Four new records and one new species of Philippine myxomycetes from Hundred Islands and Anda Island, Pangasinan0173Molecular beam epitaxyElectron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Off-axis substrates Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular diagnostics0536Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and ( <i>Lycopersicon chilense</i> ) to cultivated tomato ( <i>Lycopersicon esculentum</i> ) against tomato leaf curl virus isolate from the Philippines073	Frequency distribution of blood groups ABO, MN and Rh factor in Philippine cosmopolitan, regional, and the national populations	0174
A model simulation of air pollution over Metro Manila0319Modified fall risk assessment tool0486Modularity0197Modularity and integration in the forewing of the Philippine rice black bug (Scotinophara SPP. stål, hemiptera: pentatomidae)0197Modulus of elasticity (MOE)0123Utilization of acacia mangium for cement-bonded board manufacture0123Modulus of rupture (MOR)0123Utilization of acacia mangium for cement-bonded board manufacture0123Moist chamber set-ups0173Four new records and one new species of Philippine myxomycetes from Hundred Islands and Anda Island, Pangasinan0529Molecular beam epitaxy0197Electron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Off-axis substrates0529Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular diagnostics0536Molecular and phenotypic studies of resistance genes introgressed from wild tomato ( <i>Lycopersicon chilense</i> ) to cultivated tomato ( <i>Lycopersicon esculentum</i> ) against tomato leaf curl virus isolate from the Philippines0073	Model simulation	
Modified fall risk assessment tool       0486         Modularity       0486         Modularity and integration in the forewing of the Philippine rice black bug (Scotinophara SPP. stål, hemiptera: pentatomidae)       0197         Modulus of elasticity (MOE)       0123         Utilization of acacia mangium for cement-bonded board manufacture       0123         Modulus of rupture (MOR)       0123         Utilization of acacia mangium for cement-bonded board manufacture       0123         Moist chamber set-ups       0123         Four new records and one new species of Philippine myxomycetes from Hundred       0173         Islands and Anda Island, Pangasinan       01529         Off-axis substrates       0529         Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via       0536         molecular beam epitaxy       0536         Molecular diagnostics       0101         Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and       0444         2       0073         Molecular and phenotypic studies of resistance genes introgressed from wild tomato       0073         Molecular and phenotypic studies of resistance genes introgressed from wild tomato       0073         Molecular and phenotypic studies of resistance genes introgressed from wild tomato       0073         Molecular and phenot	A model simulation of air pollution over Metro Manila	0319
Modified fall risk assessment tool among elderly diagnosed with chronic disease0486ModularityModularity and integration in the forewing of the Philippine rice black bug (Scotinophara SPP. stål, hemiptera: pentatomidae)0197Modulus of elasticity (MOE)Utilization of acacia mangium for cement-bonded board manufacture0123Modulus of rupture (MOR)Utilization of acacia mangium for cement-bonded board manufacture0123Moist chamber set-upsFour new records and one new species of Philippine myxomycetes from Hundred0173Islands and Anda Island, Pangasinan01730173Molecular beam epitaxyElectron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Off-axis substrates0529Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular beam epitaxy0536Molecular diagnosticsCloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and 0444 20444Molecular and phenotypic studies of resistance genes introgressed from wild tomato ( <i>Lycopersicon chilense</i> ) to cultivated tomato ( <i>Lycopersicon esculentum</i> ) against tomato leaf curl virus isolate from the Philippines0073	Modified fall risk assessment tool	
Modularity0197Modularity and integration in the forewing of the Philippine rice black bug (Scotinophara SPP. stål, hemiptera: pentatomidae)0197Modulus of elasticity (MOE)0123Utilization of acacia mangium for cement-bonded board manufacture0123Modulus of rupture (MOR)0123Utilization of acacia mangium for cement-bonded board manufacture0123Moist chamber set-ups0123Four new records and one new species of Philippine myxomycetes from Hundred0173Islands and Anda Island, Pangasinan0173Molecular beam epitaxyElectron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Off-axis substrates0529Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular beam epitaxy0536Molecular diagnosticsCloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and Molecular marker Molecular and phenotypic studies of resistance genes introgressed from wild tomato (Lycopersicon chilense) to cultivated tomato (Lycopersicon esculentum) against tomato leaf curl virus isolate from the Philippines	Modified fall risk assessment tool among elderly diagnosed with chronic disease	0486
Modularity and integration in the forewing of the Philippine rice black bug (Scotinophara SPP. stål, hemiptera: pentatomidae)0197Modulus of elasticity (MOE) Utilization of acacia mangium for cement-bonded board manufacture0123Modulus of rupture (MOR) Utilization of acacia mangium for cement-bonded board manufacture0123Moist chamber set-ups Four new records and one new species of Philippine myxomycetes from Hundred Islands and Anda Island, Pangasinan0173Molecular beam epitaxy Electron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Off-axis substrates Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via nolecular beam epitaxy0536Molecular diagnostics Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and 0444 20444Molecular and phenotypic studies of resistance genes introgressed from wild tomato 0073 (Lycopersicon chilense) to cultivated tomato (Lycopersicon esculentum) against tomato leaf curl virus isolate from the Philippines0073	Modularity	
Modulus of elasticity (MOE)0123Utilization of acacia mangium for cement-bonded board manufacture0123Modulus of rupture (MOR)0123Utilization of acacia mangium for cement-bonded board manufacture0123Moist chamber set-upsFour new records and one new species of Philippine myxomycetes from Hundred0173Islands and Anda Island, Pangasinan0173Molecular beam epitaxyElectron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and0529Off-axis substrates0536Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular beam epitaxy0536Molecular diagnosticsCloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and04442Molecular markerMolecular and phenotypic studies of resistance genes introgressed from wild tomato0073(Lycopersicon chilense) to cultivated tomato (Lycopersicon esculentum) against tomato leaf curl virus isolate from the Philippines0073	Modularity and integration in the forewing of the Philippine rice black bug (Scotinophara SPP. stål, hemiptera: pentatomidae)	0197
Utilization of acacia mangium for cement-bonded board manufacture0123Modulus of rupture (MOR)Utilization of acacia mangium for cement-bonded board manufacture0123Moist chamber set-upsFour new records and one new species of Philippine myxomycetes from Hundred Islands and Anda Island, Pangasinan0173Molecular beam epitaxyElectron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Off-axis substrates0529Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular diagnostics0536Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and (Lycopersicon chilense) to cultivated tomato (Lycopersicon esculentum) against tomato leaf curl virus isolate from the Philippines0073Molecular sieve	Modulus of elasticity (MOE)	
Modulus of rupture (MOR)0123Utilization of acacia mangium for cement-bonded board manufacture0123Moist chamber set-upsFour new records and one new species of Philippine myxomycetes from Hundred Islands and Anda Island, Pangasinan0173Molecular beam epitaxyElectron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Off-axis substrates0529Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular beam epitaxy0536Molecular diagnostics Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and Molecular marker Molecular and phenotypic studies of resistance genes introgressed from wild tomato (Lycopersicon chilense) to cultivated tomato (Lycopersicon esculentum) against tomato leaf curl virus isolate from the Philippines0073	Utilization of acacia mangium for cement-bonded board manufacture	0123
Utilization of acacia mangium for cement-bonded board manufacture0123Moist chamber set-upsFour new records and one new species of Philippine myxomycetes from Hundred Islands and Anda Island, Pangasinan0173Molecular beam epitaxyElectron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Off-axis substrates Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular beam epitaxy0536Molecular diagnostics Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and (Lycopersicon chilense) to cultivated tomato (Lycopersicon esculentum) against tomato leaf curl virus isolate from the Philippines0073Molecular sieveMolecular sieveMolecular sieve	Modulus of rupture (MOR)	
Moist chamber set-ups0173Four new records and one new species of Philippine myxomycetes from Hundred0173Islands and Anda Island, Pangasinan0173Molecular beam epitaxyElectron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and0529Off-axis substratesGrowth of GaAs-based VCSEL/RCE structures for optoelectronic applications via0536molecular beam epitaxyMolecular diagnostics0536Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and04442Molecular markerMolecular and phenotypic studies of resistance genes introgressed from wild tomato0073(Lycopersicon chilense) to cultivated tomato (Lycopersicon esculentum) against tomato leaf curl virus isolate from the Philippines0073	Utilization of acacia mangium for cement-bonded board manufacture	0123
Four new records and one new species of Philippine myxomycetes from Hundred0173Islands and Anda Island, PangasinanMolecular beam epitaxyElectron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and0529Off-axis substratesGrowth of GaAs-based VCSEL/RCE structures for optoelectronic applications via0536molecular beam epitaxyMolecular diagnostics0510Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and04442Molecular markerMolecular and phenotypic studies of resistance genes introgressed from wild tomato0073(Lycopersicon chilense) to cultivated tomato (Lycopersicon esculentum) against tomato leaf curl virus isolate from the PhilippinesMolecular sieve	Moist chamber set-ups	
<ul> <li>Molecular beam epitaxy</li> <li>Electron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and 0529 Off-axis substrates</li> <li>Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via 0536 molecular beam epitaxy</li> <li>Molecular diagnostics</li> <li>Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and 0444 2</li> <li>Molecular marker</li> <li>Molecular and phenotypic studies of resistance genes introgressed from wild tomato 0073 (<i>Lycopersicon chilense</i>) to cultivated tomato (<i>Lycopersicon esculentum</i>) against tomato leaf curl virus isolate from the Philippines</li> </ul>	Four new records and one new species of Philippine myxomycetes from Hundred Islands and Anda Island, Pangasinan	0173
<ul> <li>Electron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and 0529 Off-axis substrates</li> <li>Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via 0536 molecular beam epitaxy</li> <li>Molecular diagnostics</li> <li>Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and 0444 2</li> <li>Molecular marker</li> <li>Molecular and phenotypic studies of resistance genes introgressed from wild tomato 0073 (<i>Lycopersicon chilense</i>) to cultivated tomato (<i>Lycopersicon esculentum</i>) against tomato leaf curl virus isolate from the Philippines</li> <li>Molecular sieve</li> </ul>	Molecular beam epitaxy	
<ul> <li>Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via 0536 molecular beam epitaxy</li> <li>Molecular diagnostics <ul> <li>Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and 0444 2</li> </ul> </li> <li>Molecular marker <ul> <li>Molecular and phenotypic studies of resistance genes introgressed from wild tomato 0073 (<i>Lycopersicon chilense</i>) to cultivated tomato (<i>Lycopersicon esculentum</i>) against tomato leaf curl virus isolate from the Philippines</li> </ul> </li> </ul>	Electron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Off-axis substrates	0529
<ul> <li>Molecular diagnostics</li> <li>Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and 0444 2</li> <li>Molecular marker</li> <li>Molecular and phenotypic studies of resistance genes introgressed from wild tomato 0073 (<i>Lycopersicon chilense</i>) to cultivated tomato (<i>Lycopersicon esculentum</i>) against tomato leaf curl virus isolate from the Philippines</li> <li>Molecular sieve</li> </ul>	Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular beam epitaxy	0536
Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and 0444 2 Molecular marker Molecular and phenotypic studies of resistance genes introgressed from wild tomato 0073 ( <i>Lycopersicon chilense</i> ) to cultivated tomato ( <i>Lycopersicon esculentum</i> ) against tomato leaf curl virus isolate from the Philippines Molecular sieve	Molecular diagnostics	
Molecular marker Molecular and phenotypic studies of resistance genes introgressed from wild tomato 0073 ( <i>Lycopersicon chilense</i> ) to cultivated tomato ( <i>Lycopersicon esculentum</i> ) against tomato leaf curl virus isolate from the Philippines Molecular sieve	Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and 2	0444
Molecular and phenotypic studies of resistance genes introgressed from wild tomato 0073 ( <i>Lycopersicon chilense</i> ) to cultivated tomato ( <i>Lycopersicon esculentum</i> ) against tomato leaf curl virus isolate from the Philippines Molecular sieve	Molecular marker	
Molecular sieve	Molecular and phenotypic studies of resistance genes introgressed from wild tomato ( <i>Lycopersicon chilense</i> ) to cultivated tomato ( <i>Lycopersicon esculentum</i> ) against tomato leaf curl virus isolate from the Philippines	0073
	Molecular sieve	
Characteristics of Pangasinan zeolite as a molecular sieve for bioethanol 0284	Characteristics of Pangasinan zeolite as a molecular sieve for bioethanol	0284
Molecular weight (Mu)	Molecular weight (Mu)	
Surface molecular aggregation states of monodisperse and polydisperse polystyrene 0309 films on scanning force microscope	Surface molecular aggregation states of monodisperse and polydisperse polystyrene films on scanning force microscope	0309
Molecularly imprinted microspheres	Molecularly imprinted microspheres	
Performance evaluation of tailor made microspheres as sensing layer responsive to 0493 residual chloramphenicol in food matrices	Performance evaluation of tailor made microspheres as sensing layer responsive to residual chloramphenicol in food matrices	0493
Molluscicides	Molluscicides	

Potential effects of commercial molluscicides used in controlling golden apple snails of the native snail <i>Vivipara costata</i> (Quoy & Gaimard)	0092
Molybdenum (Mo)	
Thin film formation of gallium nitride using plasma-sputter deposition technique	0581
Molybdenum substrates	
The effect of deposition time on textured magnesium diboride thick films fabricated by electrophoretic deposition	0289
Monitor	
Design and development of smart karwats: a GSM based car security system with GPS tracking capability	0285
Monobactam	
Multidrug-resistant esbls in common clinical isolates: first documentation of BLACTX-M genotype in the Philippines	0488
Monochromator	
Femtosecond pulse propagation in a highly nonlinear photonic crystal fiber	0532
Monocrotophos	
The fate of pesticides in rice paddy ecosystem using nuclear techniques	0049
Monte Carlo method	
Tempering and annealing in a verdier-stockmayer polymer	0576
Morbidity	
Morbidity changes among smoking clients who consulted at Eastern Visayas Regional Medical Center Family Health Clinic from October 2003 - October 2004	0487
Morphogenesis	
Halogen-free, imidazolium based ionic liquids for organic and inorganic syntheses	0593
Morphological differences	
Morphological differences in the shapes and venation of wings of selected dragonfly species	0200
Morphometry	
Geographic variation in vegetative and flower morphometry among populations of <i>Lilium philippinense</i> Baker (liliaceae), an endemic species in the Philippines	0179
Mortality	
Some aspects of the population biology of the green tiger prawn <i>Penaeus semisulcatus</i> (De Haan, 1844) from Pilar and Capiz Bays, Northern Panay, West Central Philippines	0135
High incidence of land snails mortality at Mt. Arayat, Pampanga: an evidence of global warming	0061
Mosquito repellant	
Synthesis of glycerol-crosslinked poly(methylmethacrylate) microparticles for the controlled delivery of mosquito repellent	0275

Mossbauer spectroscopy	
Synthesis and characterization of $A1^{+3}$ doped $R_3Fe_{5-x}A1_xO_{12}$ (R=Dy and Y) iron garnets	0574
Motherless cases	
Resolving questioned paternity issues using a Philippine genetic database	0504
Motorized wheelchair	
Speech recognition controller for motorized wheelchair	0307
Mount Arayat	
A checklist of the rhopalocera (lepidoptera) of Mount Arayat, Pampanga, Philippines	0013
Mount Banahao de Lucban	
A taxonomic list of butterflies (lepidoptera:papilionoidea and hesperioidea) from Mount Banahao de Lucban, Quezon Province, Philippines	0118
Mouse embryos	
<i>In vivo</i> toxicology assessment of sytematically introduced functionalized nanoparticles in mice	0184
MPAs,	
Ecology and genetic structure of giant clams around Savu Sea, East Nusa Tenggara Province, Indonesia	0160
MRSA and streptomyces	
Optimization of fermentation medium for the production of bioactive compound by <i>Streptomyces sp.</i>	0207
Mt. Arayat	
High incidence of land snails mortality at Mt. Arayat, Pampanga: an evidence of global warming	0061
Mt. Kimangkil, Bukidnon	
Genetic variability within the population of the vulnerable Mindanao endemic Blue- Capped Kingfisher ( <i>Actenoides hombroni</i> ) using polymorphic DNA markers	0178
Mt. Makiling, Laguna, Philippines	
A survey of the rhopalocera (lepidoptera) of Mt. Makiling, Laguna, Philippines	0115
MTT	
Evaluation of the potency of generic anticancer drugs against various human tumor cell lines using <i>in-vitro</i> cell-based assay and parallel line assay	0168
Mucolytics	
Practice patterns of physicians in the management of patients admitted for acute sinusitis in Chong Hua Hospital, January 2003 - June 2006	0498
Mucopolysaccharides	
Development of biochemical procedures for the diagnosis of genetic disorders	0155
Mulberry	

Cocoon yield and quality of silkworm fed with leaves harvested from mulberry grown under conventional, LEISA, and organic agro-ecosystem manipulations	0015
Multi drugresistant Enterococcus	
Phenotypic distinction of enterobacterial flora of houseflies (Musca domestica L.)	0209
Multi-drug resistance	
Multiplex PCR detection of <i>Mycobacterium tuberculosis</i> and characterization of mutations in katG and rpoB genes of resistant strains in Metro Manila	0489
Multi-nutrient N-P-K-CI-S-B fertilizer	
Coconut yield and profitability under two practical fertilizer options: common salt (sodium chloride) and multi-nutrient 14N-5P2O5-20K2O- 15CI-4.5S-0.02B applications on bearing trees (technology notes)	0014
Multiplex PCR	
Multiplex PCR detection of <i>Mycobacterium tuberculosis</i> and characterization of mutations in katG and rpoB genes of resistant strains in Metro Manila	0489
Multiplex PCR (mPCR)	
Multiplex polymerase chain reaction for simultaneous detection of major mastitis- causing pathogens in buffalo milk	0074
Mungbean	
Co-inoculation of mungbean with rhizobia and plant growth promoting rhizobacteria (PGPR) improves nodulation, dry matter yield and nitrogen uptake	0016
Mungbean farming	
A descriptive model of cropping decision making application to crop diversification in irrigated rice farms	0026
Mungo (Phaseolus radiatus L.)	
Mutation frequency in mungo ( <i>Phaseolus radiatus</i> L.) after treatment with an alkylating chemical mutagen	0238
Musa sapientum	
The effect of banana fruit ( <i>Musa sapientum</i> ) as adjunct to ranitidine in the management of uninvestigated dyspepsia	0460
Musa sp.	
Banana root endophytes: potential biocontrol agents for vascular wilt disease	0139
Mushroom nutriceuticals	
Wild genetic useful mushroom resources of Central Luzon, as sources of nutriceuticals	0127
Mutagenesis	
Environmental mutagenesis, soil studies	0250
Mutant induction	
Tissue cultured avocado ( <i>Persea americana</i> MILLER): a journey from laboratory to field	0121

Mutant variety	
PNRI mutant variety: Cordyline 'Afable'	0091
Mutation induction	
PNRI mutant variety: Cordyline 'Afable'	0091
Muyong	
Muyong: an indigenous sustainable forest management system	0075
Mycobacterium tuberculosis	
The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0439
Community-based surveillance for drug resistance of mycobacterium tuberculosis in selected areas in the Philippines	0445
Mycobacterium tuberculosis H37Rv	
Isolation and identification of constituents from the antitubercular DCM fraction from the leaf extract <i>Premna odorata</i> blanco	0482
Mycorrhiza	
Field growth responses of three tree species to mycorrhiza and fertilizers in the bioremediation of a mine waste dump	0351
Mycosis	
Development and incidence of <i>Neozygites fresenii</i> (Nowakowski) remaudiere & Keller (Zygomycetes: Entomophthorales) in aphis craccivora koch and its pathogenicity to three other aphididae (Hemiptera)	0029
Myelomonocytic cell	
Growth patterns and infectivity of a dengue-2 virus strain propagated in the human myelomomocytic cell line K562	0471
Mykovam	
Effect of mykovam, beneficial indigenous microbes and compost for improved growth of <i>Terminalia catappa</i> in an acidic infertile soil	0161
Myocardial infarction (MI)	
The rifasaf project: a case-control study on risk factors for stroke among Filipinos	0505
Myocardial perfusion	
The clinical utility of gated spect in myocardial perfusion imaging	0443
Myxomycetes	
Four new records and one new species of Philippine myxomycetes from Hundred Islands and Anda Island, Pangasinan	0173
Occurrence of corticolous myxomycetes from acacia trees (Samanea samans Merr) collected from different sites in Luzon Island, Philippines	0205
n-butyl acrylate (nBA)	
Radiation-modified natural polymers for biomedical applications	0564

n-methyl-3,4-methylenedioxymethamphetamine (MDMA)	
Analysis of ecstasy in human urine by high performance liquid chromatography	0433
N-nitrosopyrrolidine	
Mutagenicity, clastogenicity and antimutagenicity of expressions, decoctions, tablet and syrup preparations from "lagundi" ( <i>Vitex negundo</i> L.)	0490
n-type silicon	
Rectifying behavior of PPy/n-Si heterojunctions	0565
NaI detectors	
Minimum detectable activity of a 5x5 NaI T1) gamma spectrometer used for the radioactivity clearance measurements of the PRR-1 decommissioning project	0364
Nail-head pull through (NHPT)	
Utilization of acacia mangium for cement-bonded board manufacture	0123
Nanocrystal	
Effect of functional iron oxide nanocrystals on the arsenic level in drinking water	0247
Nanomagnet	
Effect of functional iron oxide nanocrystals on the arsenic level in drinking water	0247
Nanoparticle	
Nanoparticle dispersions in carrageenan films	0266
Nanoparticles	
Fabrication of chitosan micron and submicron particles for drug sequestration	0255
<i>In vivo</i> toxicology assessment of sytematically introduced functionalized nanoparticles in mice	0184
Synthesis of glycerol-crosslinked poly(methylmethacrylate) microparticles for the controlled delivery of mosquito repellent	0275
nanowire	
Nanowire formation and polymer conformations of electropolymerized poly(3,4,- ethylenedioxythiophene) (PEDOT) on iodine-modified Au(111) single crystal electrode as probed by <i>in-situ</i> STM	0298
Nanowires	
Fabrication of anodic alumina oxide templates and their use for the electrosynthesis of polythiophene nanowires	0254
National cooperative trial	
Development of improved varieties of mungbean (NSIC Mg14 and NSIC mg15)	0032
National FMD task force	
Exploring the use of theater as an intervention tool for FMD control	0046
FMD information management system as a disease surveillance tool in FMD control and eradication program in the Philippines	0052
National seed industry council	

Development of improved varieties of mungbean (NSIC Mg14 and NSIC mg15)	0032
National Tobacco Administration	
Technologies for profitable tobacco production	0119
Native goats	
Geographical distribution and frequency of albumin, transferrin, and $\alpha$ -2 microglobulin alleles among anglo nubian, native goats and their F <sub>1</sub> crosses	0054
Native snail	
Potential effects of commercial molluscicides used in controlling golden apple snails of the native snail <i>Vivipara costata</i> (Quoy & Gaimard)	0092
Natural assets	
Spill-over effects of rural industrialization on community transformation	0322
Natural resource management strategies (NRMS)	
Eliciting indigenous knowledge system on natural resource management strategies: a case study in the cordillera region, Philippines	0602
Natural resources management	
Growth performance and yield of selected strain (gift) nile tilapia ( <i>Oreochromis niloticus</i> L.) in lowland irrigated ricefields integrated with azolla and mallard duck	0055
Natural tree fall gaps	
Effects of forest gaps on foliage insect diversity in the perment field laboratory areas (PFLAS)in Mt. Makiling Forest Reserve	0350
Nature	
The international and local scene in food irradiation and its relevance to future directions for food irradiation in the Philippines	0064
Nature vs. nature	
Philippine social science in the century of biology engaging the biological dimensions of behavioral and social phenomena	0210
Navicula	
A checklist of Navicula (Class Bacillariophyceae) of the Philippines	0149
Nd:YAG	
A Nd:YAG laser-pumped hydrogen raman shifter with capillary waveguide	0552
Temporal coherence behavior of a Nd:YAG pumped waveguide raman shifter	0577
Nd:YAG laser	
Broadband continuum generation in single-mode optical fiber	0517
Time-of-flight measurement of a 355-nm Nd:YAG laser-produced aluminum plasma	0583
Negros	
The avifauna of Mt. Haponhaponon, Mantikil, Siaton, Negros Oriental: with notes on other vertebrates	0312

Neighbor joining

Morphometric analysis and DNA barcoding of fruit flies Bactroceraoccipitalis (Bezzi) and B. philippinensis drew and hancock (Diptera: Tephritidae) from Cavite and Davao del Norte	0201
Nematode	
Alternative management strategies against the rice root-knot nematode, Meioidogyne graminicoia in rice-onion system	0003
Neobrettus nangalisagus n. sp.	
A new species of dried banana leaf spider, <i>Neobrettus</i> wanless 1984 (Araneae: Salticidae) from the agricultural lowlands of Mt. Banahaw, Quezon Province, Philippines	0078
Neozygites fresenii	
Development and incidence of <i>Neozygites fresenii</i> (Nowakowski) remaudiere & Keller (Zygomycetes: Entomophthorales) in aphis craccivora koch and its pathogenicity to three other aphididae (Hemiptera)	0029
Two <i>Neozygites</i> species (Zygomycetes: Entomophthorales) infecting aphids and mealybugs on Leyte Island	0076
Neozygites fumosa	
Two <i>Neozygites</i> species (Zygomycetes: Entomophthorales) infecting aphids and mealybugs on Leyte Island	0076
Nephotettix virescens	
Cellular and karyological variations in populations of green leafhopper <i>Nephotettix virescens</i> (distant) in the Philippines	0147
Networks	
Free radical synthesis of endfunctionalized polymers	0259
Tracking the dynamic variations in a social network formed through shared interests	0584
Neural network	
Physical quality characterization of milled rice using computer vision technique	0300
New genus	
A new genus, two new species and a new subspecies of Philippine Ants (Hymenoptera: Formicidae)	0203
New species	
A new genus, two new species and a new subspecies of Philippine Ants (Hymenoptera: Formicidae)	0203
New subspecies	
A new genus, two new species and a new subspecies of Philippine Ants (Hymenoptera: Formicidae)	0203
Nickel	
The reduction Behavior of nickel in high-iron laterites under $CO/CO_2/N_2$	0304

atmospheres

Nilaparvata lugens	
Antigonadotropic effects of precocene II: allaticidal action in females of Nilaparvata lugens (Stal)	0608
Nile tilapia	
Growth performance and yield of selected strain (gift) nile tilapia ( <i>Oreochromis niloticus</i> L.) in lowland irrigated ricefields integrated with azolla and mallard duck	0055
Nipa	
Is nipa farming feasible	0081
Nipa farming	
Is nipa farming feasible	0081
Nipaecoccus nipae	
Invasion of the buff coconut mealybug ( <i>Nipaecoccus nipae</i> ) in U.P. Los Baños campus, elucidation of the confounded "mealybug burn" damage and practical control	0065
Nitrate	
Effect of pretreatment on the structure and catalytic properties of rice hull-derived zeolites	0040
Nitric acid	
Effect of dopant ions on the electrical conductivity and microstructure of polyaniline (emeraldine salt)	0246
Nitrite	
Preliminary results on the use of clay to control <i>Pyrodinium</i> bloom: a mitigation strategy	0392
Nitrogen	
Butterfly manure: a novel source of bio-organic fertilizer	0011
Creating a master plan for coconut sap sugar	0021
Nitrogen uptake	
Co-inoculation of mungbean with rhizobia and plant growth promoting rhizobacteria (PGPR) improves nodulation, dry matter yield and nitrogen uptake	0016
No de novo synthesis	
Use of enriched live prey in promoting growth and maturation of tiger shrimp ( <i>Penaeus monodon</i> )	0341
Nodulation	
Co-inoculation of mungbean with rhizobia and plant growth promoting rhizobacteria (PGPR) improves nodulation, dry matter yield and nitrogen uptake	0016
Non-coherent	
Effects of noise coherence on stochastic resonance enhancement in a bithreshold system	0291

Non-equilibrium phase transition	
Derivation of third order MHD equations	0519
Non-equilibrium phenomena	
High resolution probing of elastic properties of biopolymers and living cells	0566
Non-host	
Alternative management strategies against the rice root-knot nematode, <i>Meioidogyne graminicoia</i> in rice-onion system	0003
Non-isomorphic	
Symmetric designs from a rahilly family of pre-difference sets of orders 2 and 3	0423
Non-isothermal crystallization	
Kinetics of non-isothermal crystallization of coconut-based cholesteryl ester: avrami and ozawa approaches	0542
Non-structural protein 1	
Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and 2	0444
Nonlinear eigenvalue	
Symmetry reductions and a posteriori finite element error estimators for bifurcation problems	0424
Nonsingular graph	
Regular singular and nonsingular graphs of arbitrarily large order exist	0419
Nopalea cochinellifera	
Cactus: nature's phytochemical specialist	0012
Norketamine	
Chromatographic analysis of ketamine and norketamine in human plasma and urine samples	0437
NSIC Rc166H (Mestizo 10)	
2 more private rice hybrids for wider farmers' choice	0001
NSIC Rc168H (Mestizo 11)	
2 more private rice hybrids for wider farmers' choice	0001
Nuclear fragmentation	
A Monte Carlo simulation study on the interactions of proton, 7Li and 12C with water for hadron therapy application	0549
Nuclear methodologies	
Isotope and geochemical methods in water resources assessment and environmental management	0541
Nuclear power	
Nuclear science and technology: perspectives and prospects for Philippine development	0554

Nuclear science and technology

Effect of training on attitude formation towards nuclear science and technology	0527
Nuclear training	
Effect of training on attitude formation towards nuclear science and technology	0527
Nucleonic gauges	
Nucleonic gauges in Philippine industry: current application	0377
Number of species	
The shallow water marine sponges (Porifera) of Cebu, Philippines	0398
Numerical modeling	
A model simulation of air pollution over Metro Manila	0319
Nutrition	
Emerging swine production technologies to keep pace with increasing population	0044
Nutritional status	
An Assessment of the selenium status of iodine-deficient and non-iodine deficient Filipino children	0434
Nutritional supplement	
A possible role of peptides in the growth enhancement of an industrial strain of <i>Saccharomyces</i> sp.	0215
Nypa friticans	
Is nipa farming feasible	0081
Obrimini	
A new species of stick insect (Phasmatodea: Heteropterygidae: Obriminae: Obrimini) from Cebu Island, Philippines	0079
Occupational exposure in mines	
Occupational exposure to radon in non-uranium underground mines in the Philippines	0557
Occurence	
Influence of boron-potassium fertilizer application on the occurrence of cracking in carrots ( <i>Daucus carrota</i> Linn)	0063
Odonata	
An annotated checklist of the dragonflies of Cebu Island, the Philippines with notes on conservation	0607
Contribution to the taxonomy of Philippine megapodagrionidae (odonata:zygoptera)	0018
Oedogonium spp.	
Food and feeding habits of Synodontis nigrita from the Osun River, SW Nigeria	0172
Oil	
MMSU produces 2 million Jatropha seedlings for PNOC-AFC	0072
OLED	

Preparation and investigation of spin self assembled multilayer film of poly(3,4 ethylenedioxythiophene): poly(4 styrenesulfonate) and poly(alylamine hydrochloride) as organic light-emitting diode	0302
Oleic acid	
Effect of functional iron oxide nanocrystals on the arsenic level in drinking water	0247
Oligomers	
Free radical synthesis of endfunctionalized polymers	0259
Oligonucleotide	
CpG oligodeoxynucleotides as immunomodulators of rBlo t 5-induced allergic reactions	0153
Oliphant solution	
Survival of boar spermatozoa intended for <i>In vitro</i> fertilization (IVF) following different speed, duration and frequency of sperm washing	0116
Omega 3	
Marine copepods: a potential rich source of omega-3 polyunsaturated fatty acids, a dietary supplement for healthy aging	0373
Oncomelania quadrasi	
Studies on Schistosomiasis japonica and Saponins	0509
One town one product	
Microbial load assessment of some "one town one product (otap)" food products of Ilocos Norte	0196
One-dimensional	
Dipolar interaction in a one-dimensional ising ring	0522
One-dimensional gravitational gas	
Numerical investigation of non-homologous collapse of the one-dimensional gravitational gas	0555
Thermodynamics of a one-dimensional gravitational gas in a uniform external field	0580
One-photon optical-beam-induced current (I POBIC)	
Localization and imaging of integrated circuit defect using simple optical feedback detection	0544
Onion	
Alternative management strategies against the rice root-knot nematode, <i>Meioidogyne graminicoia</i> in rice-onion system	0003
Damage assessment of lepidopterous pests of onion in Nueva Ecija	0024
Onion growing	
A descriptive model of cropping decision making application to crop diversification in irrigated rice farms	0026
Open-circuit potential	
Electrochemical synthesis and corrosion performance of polypyrrole and	0590

poly(pyrrole-co-aniline) films on copper	
Optical beam	
High-resolution differential thermography of semiconductor edifices	0538
Optical fiber	
Broadband continuum generation in single-mode optical fiber	0517
An optical remote sensing system based on molecular absorption spectroscopy: I. optical arrangement	0560
Optical-feedback semiconductor laser Michelson interferometer	
Optical-feedback semiconductor laser Michelson interferometer	0561
Optimization	
Initial studies of a microwave-induced atmospheric plasma jet	0540
Optoelectronic applications	
Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular beam epitaxy	0536
Orchid pest	
Biology of the orchid weevil, Orchidophilus aterrimus (waterhouse)	0143
Orchid weevil	
Biology of the orchid weevil, Orchidophilus aterrimus (waterhouse)	0143
Orchidophilus aterrimus	
Biology of the orchid weevil, Orchidophilus aterrimus (waterhouse)	0143
Oreochromis mossambicus	
The status of tilapia aquaculture in Lake Sebu, South Cotabato	0337
Organic extraction	
A possible role of peptides in the growth enhancement of an industrial strain of <i>Saccharomyces</i> sp.	0215
Organic fertilizer	
Adaptability and management of vegetables legumes and cereals in ashfall and lahar areas	0002
Development of electronically controlled environment for the fast decomposition of organic fertilizer	0286
Microbial biomass as indicator of organic fertilizer mineralization in paddy soil	0071
Organic rice farming	
Organic rice farming in Northeastern Thailand: an assessment of farmers' practices	0084
Organlc extracts	
Environmental mutagenesis, soil studies	0250
Ornamental plant	
PNRI mutant variety: Cordyline 'Afable'	0091
Ornaments	

Rediscovering job's tears	0220
Ornithology	
The avifauna of Mt. Haponhaponon, Mantikil, Siaton, Negros Oriental: with notes on other vertebrates	0312
Orysa sativa L.	
The application of molecular marker-assisted selection in rice breeding	0006
Ostrinia furnacalis	
Cuticle-degrading enzyme activity of <i>Metarhizium anisopliae</i> (METSCH.) Sorok. isolates pathogenic to asian corn borer larvae	0023
Survey of alternate host plants of the Asian corn borer <i>Ostrinia furnacalis</i> (Guenee): maramais Trypsacum laxum, in Pangasinan	0114
Outline analysis	
Outline analysis of wing shape variations in four species of damselflies collected from a stream and waterfalls in Iligan City	0208
Oxidative stress	
Lipid peroxidation and patterns of cadmium and lead accumulation in the vital organs of suckermouth armored catfish <i>Pterygoplichthys pardalis</i> castelnau from Marikina River	0190
Oxygen-18	
Environmental isotope techniques in the lake-aquifer interaction between Laguna Lake and the aquifer in the south sector of Metro Manila	0317
Ozawa approach	
Kinetics of non-isothermal crystallization of coconut-based cholesteryl ester: avrami and ozawa approaches	0542
P-I-N diode	
Observation of the quantum-confined stark effect in a GaAs/A1GaAs P-I-N Diode by room temperature photocurrent spectroscopy	0556
p-n junction	
Influence of stacked Ge islands on the dark current-voltage characteristics of a diode for solar cell application	0539
p-type conductive polymer polypyrrole	
Rectifying behavior of PPy/n-Si heterojunctions	0565
P. gabrieli	
<i>Phacopteron gabrieli</i> , a new psylloid (Hemiptera: Psylloidea: Phacopteronidae) from Mount Makiling, Luzon Island, Philippines	0087
P. maculipennis	
The <i>Paurocephala psylloptera</i> -complex (Hemiptera: Psylloidea: Aphalaridae) in the Philippines with description of a new species	0085

P. psylloptera

The *Paurocephala psylloptera*-complex (Hemiptera: Psylloidea: Aphalaridae) in the 0085 Philippines with description of a new species

P. sanchezi n. sp.

The *Paurocephala psylloptera*-complex (Hemiptera: Psylloidea: Aphalaridae) in the 0085 Philippines with description of a new species

P. setifera

The *Paurocephala psylloptera*-complex (Hemiptera: Psylloidea: Aphalaridae) in the 0085 Philippines with description of a new species

P2Y12 platelet receptor

Single nucleotide polymorphism genotyping of antithrombotic therapy resistance 0508 markers using high resolution melt analysis

P450

Single nucleotide polymorphism genotyping of antithrombotic therapy resistance 0508 markers using high resolution melt analysis

Padal fishing

Padal fishing: a unique fishing method in the Ashtamudi estuary of Kerala (South 0332 India)

Paddy rice soils

In situ compositing of rice straw using embased inoculant and chicken manure	0060
Paddy soils	
Microbial biomass as indicator of organic fertilizer mineralization in paddy soil	0071
Palawan, Philippines	
Focal benthic mollusks (Mollusca: Bivalvia and Gastropoda) of selected sites in	0384
Tubbataha Reef National Marine Park, Palawan, Philippines	

Paleo-sea level

Compaction rates and paleo-sea levels along the delta complex north of Manila	0359
Bay, Luzon Island, Philippines	

Palicourein

Molecular investigation of cyclotides in Rubiaceae and Cucurbitaceae	0199
Panulirus longipes longipes	
Survivorship and growth performance of red spiny lobster <i>Panulirus longings</i>	0338

Survivorship and growth performance of red spiny lobster *Panulirus longipes* 0338 *longipes* reared in floating netcages fed with *Sardinella* spp at different feeding rates

Paper disk diffusion assay

Fruticose lichens from selected sites in Luzon as sources of biologically active 0176 lichen acids

Parabolic equation

On the radiality assumption for existence and blowing up	0428
Paragonimus	

The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in       0440         Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and       0440         Paragonniasis       0440         Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and       0440         Paragonniasis       0440         Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and       0440         Parameters       Experimental verification of the allelomimesis clustering model       0531         Onset of small-world behavior in topologically evolving networks       0558         State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City,       0323         Palawan       0       0422         On sufficient condition for the existence of imaginary roots of a cubic polynomial       0422         equation       Parasitic crustaceans       Parasitic crustaceans         Parasitoid       0       0142         Biological studies of <i>Aphytis</i> sp. nr. <i>chrysomphali</i> (Hymenoptera: Aphelinidae)       0142         Parasitoids       0       022         Research Institute (PNRI)       022       Research Institute (PNRI)         Participatory extension       0022       Research Institute (PNRI)         Participatory GIS       Google carth: a tool for cliciting spatial information	The clinical epidemiology of pulmonary paragonimiasis and tuberculosis ir Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis a tuberculosis in Sorsogon, Philippines	า เnd	0439
Paragonmiasis0440The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines0440ParametersExperimental verification of the allelomimesis clustering model0531Onset of small-world behavior in topologically evolving networks0558State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan0422On sufficient condition for the existence of imaginary roots of a cubic polynomial equation0422Parasitic crustaceans9429Parasitic crustaceans in fishes from some Philippine lakes0390ParasitoidBiological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)0142ParasitoidsTechnology transfer of Cotesia-based IPM for diamondback moth on lowland elevation crucifers in Luzon0120PARC 2Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)0022Participatory extension Comparative analysis of coffee farming practices introduced by government and the local people0017Participatory GIS Google earth: a tool for eliciting spatial information about forest degradation from 	The clinical epidemiology of pulmonary paragonimiasis and tuberculosis ir Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis a tuberculosis in Sorsogon, Philippines	1 and	0440
The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines0440ParametersExperimental verification of the allelomimesis clustering model0531Onset of small-world behavior in topologically evolving networks0558State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City,0323Palawan0On sufficient condition for the existence of imaginary roots of a cubic polynomial equation0422Parasitic crustaceans9Parasitic crustaceans in fishes from some Philippine lakes0390Parasitoid8Biological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)0142Parasitoids0120elevation crucifers in Luzon022PARC 20022Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)0022Participatory GIS Google earth: a tool for eliciting spatial information about forest degradation from local people0592Particeboard A research on the production of bonded particle board utilizing sugarcane bagasse Particleboard0305Particleboard Production of particleboard from Nymphaea stellata willd (water lily) fiber with 	Paragonmiasis		
ParametersExperimental verification of the allelomimesis clustering model0531Onset of small-world behavior in topologically evolving networks0558State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan0323On sufficient condition for the existence of imaginary roots of a cubic polynomial equation0422Parasitic crustaceans0390Parasitic crustaceans in fishes from some Philippine lakes0390Parasitoid142Biological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)0142Parasitoid120Parasitoid120Parasito crucifers in Luzon022PARC 2Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)0022Participatory extension Comparative analysis of coffee farming practices introduced by government and the local people0017Participatory GIS Google earth: a tool for eliciting spatial information about forest degradation from local people0592ParticipatoryA research on the production of bonded particle board utilizing sugarcane bagasse0305Particleboard ParticleboardProduction of particleboard from Nymphaea stellata willd (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders0597	The clinical epidemiology of pulmonary paragonimiasis and tuberculosis ir Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis a tuberculosis in Sorsogon, Philippines	า ind	0440
Experimental verification of the allelomimesis clustering model0531Onset of small-world behavior in topologically evolving networks0558State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan0323On sufficient condition for the existence of imaginary roots of a cubic polynomial equation0422Parasitic crustaceans0422Parasitic crustaceans in fishes from some Philippine lakes0390Parasitoid0142Biological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)0142Parasitoids0120Technology transfer of Cotesia-based IPM for diamondback moth on lowland elevation crucifers in Luzon0120PARC 2Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)0022Participatory extension Comparative analysis of coffee farming practices introduced by government and the local people0592Particle board A research on the production of bonded particle board utilizing sugarcane bagasse0305Particleboard Production of particleboard from Nymphaea stellata willd (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders0597	Parameters		
Onset of small-world behavior in topologically evolving networks0558State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan0323On sufficient condition for the existence of imaginary roots of a cubic polynomial equation0422Parasitic crustaceans0422Parasitic crustaceans in fishes from some Philippine lakes0390Parasitoid0142Biological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)0142Parasitoids0120Technology transfer of Cotesia-based IPM for diamondback moth on lowland elevation crucifers in Luzon0120PARC 2Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)0022Participatory extension Comparative analysis of coffee farming practices introduced by government and the local people0592Participatory GIS Google earth: a tool for eliciting spatial information about forest degradation from local people0592Particle board A research on the production of bonded particle board utilizing sugarcane bagasse Production of particleboard from Nymphaea stellata willd (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders0597	Experimental verification of the allelomimesis clustering model		0531
State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan0323 PalawanOn sufficient condition for the existence of imaginary roots of a cubic polynomial equation0422 equationParasitic crustaceansParasitic crustaceans in fishes from some Philippine lakes0390Parasitic crustaceans in fishes from some Philippine lakes0390ParasitoidBiological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)0142ParasitoidsTechnology transfer of Cotesia-based IPM for diamondback moth on lowland elevation crucifers in Luzon0120PARC 2Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)0022Participatory extension Comparative analysis of coffee farming practices introduced by government and the private sectors in Paksong District, Champasak Province, Lao PDR0177Participatory GIS Google earth: a tool for eliciting spatial information about forest degradation from local people0592Particle board A research on the production of bonded particle board utilizing sugarcane bagasse Production of particleboard from Nymphaea stellata willd (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders0597	Onset of small-world behavior in topologically evolving networks		0558
On sufficient condition for the existence of imaginary roots of a cubic polynomial equation0422 equationParasitic crustaceansParasitic crustaceans0390Parasitic crustaceans in fishes from some Philippine lakes0390Parasitoid0142Biological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)0142Parasitoids0142Parasitoids0142Parasitoids0120elevation crucifers in Luzon0120PARC 2Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)0022Participatory extension0017Comparative analysis of coffee farming practices introduced by government and the private sectors in Paksong District, Champasak Province, Lao PDR01592Participatory GIS Google earth: a tool for eliciting spatial information about forest degradation from local people0592Particle board A research on the production of bonded particle board utilizing sugarcane bagasse Production of particleboard from Nymphaea stellata willd (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders0597	State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Prince Palawan	esa City,	0323
Parasitic crustaceans0390Parasitic crustaceans in fishes from some Philippine lakes0390ParasitoidBiological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)0142ParasitoidsTechnology transfer of Cotesia-based IPM for diamondback moth on lowland elevation crucifers in Luzon0120PARC 2Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)0022Participatory extension Comparative analysis of coffee farming practices introduced by government and the 	On sufficient condition for the existence of imaginary roots of a cubic poly equation	nomial	0422
Parasitic crustaceans in fishes from some Philippine lakes0390ParasitoidBiological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)0142ParasitoidsTechnology transfer of Cotesia-based IPM for diamondback moth on lowland elevation crucifers in Luzon0120PARC 2Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)0022Participatory extension Comparative analysis of coffee farming practices introduced by government and the private sectors in Paksong District, Champasak Province, Lao PDR0177Participatory GIS Google earth: a tool for eliciting spatial information about forest degradation from local people0592Particle board A research on the production of bonded particle board utilizing sugarcane bagasse0305Particleboard Production of particleboard from Nymphaea stellata willd (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders0597	Parasitic crustaceans		
Parasitoid0142Biological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)0142ParasitoidsTechnology transfer of Cotesia-based IPM for diamondback moth on lowland elevation crucifers in Luzon0120PARC 2Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)0022Participatory extension Comparative analysis of coffee farming practices introduced by government and the private sectors in Paksong District, Champasak Province, Lao PDR0017Participatory GIS Google earth: a tool for eliciting spatial information about forest degradation from local people0592Particle board A research on the production of bonded particle board utilizing sugarcane bagasse0305Particleboard high-density polyethylene (HDPE) and polystyrene (PS) as binders0597	Parasitic crustaceans in fishes from some Philippine lakes		0390
Biological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelinidae)0142ParasitoidsTechnology transfer of Cotesia-based IPM for diamondback moth on lowland elevation crucifers in Luzon0120PARC 2Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)0022Participatory extension Comparative analysis of coffee farming practices introduced by government and the private sectors in Paksong District, Champasak Province, Lao PDR0017Participatory GIS Google earth: a tool for eliciting spatial information about forest degradation from local people0592Particle board A research on the production of bonded particle board utilizing sugarcane bagasse Production of particleboard from Nymphaea stellata willd (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders0597	Parasitoid		
ParasitoidsTechnology transfer of Cotesia-based IPM for diamondback moth on lowland elevation crucifers in Luzon0120PARC 2Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)0022Participatory extension Comparative analysis of coffee farming practices introduced by government and the private sectors in Paksong District, Champasak Province, Lao PDR0017Participatory GIS Google earth: a tool for eliciting spatial information about forest degradation from local people0592Particle board A research on the production of bonded particle board utilizing sugarcane bagasse Production of particleboard from Nymphaea stellata willd (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders0597	Biological studies of Aphytis sp. nr. chrysomphali (Hymenoptera: Aphelini	dae)	0142
Technology transfer of Cotesia-based IPM for diamondback moth on lowland elevation crucifers in Luzon0120PARC 2Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)0022Participatory extension Comparative analysis of coffee farming practices introduced by government and the private sectors in Paksong District, Champasak Province, Lao PDR0017Participatory GIS Google earth: a tool for eliciting spatial information about forest degradation from local people0592Particle board A research on the production of bonded particle board utilizing sugarcane bagasse Production of particleboard from Nymphaea stellata willd (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders0597	Parasitoids		
<ul> <li>PARC 2</li> <li>Crop improvement through induced mutation breeding at the Philippine Nuclear Research Institute (PNRI)</li> <li>Participatory extension</li> <li>Comparative analysis of coffee farming practices introduced by government and the 0017 private sectors in Paksong District, Champasak Province, Lao PDR</li> <li>Participatory GIS</li> <li>Google earth: a tool for eliciting spatial information about forest degradation from 0592 local people</li> <li>Particle board</li> <li>A research on the production of bonded particle board utilizing sugarcane bagasse 0305</li> <li>Particleboard</li> <li>Production of particleboard from <i>Nymphaea stellata willd</i> (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders</li> </ul>	Technology transfer of <i>Cotesia</i> -based IPM for diamondback moth on lowla elevation crucifers in Luzon	and	0120
Crop improvement through induced mutation breeding at the Philippine Nuclear0022Research Institute (PNRI)Participatory extension0017Participatory extensionComparative analysis of coffee farming practices introduced by government and the0017Participatory GISGoogle earth: a tool for eliciting spatial information about forest degradation from0592Particle boardA research on the production of bonded particle board utilizing sugarcane bagasse0305ParticleboardProduction of particleboard from Nymphaea stellata willd (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders0597	PARC 2		
<ul> <li>Participatory extension</li> <li>Comparative analysis of coffee farming practices introduced by government and the 0017 private sectors in Paksong District, Champasak Province, Lao PDR</li> <li>Participatory GIS</li> <li>Google earth: a tool for eliciting spatial information about forest degradation from 0592 local people</li> <li>Particle board</li> <li>A research on the production of bonded particle board utilizing sugarcane bagasse 0305</li> <li>Particleboard</li> <li>Production of particleboard from <i>Nymphaea stellata willd</i> (water lily) fiber with 0597 high-density polyethylene (HDPE) and polystyrene (PS) as binders</li> </ul>	Crop improvement through induced mutation breeding at the Philippine Nu Research Institute (PNRI)	ıclear	0022
Comparative analysis of coffee farming practices introduced by government and the 0017 private sectors in Paksong District, Champasak Province, Lao PDR Participatory GIS Google earth: a tool for eliciting spatial information about forest degradation from 0592 local people Particle board A research on the production of bonded particle board utilizing sugarcane bagasse 0305 Particleboard Production of particleboard from <i>Nymphaea stellata willd</i> (water lily) fiber with 0597 high-density polyethylene (HDPE) and polystyrene (PS) as binders Partition function	Participatory extension		
<ul> <li>Participatory GIS</li> <li>Google earth: a tool for eliciting spatial information about forest degradation from 0592 local people</li> <li>Particle board</li> <li>A research on the production of bonded particle board utilizing sugarcane bagasse 0305</li> <li>Particleboard</li> <li>Production of particleboard from <i>Nymphaea stellata willd</i> (water lily) fiber with 0597 high-density polyethylene (HDPE) and polystyrene (PS) as binders</li> <li>Partition function</li> </ul>	Comparative analysis of coffee farming practices introduced by governmer private sectors in Paksong District, Champasak Province, Lao PDR	nt and the	0017
Google earth: a tool for eliciting spatial information about forest degradation from0592local peopleParticle boardParticle boardA research on the production of bonded particle board utilizing sugarcane bagasse0305ParticleboardProduction of particleboard from Nymphaea stellata willd (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders0597	Participatory GIS		
Particle board A research on the production of bonded particle board utilizing sugarcane bagasse0305Particleboard Production of particleboard from Nymphaea stellata willd (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders0597Partition function0597	Google earth: a tool for eliciting spatial information about forest degradation local people	on from	0592
A research on the production of bonded particle board utilizing sugarcane bagasse 0305 Particleboard Production of particleboard from <i>Nymphaea stellata willd</i> (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders Partition function	Particle board		
Particleboard Production of particleboard from <i>Nymphaea stellata willd</i> (water lily) fiber with 0597 high-density polyethylene (HDPE) and polystyrene (PS) as binders Partition function	A research on the production of bonded particle board utilizing sugarcane b	bagasse	0305
Production of particleboard from <i>Nymphaea stellata willd</i> (water lily) fiber with 0597 high-density polyethylene (HDPE) and polystyrene (PS) as binders Partition function	Particleboard		
Partition function	Production of particleboard from <i>Nymphaea stellata willd</i> (water lily) fiber high-density polyethylene (HDPE) and polystyrene (PS) as binders	with	0597
	Partition function		

Stretching single molecular DNA by temperature gradient: a white noise functiona approach	al 0570
Pasig river	
Microbial fuel cell: a new renewable source of energy: Pasig river sediments for lighting	0297
Salinity tolerance of introduced South American sailfin catfishes (Loricariidae: Pterygoplichthys GILL 1858)	0223
Paternity trios	
Resolving questioned paternity issues using a Philippine genetic database	0504
Patho-physiologic mechanism	
Chronic idiopathic urticaria (CIU), unveiled	0438
Pathogenicity	
Marine fungi from <i>Kappaphycus Alvarezii</i> and <i>K. Striatum</i> : potential causative agents of ice-ice disease in farmed seaweeds	0194
Paurocephala	
A new genus and species of aphalaridae (psylloidea, hemiptera) from Mount Makiling, Luzon Island, Philippines	0077
The <i>Paurocephala psylloptera</i> -complex (Hemiptera: Psylloidea: Aphalaridae) in t Philippines with description of a new species	he 0085
Pb and Cd bioaccumulation	
Lipid peroxidation and patterns of cadmium and lead accumulation in the vital organs of suckermouth armored catfish <i>Pterygoplichthys pardalis</i> castelnau from Marikina River	0190
Pb-21 0	
<sup>137</sup> Cs and <sup>210</sup> Pb distribution in Manila Bay sediment	0239
PCR	
Evaluation and in-house validation of five DNA extraction methods for PCR-base STR analysis of bloodstained denims	d 0467
Genetic variability within the population of the vulnerable Mindanao endemic Blu Capped Kingfisher ( <i>Actenoides hombroni</i> ) using polymorphic DNA markers	ie- 0178
Local Vibrio isolates exhibit molecular characteristics distinct from reference V. harveyi and V. campbellii strains	0191
PCR-RFLP	
Genetic polymorphism of CYP2D6*10 gene among Filipinos	0470
pCT	
Angular and lateral resolution study in pCT imaging involving biological tissues	0515
Pd	
Electrochemical synthesis and characterization of poly(3,4- ethylenedioxythiophene)-supported Pd-Sn nanoparticles dispersed on Au electrode	0248 e

for formic acid oxidation

Pd nanoparticles

Fabrication of electrocatalyst based on PEDOT-PSS supported Pd nanoparticles for 0256 ethanol electro-oxidation

Peak-to-entrance ratio

A Monte Carlo simulation study on the interactions of proton, 7Li and 12C with 0549 water for hadron therapy application

#### Peanut growing

A descriptive model of cropping decision making application to crop diversification 0026 in irrigated rice farms

Pediatric symptom checklist (PSC)

The effect of individual versus group psychotherapy among grade six students with 0461 depression

#### PEDOT

Preparation and investigation of spin self assembled multilayer film of poly(3,4 0302 ethylenedioxythiophene): poly(4 styrenesulfonate) and poly(alylamine hydrochloride) as organic light-emitting diode

## PEDOT-PSS

Fabrication of electrocatalyst based on PEDOT-PSS supported Pd nanoparticles for 0256 ethanol electro-oxidation

## Pegmattic

Zambales ophiolite complex mafic dikes in upper mantle rock suites: distinct short- 0367 lived island arc magmatisms

#### Penaeus monodon

Use of enriched live prey in promoting growth and maturation of tiger shrimp	0341
(Penaeus monodon)	

Penaeus semisulcafus

Some aspects of the population biology of the green tiger prawn *Penaeus* 0135 *semisulcatus* (De Haan, 1844) from Pilar and Capiz Bays, Northern Panay, West Central Philippines

## Peneaus monodon

Management of *Vibrio* infections in fishery industry by antibiotic susceptibility 0192 profiling

## Peptic ulcer disease

A new look at heterophyidiasis (intestinal fluke infection): a food-borne parasitic 0491 zoonosis in the Philippines

Peptides

A possible role of peptides in the growth enhancement of an industrial strain of *Saccharomyces* sp. 0215

Percentage similarity	
The shallow water marine sponges (Porifera) of Cebu, Philippines	0398
Perceptions	
Socio-economic conditions and perceptions on the conservation of Tubbataha Reefs and vicinity: a households survey in Cagayancillo, Palawan	0320
Perchloric acid	
Effect of dopant ions on the electrical conductivity and microstructure of polyaniline (emeraldine salt)	0246
Performance evaluation	
Development of a Beowulf-Class High Performance Computing System for Computational Science Applications	0604
Peri-urbanization	
Spill-over effects of rural industrialization on community transformation	0322
Pericarp	
An easy way to germinate sago palm seeds found	0038
The fruit anatomy of <i>Moringa oleifera</i> Lam: a potential plant for healthy active ageing	0175
Peridinium	
Abundance, composition and distribution of Phytoplankton in Calamianes, Palawan	0129
Persistence length	
Elastic properties of a biopolymer	0165
Pertubation approach	
A variational perturbation approach	0586
Perturbation theory	
Study of the perturbation to a bose-einstein gas	0571
Pervaporation (PV)	
Polymeric membranes for pressure-driven filtration	0268
Pest management advisory	
Pestnet: an inexpensive diagnostics and pest management advisory tool for crop protection practitioners in the Philippines	0086
PestNet	
Pestnet: an inexpensive diagnostics and pest management advisory tool for crop protection practitioners in the Philippines	0086
PGPR	
Co-inoculation of mungbean with rhizobia and plant growth promoting rhizobacteria (PGPR) improves nodulation, dry matter yield and nitrogen uptake	0016
pH	
Kinetics of iron in the development of rapid screening technique for iron toxicity	0066

tolerance in rice

Phacopteron	
<i>Phacopteron gabrieli</i> , a new psylloid (Hemiptera: Psylloidea: Phacopteronidae) from Mount Makiling, Luzon Island, Philippines	0087
Phacopteronidae	
<i>Phacopteron gabrieli</i> , a new psylloid (Hemiptera: Psylloidea: Phacopteronidae) from Mount Makiling, Luzon Island, Philippines	0087
Phase	
Structure and mechanical property of MgO-ZrO2 ceramic doped with CeO2	0308
Phase-shifting digital holographic interferometry (PSDHI)	
Measurement of three-dimensional deformations by phase-shifting digital holographic interferometry	0547
Phaseolus vulgaris L.	
The use of <i>Gus</i> -reporter gene technique in the assessment of the competitive ability of <i>Rhizobium etli</i> nodulating <i>Phaseolus vulgaris</i> L. from the acidic soils of La Trinidad, Benguet, Philippines	0233
Phasmatodea	
A new genus and species of stick insect (Phasmatodea: Heteronemiidae: Lonchodinae) from the Philippine Islands	0202
A new species of stick insect (Phasmatodea: Heteropterygidae: Obriminae: Obrimini) from Cebu Island, Philippines	0079
<i>Phasmotaenia elongata</i> , n. sp., a new stick insect (Phasmatodea: Phasmatidae) from the Philippine Islands	0088
Phasmotaenia elongata n. sp.	
<i>Phasmotaenia elongata</i> , n. sp., a new stick insect (Phasmatodea: Phasmatidae) from the Philippine Islands	0088
Pheidologeton diversus	
Mandibular shape variation in the ants <i>Diacamma rugosum</i> and <i>Pheidologeton</i> diversus philippinus	0193
Philippine agriculture	
The rice problem in the Philippines: trends, constraints, and policy imperatives	0106
Philippine genetic database	
Resolving questioned paternity issues using a Philippine genetic database	0504
Philippine Grain Quality Standards	
Development of a computer vision system for milled rice quality analysis	0030
Philippine Medicinal Plant	
Isolation and identification of constituents from the antitubercular DCM fraction from the leaf extract <i>Premna odorata</i> blanco	0482
Philippine Mining Act 7942	
Bioremediation: a proven and cost effective tool for repairing the environment	0145
--	------
Philippine National Oil Company-Alternative Fuels Corporation	
MMSU produces 2 million Jatropha seedlings for PNOC-AFC	0072
Philippine native pig	
Bioeconomics of native pig production in Marinduque	0010
Philippine raphignathoidea	
Some Philippine raphignathoidea (acari). IV. the genera <i>Ledermuelleriopsis</i> willmannn and <i>Zetzellia</i> oudemans (stigmaeidae)	0090
Philippine Research Reactor-1 (PRR-1)	
AR_DOSE: a PC program for stack design and the PRR-1 41Ar effluent	0357
DBA_DOSE: a PC program for stack design and the PRR-1 design basis accident	0360
Philippine Research Reactor-1 (PRR-1.	
Basic design parameters for the new PRR-1 stack	0358
Philippine Rice Research Institute	
Save much on seeding with the improved drum seeder	0108
Philippine teak	
Assessment of genetic diversity in <i>Tectona philippinensis</i> Benth. & Hook. f. (Verbenaceae) inferred from <i>TRNL</i> intron sequences	0137
Philippines	
Arsenic and mercury concentrations of the waters and janitor fishes (Pterygoplichthys spp.) in the Marikina River, Philippines	0134
A checklist and host index of Philippine mites (acari) associated with arthropods	0609
A checklist of Navicula (Class Bacillariophyceae) of the Philippines	0149
DNA barcoding of birds in the University of the Philippines, Diliman Campus, with emphasis on striated grassbirds <i>Megalurus palustris</i>	0159
A new species of stick insect (Phasmatodea: Heteropterygidae: Obriminae: Obrimini) from Cebu Island, Philippines	0079
Pestnet: an inexpensive diagnostics and pest management advisory tool for crop protection practitioners in the Philippines	0086
<i>Phasmotaenia elongata</i> , n. sp., a new stick insect (Phasmatodea: Phasmatidae) from the Philippine Islands	0088
Species account of marine diatoms of the genus <i>Pseudo-nitzschia</i> in San Pedro Bay, Philippines	0321
Towards sustainable aquaculture in the Philippines	0340
Phoretic mites	
A checklist and host index of Philippine mites (acari) associated with arthropods	0609
Phosphate	
Preliminary results on the use of clay to control Pyrodinium bloom: a mitigation	0392

strategy

Phosphorus	
Creating a master plan for coconut sap sugar	0021
Photoelectrochemical cell	
Preparation and photoelectrochemical characterization of polyaniline doped with copper phthalocyanine tetrasulfonate	0269
Photonic crystal fiber	
Femtosecond pulse propagation in a highly nonlinear photonic crystal fiber	0532
Photosensitizer dye	
Preparation and photoelectrochemical characterization of polyaniline doped with copper phthalocyanine tetrasulfonate	0269
Phylogenetic tree	
Genetic diversity of Philippine <i>Trichomonas vaginalis</i> isolates using the 5.8S ribosomal RNA gene	0177
Physarum sp.	
Occurrence of corticolous myxomycetes from acacia trees ( <i>Samanea samans</i> Merr) collected from different sites in Luzon Island, Philippines	0205
Physical activity	
Physical activity, energy requirements and adequacy of dietary macro- and micronutrient intakes of older persons in a rural Filipino community	0374
Physical factors	
Development of a simple biological model of vertical phytoplankton distribution	0381
Physical properties of materials	
Radiation processing: a versatile technology for industry	0378
Physician performance	
Effectiveness of group consensus activity in improving appropriateness of care for the management of adult asthmatic patients in the ambulatory care unit	0464
Physico-chemical parameters	
SEAFDEC contribution to the ecological awareness of Philippine Lakes	0397
Physics	
Alkaloid studies on selected Philippine plants: a summary report	0513
An analysis of the precipitable water vapor observed over the PIMO GPS station	0514
Angular and lateral resolution study in pCT imaging involving biological tissues	0515
Anisotropic surface tecturing of silicon substrate using alkaline solution for solar cell application	0516
Broadband continuum generation in single-mode optical fiber	0517
Calorimetric measurements of the output power of the 2.48 GHz commercial magnetron	0518

Derivation of third order MHD equations	0519
Device fabrication of 60 µm resonant cavity light-emitting diode	0520
Differentiating AC and DC field effects on the magnetic susceptibility of bulk $YBa_2Cu_3O_{7-\hat{1}'}$	0521
Dipolar interaction in a one-dimensional ising ring	0522
Double sign reversal of the hall voltage in $Bi_2Sr_2CaCu_2O_{8+\hat{1}'}$ thin film	0523
The effect of adhesion force on cell elastic modulus	0524
Effect of cesium seeding on the production of $H^{\hat{a} \in \mathbb{C}}$ ions in a magnetized sheet plasma source	0525
Effect of filter arrangement in the estimation accuracy of an imaging spectrometer	0526
Effect of training on attitude formation towards nuclear science and technology	0527
Effect of wall material on $H^{\hat{a} \in H}$ production in a plasma sputter-type ion source	0528
Electron traps in GaAs grown by molecular beam epitaxy on On-axis (100) and Off-axis substrates	0529
Enhancement of Fe magnetic moments in Fe/Co (001) multilayers	0530
Experimental verification of the allelomimesis clustering model	0531
Femtosecond pulse propagation in a highly nonlinear photonic crystal fiber	0532
Flux Creep Investigation in $Bi_2Sr_2CaCu_2O_{8+\delta}$ high-temperature superconductor	0533
Frequency conversion of the 355 nm Nd:YAG laser via stimulated raman scattering in hydrogen	0534
Gradient and scattering forces on a Kerr Nanosphere	0535
Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular beam epitaxy	0536
High-order correlation functions and correlation dimensions of chaotic systems without noise and chaotic systems with noise	0537
High-resolution differential thermography of semiconductor edifices	0538
Influence of stacked Ge islands on the dark current-voltage characteristics of a diode for solar cell application	0539
Initial studies of a microwave-induced atmospheric plasma jet	0540
Isotope and geochemical methods in water resources assessment and environmental management	0541
Kinetics of non-isothermal crystallization of coconut-based cholesteryl ester: avrami and ozawa approaches	0542
Learning capability of a silnple neural network	0543
Localization and imaging of integrated circuit defect using simple optical feedback detection	0544
Low-level color and texture feature extraction of coral reef components	0545
Measurement of the temperature of rubidium atoms in a magneto-optical trap	0546
Measurement of three-dimensional deformations by phase-shifting digital	0547

holographic interferometry	
Micro-holograms in a methyl red-doped polymer-dispersed liquid crystal (E48:PVP)	0548
A Monte Carlo simulation study on the interactions of proton, 7Li and 12C with water for hadron therapy application	0549
A multicultural teaching framework for physics	0550
National indoor radon survey in Filipino homes	0551
A Nd:YAG laser-pumped hydrogen raman shifter with capillary waveguide	0552
Near-IR spectral imaging of semiconductor absorption sites in integrated circuits	0553
Nuclear science and technology: perspectives and prospects for Philippine development	0554
Numerical investigation of non-homologous collapse of the one-dimensional gravitational gas	0555
Observation of the quantum-confined stark effect in a GaAs/A1GaAs P-I-N Diode by room temperature photocurrent spectroscopy	0556
Occupational exposure to radon in non-uranium underground mines in the Philippines	0557
Onset of small-world behavior in topologically evolving networks	0558
Onset of turbulence in planar and circular pipe	0559
An optical remote sensing system based on molecular absorption spectroscopy: I. optical arrangement	0560
Optical-feedback semiconductor laser Michelson interferometer	0561
Optimized extraction of $H^{\hat{a}\mathcal{C}^4}$ by three-electrode faraday cup system in magnetized sheet plasma ion source	0562
Profile analysis of hydrogenic helium ions in a magnetized sheet plasma	0563
Radiation-modified natural polymers for biomedical applications	0564
Rectifying behavior of PPy/n-Si heterojunctions	0565
High resolution probing of elastic properties of biopolymers and living cells	0566
Sensitivity of radiation monitoring systems in Manila Ports in detecting contamination in foodstuff shipments	0567
Simultaneous ground-based observations of electric and magnetic field variation near the magnetic equator for space weather study	0568
Static behaviors of confined time-arrival operators	0569
Stretching single molecular DNA by temperature gradient: a white noise functional approach	0570
Study of the perturbation to a bose-einstein gas	0571
Surface modified zinc oxide: a potential smoke sensor at ambient condition	0572
SVD vs PCA : comparison of performance in an imaging spectrometer	0573
Synthesis and characterization of $A1^{+3}$ doped $R_3Fe_{5-x}A1_xO_{12}$ (R=Dy and Y) iron	0574

garnets

Synthesis of bulk superconducting magnesium diboride	0575
Tempering and annealing in a verdier-stockmayer polymer	0576
Temporal coherence behavior of a Nd:YAG pumped waveguide raman shifter	0577
Terahertz-time domain spectroscopic (THz-TDS) measurement of moderately- doped silicon using InAs Emitter under magnetic field	0578
Thermally-activated vortex motion and electrical dissipation in a $Bi_2Sr_2CaCu_2O_{\hat{l}'}$ thin film	0579
Thermodynamics of a one-dimensional gravitational gas in a uniform external field	0580
Thin film formation of gallium nitride using plasma-sputter deposition technique	0581
THz radiation from high-Tc superconducting materials and its applications	0582
Time-of-flight measurement of a 355-nm Nd:YAG laser-produced aluminum plasma	0583
Tracking the dynamic variations in a social network formed through shared interests	0584
Two-photon optical beam-induced current microscopy of light-emitting diodes	0585
A variational perturbation approach	0586
Physiological signal	
Physiological signaling and adaptation processes to drought and salinity stress interactions in rice	0211
Phytochemical	
Phytochemical screening and toxicity of some green leafy vegetables consumed in Batac, Ilocos Norte	0212
Phytochemical analysis	
Glycemic effect of betel nut (Areca catechu Linn.) fruit	0371
Phytochemical screening	
Antimicrobial activity of <i>Chromolaena odorata</i> (L. f.) King & Robinson and <i>Uncaria perrottetii</i> (A. Rich) Merr. <i>extracts</i>	0131
Phytophagous mites	
A review and revised checklist of the mites (acari) in B.P. Gabriel's "insects and mites injurious to Philippine crop plants"	0104
Phytoplankton	
Abundance, composition and distribution of Phytoplankton in Calamianes, Palawan	0129
Development of a simple biological model of vertical phytoplankton distribution	0381
Phytoplankton density	
Some aspects of the reproduction in the elongate sunset clam, <i>Gari elongata</i> (Lamarck 1818) from Banate Bay Area, West Central Philippines	0379
Phytoplankton productivity	
A modelling of eutrophication in Laguna de Bay as a tool for rational resource	0388

management

Phytoremediation	
Effects of arbuscular mycorrhizal fungi inoculation on growth and Cu uptake and toxicity of <i>Desmodium cinereum</i> (Kunth) D.C.	0162
The Identification of metallophytes in the Fe and Cu enriched environments of Brookes Point, Palawan and Mankayan, Benguet and their Implications to Phytoremediation	0261
Pilar and Capiz Bays	
Some aspects of the population biology of the green tiger prawn <i>Penaeus semisulcatus</i> (De Haan, 1844) from Pilar and Capiz Bays, Northern Panay, West Central Philippines	0135
Pine forest	
Preliminary survey of mangrooves and pine forest of Masinloc, Zambales	0353
Pineapple	
Development of Philippine tropical fabrics from indigenous sources	0588
Pinucho	
Muyong: an indigenous sustainable forest management system	0075
Pinus merkusii	
Preliminary survey of mangrooves and pine forest of Masinloc, Zambales	0353
Pisan caves	
Wing ecomorphology and flight performance of bats in Pisan Cave, Kabacan, North Cotabato, Philippines	0235
Pisces	
Influence of music on the growth of koi carp, Cyprinus carpio (Pisces:Cyprindae)	0331
Pitfall trapping	
Survey and census of ground lizards in the permanent field laboratory areas (PFLAS) in Mt. Makiling forest reserve	0230
PLA	
Evaluation of the potency of generic anticancer drugs against various human tumor cell lines using <i>in-vitro</i> cell-based assay and parallel line assay	0168
Placebo	
Clinical trial of Vitex negundo tablet as antitussive	0442
Plain tiger	
Butterfly manure: a novel source of bio-organic fertilizer	0011
Planar	
Onset of turbulence in planar and circular pipe	0559
Planar graph	
On triangle graphs	0430

Unit graphs: dimension and span	0431
Planar grid	
Vertex cover of some supergraphs of planar grid	0432
Planococcus lilacinus (cockerell)	
Exclusion of <i>Planococcus lilacinus</i> (cockerell) from the list of Philippine bamboo pests based on field and laboratory studies	0045
Plant health	
Pestnet: an inexpensive diagnostics and pest management advisory tool for crop protection practitioners in the Philippines	0086
Plant residues	
Organic matter residue management for the improvement of soil quality in lowland rice systems	0083
Plant resources	
Floristic inventory of the Luneta Park, Manila	0170
Plant tissues	
Food and feeding habits of Synodontis nigrita from the Osun River, SW Nigeria	0172
Plants	
Diversity and status of plants in three mountain ecosystems in Southern Mindanao, Philippines	0314
Plasma	
Effect of cesium seeding on the production of $H^{\hat{a}\mathcal{E}^4}$ ions in a magnetized sheet plasma source	0525
Effect of wall material on $H^{\hat{a}\in \mathbb{C}}$ production in a plasma sputter-type ion source	0528
Farm application of radoimmunoassay technology in dairy cattle management	0048
Profile analysis of hydrogenic helium ions in a magnetized sheet plasma	0563
Thin film formation of gallium nitride using plasma-sputter deposition technique	0581
Time-of-flight measurement of a 355-nm Nd:YAG laser-produced aluminum plasma	0583
Plasma jet	
Initial studies of a microwave-induced atmospheric plasma jet	0540
Plasma length	
Initial studies of a microwave-induced atmospheric plasma jet	0540
Plasma minerals	
Subsequent effects of intraruminal soluble glass bolus on plasma calcium, phosphorus and magnesium content of grazing does under backyard conditions in selected areas in Nueva Ecija, Philippines	0324
Plasma or serum retinol	
Method validation of plasma or serum retinol analysis using high performance	0345

liquid chromatography UV/VIS detection	
Plasma sputter-type ion source (PSTIS)	
Effect of wall material on $H^{\hat{a}\in}$ production in a plasma sputter-type ion source	0528
Plasma-sputter	
Thin film formation of gallium nitride using plasma-sputter deposition technique	0581
Pluridentate	
A new species of dried banana leaf spider, <i>Neobrettus</i> wanless 1984 (Araneae: Salticidae) from the agricultural lowlands of Mt. Banahaw, Quezon Province, Philippines	0078
Pluridentate jumping spider	
A new species of the genus <i>Bavia</i> simon, 1877 (Araneae: Salticidae) from the highlands of Sagada, Mountain Province, Luzon Island, Philippines	0080
Plutella xylostella	
Technology transfer of <i>Cotesia</i> -based IPM for diamondback moth on lowland elevation crucifers in Luzon	0120
Pneumoacupuncture	
Application of non-conventional acupuncture in sheep, cattle and water buffaloes	0605
Poaceae/Gramineae	
Rediscovering job's tears	0220
Pogostemon cablin	
Essential oil content and antibacterial activity of some Philippine plants	0251
Pointwise covergence	
A convergence theorem without pointwise covergence	0408
Polar based partitioning	
Comparative antidiabetic activity determination and characterization of potentially active metabolites from the leaves of <i>Syzygium malacunse</i> (makopa) and <i>Momordica charantia</i> (ampalaya)	0369
Policy instruments	
Bioresource management and our common future	0146
Pollen abortiveness	
Comparison of pollen abortiveness in four weed species treated with mercuric chloride	0152
Pollution	
The influence of body weight and diet on the ammonia excretion of the African catfish <i>Clarias geriepinus</i>	0062
SEAFDEC contribution to the ecological awareness of Philippine Lakes	0397
Poly(3,4-ethylenedioxythiophene)	
Electrochemical synthesis and characterization of poly(3,4-	0248

ethylenedioxythiophene)-supported Pd-Sn nanoparticles dispersed on Au electrode for formic acid oxidation	
Nanowire formation and polymer conformations of electropolymerized poly(3,4,- ethylenedioxythiophene) (PEDOT) on iodine-modified Au(111) single crystal electrode as probed by <i>in-situ</i> STM	0298
Poly(methyl methacrylate)	
Synthesis of glycerol-crosslinked poly(methylmethacrylate) microparticles for the controlled delivery of mosquito repellent	0275
Polyacetylene films	
Morphology-controlled polyacetylene films synthesized in liquid crystalline solvents	0265
Polyacrylic acid	
Glycerol-crosslinked polyacrylic acid hydrogels	0260
Synthesis and characterization of chitosan and $\kappa$ -carrageenan IPN hydrogel systems for transdermal drug delivery	0274
Polyaniline	
Effects of applied voltage on the mean diameter of electrospun polyaniline (PANI)- elastomeric adhesive fiber	0589
Electrochemical synthesis and corrosion performance of polypyrrole and poly(pyrrole-co-aniline) films on copper	0590
Polyaniline (PAni)	
Preparation and photoelectrochemical characterization of polyaniline doped with copper phthalocyanine tetrasulfonate	0269
Polyaniline (PANI)	
Spectrophotometric analysis of $\alpha$ -tocopherol using emeraldine film	0272
Polyaniline/nylon composite	
Fish freshness analysis using a polyaniline/nylon composite-based chemiresistor sensor	0343
Polycrystalline Au,	
Electrochemical synthesis and characterization of poly(3,4- ethylenedioxythiophene)-supported Pd-Sn nanoparticles dispersed on Au electrode for formic acid oxidation	0248
Polycyclic aromatic hydrocarbons	
Degradation of pyrene, fluorene and fluoranthene: the role of lignin peroxidase and manganese peroxidase from Ganoderma lucidum	0154
Polycystis spp.	
Food and feeding habits of Synodontis nigrita from the Osun River, SW Nigeria	0172
Polyester	
Electroconductive polythiophene/polyester composite as <i>e</i> -cloth	0249

Evaluation of the effectiveness of fabric stain removers	0591
Polyester/cotton	
Evaluation of the effectiveness of fabric stain removers	0591
Polyethylene glycol	
Factors contributing to the bioburden level of polyvinylpyrrolidone-kappa carrageenan hudrogel	0257
Polyethylene oxide (PEO)	
Radiation-modified natural polymers for biomedical applications	0564
Polyhistidine repeats	
Enhanced autophagic cell death in expanded polyhistidine variants of HOXA1 reduces PBX1 coupled transcriptional activity and inhibits neuronal differentiation	0166
Polymer-dispersed liquid crystal (PDLC)	
Micro-holograms in a methyl red-doped polymer-dispersed liquid crystal (E48:PVP)	0548
Polymer-dispersed liquid crystals (PDLC)	
Side-chain polymer as matrix in cholesteric liquid crystals/polymer composites	0271
Polymerase chain reaction	
Single nucleotide polymorphism genotyping of antithrombotic therapy resistance markers using high resolution melt analysis	0508
Polymerase chain reaction (PCR)	
Comparison of conventional plate assays with DNA-based screening protocols for protease and cellulase production from putative <i>Bacillus</i> isolates	0151
Genetic diversity of Philippine <i>Trichomonas vaginalis</i> isolates using the 5.8S ribosomal RNA gene	0177
Molecular cloning of cysteine protease inhibitors from four endemic Philippine plants	0198
Polymeric membranes	
Polymeric membranes for pressure-driven filtration	0268
Polymers	
Free radical synthesis of endfunctionalized polymers	0259
Polymesoda erosa	
The relationship of shell dimensions and shell volume to live weight and soft tissue weight in the mangrove clam, <i>Polymesoda erosa</i> (Solander, 1786) from Northern Australia	0221
Polymorphisms	
Genetic polymorphism of CYP2D6*10 gene among Filipinos	0470
Polynomial	
Cubic construction over binary cyclic codes	0410

Polypyrrole	
Conductive polymers as host matrices for the dispersion of gold nanoparticles with electrocatalytic properties	0244
Electrochemical synthesis and corrosion performance of polypyrrole and poly(pyrrole-co-aniline) films on copper	0590
Polystyrene (PS)	
Surface molecular aggregation states of monodisperse and polydisperse polystyrene films on scanning force microscope	0309
Polysulfone (PS)	
Polymeric membranes for pressure-driven filtration	0268
Polythiophene	
Conductive polymers as host matrices for the dispersion of gold nanoparticles with electrocatalytic properties	0244
Electroconductive polythiophene/polyester composite as e-cloth	0249
Fabrication of anodic alumina oxide templates and their use for the electrosynthesis of polythiophene nanowires	0254
Polyvinylpyrrolidone	
Factors contributing to the bioburden level of polyvinylpyrrolidone-kappa carrageenan hudrogel	0257
Pomacea canaliculata	
Potential effects of commercial molluscicides used in controlling golden apple snails of the native snail <i>Vivipara costata</i> (Quoy & Gaimard)	0092
Poor compliance	
Predictors of poor compliance to medications among adult Filipino patients diagnosed with hypertension in selected provinces of the Philippines	0500
Population dynamics	
On the dynamics of resource-consumer-toxicant systems II: stress effects on reproduction and their implications on the survival of a population	0425
Population genetic structure	
Assessment of genetic diversity in <i>Tectona philippinensis</i> Benth. & Hook. f. (Verbenaceae) inferred from <i>TRNL</i> intron sequences	0137
Population growth	
Basic health services and population growth	0436
Population policy	
The economic impact of the demographic crisis: its implications on public policy	0601
Population structure	
State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan	0323
Porcine epidemic diarrhea (PED)	

Diagnosis and control of porcine epidemic diarrhea: case report	0034
Pore former polymer foam	
Porous biphasic calcium phosphate ceramic for anopthalmic socket implant	0497
Porifera	
Antimicrobial properties of some marine sponge (porifera) from Mactan, Cebu, Philippines	0132
Post-abortion care	
Probing the decisions behind induced abortion in the Philippines	0502
Post-column reaction	
Ion chromatographic method with post-column fuchsin reaction for measurement of bromate in chlorinated water	0262
Post-prandial excretion rates	
The influence of body weight and diet on the ammonia excretion of the African catfish <i>Clarias geriepinus</i>	0062
Postharvest losses	
Quantitative and qualitative assessment of corn postharvest losses	0097
Postharvest quality	
Improving quality and shelf-life of vegetables and fruits by evaporative cooling storage	0058
Postharvest technologies	
Quantitative and qualitative assessment of corn postharvest losses	0097
Potassium	
Butterfly manure: a novel source of bio-organic fertilizer	0011
Creating a master plan for coconut sap sugar	0021
Effects of lahar on the water quality of the rivers and tributaries of Pinatubo volcano	0363
Potassium oxalate	
Balimbing: a fruit with myriad uses	0009
Potency	
Evaluation of the potency of generic anticancer drugs against various human tumor cell lines using <i>in-vitro</i> cell-based assay and parallel line assay	0168
Potentiodynamic deposition	
Electrochemical synthesis and characterization of poly(3,4- ethylenedioxythiophene)-supported Pd-Sn nanoparticles dispersed on Au electrode for formic acid oxidation	0248
Potentiostatic electropolymerization	
Electrochemical synthesis and characterization of poly(3,4- ethylenedioxythiophene)-supported Pd-Sn nanoparticles dispersed on Au electrode for formic acid oxidation	0248

Poultry

5	
Butterfly manure: a novel source of bio-organic fertilizer	0011
Power law	
Experimental verification of the allelomimesis clustering model	0531
Power spectrum	
High-order correlation functions and correlation dimensions of chaotic systems without noise and chaotic systems with noise	0537
PPM-DOTS center	
A comparative study on the treatment outcome of tuberculosis patients managed in a PPM-DOTS center by type of treatment partners	0448
PPy/n-Si heterojunctions	
Rectifying behavior of PPy/n-Si heterojunctions	0565
Pranic healing	
Pranic healing as adjunct treatment in functional dyspepsia	0499
Praziquantel	
A new look at heterophyidiasis (intestinal fluke infection): a food-borne parasitic zoonosis in the Philippines	0491
Pre-metaphase	
Preliminary cytogenetic characterization of the golden birdwing, <i>Troides rhadamantus</i> (Lucas) (Lepidoptera: Papilionidae)	0216
Precipitable water vapor (PWV)	
An analysis of the precipitable water vapor observed over the PIMO GPS station	0514
Precipitation polymerization	
Performance evaluation of tailor made microspheres as sensing layer responsive to residual chloramphenicol in food matrices	0493
Precocene II	
Antigonadotropic effects of precocene II: allaticidal action in females of Nilaparvata lugens (Stal)	0608
Predictors	
Forecasting dengue incidence in the National Capital Region, Philippines: using time series analysis with climate variables as predictors	0415
Predictors of poor compliance to medications among adult Filipino patients diagnosed with hypertension in selected provinces of the Philippines	0500
Preharvest sprouting	
Mapping quantitative trait loci associated with resistance to preharvest sprouting in wheat	0070
Preliminary yield trial	
Development of improved varieties of mungbean (NSIC Mg14 and NSIC mg15)	0032

Premna odorata Blanco Isolation and identification of constituents from the antitubercular DCM fraction 0482 from the leaf extract Premna odorata blanco Presence of noise SVD vs PCA : comparison of performance in an imaging spectrometer 0573 Pressurized treadle pump Reducing fossil fuel emission using treadle pump technology 0303 Pretreatment Effect of pretreatment on the structure and catalytic properties of rice hull-derived 0040 zeolites Prev A new species of dried banana leaf spider, *Neobrettus* wanless 1984 (Araneae: 0078 Salticidae) from the agricultural lowlands of Mt. Banahaw, Quezon Province, Philippines Principal component analysis (PCA) SVD vs PCA : comparison of performance in an imaging spectrometer 0573 Private led extension Comparative analysis of coffee farming practices introduced by government and the 0017 private sectors in Paksong District, Champasak Province, Lao PDR Probiotic soya milk Probiotic property of locally-isolated lactic acid bacteria and development of soya 0219 based probiotic product **Probiotics** Fermentation kinetics of gelatin-immobilized Lactobacillus plantarum BS using 0169 skim milk as substrate Procrustes Sexual dimorphism and morphometric differentiation among colormorphs of the 0224 swordtail fish Xiphophorus helleri Production Sustainable marine fisheries production in the Philippines 0339 **Production traits** 0010 Bioeconomics of native pig production in Marinduque Productivity Productivity and soil erosion in various crop cover in the mountainous areas of 0094 Bondoc Peninsula, Philippines Productivity growth The rice problem in the Philippines: trends, constraints, and policy imperatives 0106 Progesterone in milk

Farm application of radoimmunoassay technology in dairy cattle management	0048
Projection techniques	
Derivation of third order MHD equations	0519
Propafenone	
Fabrication of chitosan micron and submicron particles for drug sequestration	0255
Properties	
Structure and mechanical property of MgO-ZrO2 ceramic doped with CeO2	0308
Protected areas	
Diversity and status of plants in three mountain ecosystems in Southern Mindanao, Philippines	0314
Protection of ecosystem function (recycling)	
The scientific basis of marine fish farm regulation	0396
Protection of ecosystem structure (conservation)	
The scientific basis of marine fish farm regulation	0396
Protection of other resource users	
The scientific basis of marine fish farm regulation	0396
Protein folding	
High resolution probing of elastic properties of biopolymers and living cells	0566
Protein profile	
Local Vibrio isolates exhibit molecular characteristics distinct from reference V. harveyi and V. campbellii strains	0191
Proteins	
Identification of ribosome-inactivating protein (RIP) in selected plants for medicinal plant properties screening	0183
Proton computed tomography	
Angular and lateral resolution study in pCT imaging involving biological tissues	0515
Protracted breeding season	
Some aspects of the reproduction in the elongate sunset clam, <i>Gari elongata</i> (Lamarck 1818) from Banate Bay Area, West Central Philippines	0379
PSB Rc 72H	
Seed quality response to fungicide treatment of a line and F <sub>1</sub> hybrid seeds	0109
Pseudo-nitzschia species	
Species account of marine diatoms of the genus <i>Pseudo-nitzschia</i> in San Pedro Bay, Philippines	0321
Pseudomonas aeruginosa	
Comparative treament of <i>Pseudomonas aeruginosa</i> burn wound infection using bacteriophage MB08 and antibiotics	0150
Psidium guajava	

A review of the genus ultratenuipalpus mitrofanov (acari:tenuipalpidae) with descriptions of two new species from the Philippines	0105
Psychiatric illness	
The prevalence of depression in the elderly at Area C, San Martin II, Sapang Palay, Del Monte Bulacan	0501
Psychosocial variables	
Determinants of compliance to therapeutic regimen among selected Filipino juvenile diabetics	0457
Psychotherapy	
The effect of individual versus group psychotherapy among grade six students with depression	0461
The prevalence of depression in the elderly at Area C, San Martin II, Sapang Palay, Del Monte Bulacan	0501
Psylloidea	
A new genus and species of aphalaridae (psylloidea, hemiptera) from Mount Makiling, Luzon Island, Philippines	0077
The <i>Paurocephala psylloptera</i> -complex (Hemiptera: Psylloidea: Aphalaridae) in the Philippines with description of a new species	0085
<i>Phacopteron gabrieli</i> , a new psylloid (Hemiptera: Psylloidea: Phacopteronidae) from Mount Makiling, Luzon Island, Philippines	0087
Pterygoplichthys	
Salinity tolerance of introduced South American sailfin catfishes (Loricariidae: Pterygoplichthys GILL 1858)	0223
Pterygoplichthys pardalis	
Lipid peroxidation and patterns of cadmium and lead accumulation in the vital organs of suckermouth armored catfish <i>Pterygoplichthys pardalis</i> castelnau from Marikina River	0190
Public attitudes	
Effect of training on attitude formation towards nuclear science and technology	0527
Public awareness	
Exploring the use of theater as an intervention tool for FMD control	0046
Public policy	
The economic impact of the demographic crisis: its implications on public policy	0601
PUFA	
Marine copepods: a potential rich source of omega-3 polyunsaturated fatty acids, a dietary supplement for healthy aging	0373
PUF_DOSE	
PUF_DOSE: a PC program to calculate doses from a puff release of radioactivity	0365
Pujada Bay	

Population structure and reproductive biology of <i>Siganus fuscescens</i> Houttuyn 1782 (Perciformes, Siganidae) in Pujada Bay, Southeastern Mindanao, Philippines	0214
Pulmonary illness	
Morbidity changes among smoking clients who consulted at Eastern Visayas Regional Medical Center Family Health Clinic from October 2003 - October 2004	0487
Pulmonary paragonimiasis	
The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0439
Pulmonary tuberculosis	
The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0439
The relation of family function and adherence to tuberculosis treatment	0503
Purchase order	
Determining optimal inventory levels of multiple repairable items	0414
Pure stands	
Silvical characteristics of pure and mixed stands in permanent field laboratory area (PFLA 3), Mt. Makiling Forest Reserve	0354
Purified fractions	
The comparative effects of purified fractions of <i>Vitex negundo L</i> . (lagundi) and crude extracts of <i>Cassia alata L</i> . (akapulko) and <i>Artemisia vulgaris L</i> . (damong maria) on inflammatory processes. <i>In vitro</i>	0447
Pyriculana grisea	
The application of molecular marker-assisted selection in rice breeding	0006
Pyrodinium bahamense var	
Preliminary results on the use of clay to control <i>Pyrodinium</i> bloom: a mitigation strategy	0392
QTL	
Quantitative trait loci (QTL) analysis for iron toxicity tolerance in rice (Oryza sativa L.)	0099
Quality of life	
Being diabetic: symptom distress and quality of life	0368
Hypertensive patients' symptoms distress and quality of life	0474
Quantitative resistance loci	
Quantitative resistance loci (QRL) against bacterial blight ( <i>Xanthomonas oryza pv. oryzae</i> ) and leaf blast ( <i>Pyricularia orazae Sacc.</i> ) and quantitative trait loci (QTL) for grain qualities in rice ( <i>Oryza sativa L.</i> )	0098
Quantitative trait loci	

Quantitative resistance loci (QRL) against bacterial blight ( <i>Xanthomonas oryza pv. oryzae</i> ) and leaf blast ( <i>Pyricularia orazae Sacc.</i> ) and quantitative trait loci (QTL) for grain qualities in rice ( <i>Oryza sativa L.</i> )	0098
Quantization error	
SVD vs PCA : comparison of performance in an imaging spectrometer	0573
Quantum dots	
<i>In vivo</i> toxicology assessment of sytematically introduced functionalized nanoparticles in mice	0184
Quantum mechanics	
A variational perturbation approach	0586
Quantum moment maps	
Deformation quantization and quantum moment maps	0413
Quantum-confined stark effect	
Observation of the quantum-confined stark effect in a GaAs/A1GaAs P-I-N Diode by room temperature photocurrent spectroscopy	0556
Quasi-cyclic codes	
Cubic construction over binary cyclic codes	0410
Quasi-regular self-complementary graph	
On construction of a quasi-regular self-complementary graph	0407
Quat 188	
Synthesis and characterization of chitosan and $\kappa$ -carrageenan IPN hydrogel systems for transdermal drug delivery	0274
Quaternion matrices	
Decompositions involving quaternion matrices and complex partitioned matrices	0412
Quatization	
Deformation quantization and quantum moment maps	0413
Quick-cooking rice	
Quick-cooking rice processes for Philippine rice cultivars	0346
Quiscalis	
Molecular cloning of cysteine protease inhibitors from four endemic Philippine plants	0198
Rabies	
Comparative study on the use of fourth finger technique versus standard technique of intradermal injection of anti-rabies vaccine	0449
Radiality	
On the radiality assumption for existence and blowing up	0428
Radiation dosage	
Dosimetry application of gate in prostate brachytherapy	0459

Radiation measurements	
Sensitivity of radiation monitoring systems in Manila Ports in detecting contamination in foodstuff shipments	0567
Radiation monitoring	
Sensitivity of radiation monitoring systems in Manila Ports in detecting contamination in foodstuff shipments	0567
Radiation protection activities	
Nuclear science and technology: perspectives and prospects for Philippine development	0554
Radiation-induced inherited sterility	
Genetic methods for a rea-wide management of lepidopterous pests with emphasis on $F_1$ sterility	0469
Radiation-vulcanized natural rubber latex (RVNRL)	
Radiation-modified natural polymers for biomedical applications	0564
Radioactive air emissions	
Basic design parameters for the new PRR-1 stack	0358
Radioactive waste repositories	
Investigation of arsenate uptake by hydrotalcite at hyperalkaline and elevated temperature conditions	0296
Radioactivity	
<sup>137</sup> Cs and <sup>210</sup> Pb distribution in Manila Bay sediment	0239
Radiation processing: a versatile technology for industry	0378
Radioactivity measurements	
Minimum detectable activity of a 5x5 NaI T1) gamma spectrometer used for the radioactivity clearance measurements of the PRR-1 decommissioning project	0364
Radioimmunoassay technology	
Farm application of radoimmunoassay technology in dairy cattle management	0048
Radionuclide fallout	
<sup>137</sup> Cs and <sup>210</sup> Pb distribution in Manila Bay sediment	0239
Radiopharmaceuticals	
The development of technetium - 99m radiopharmaceuticals: technetium -99m phytate	0362
Radon gas	
Occupational exposure to radon in non-uranium underground mines in the Philippines	0557
Radon in mines	
Occupational exposure to radon in non-uranium underground mines in the Philippines	0557

Radon survey	
National indoor radon survey in Filipino homes	0551
Rain tree fruit	
Yield potential of rain tree fruit (Samanea saman Merr.) as feedstock for biofuel production	0600
Rainfall	
Relative sea level changes and worsening floods in the Western Pampanga Delta: causes and some possible mitigation measures	0366
Rainfed	
Corn in the Philippines: feeding the population beyond the present	0020
Raman scattering	
Femtosecond pulse propagation in a highly nonlinear photonic crystal fiber	0532
Raman shifter	
Temporal coherence behavior of a Nd:YAG pumped waveguide raman shifter	0577
Raman shifting	
Frequency conversion of the 355 nm Nd:YAG laser via stimulated raman scattering in hydrogen	0534
Ranidae	
Distribution of anuran species in Loboc Watershed of Bohol Island, Philippines	0157
Ranitidine	
The effect of banana fruit ( <i>Musa sapientum</i> ) as adjunct to ranitidine in the management of uninvestigated dyspepsia	0460
RAPD	
Analysis of genetic diversity in coconut by RAPD	0004
RAPD markers	
Genetic variability within the population of the vulnerable Mindanao endemic Blue- Capped Kingfisher ( <i>Actenoides hombroni</i> ) using polymorphic DNA markers	0178
Rare earths	
Synthesis and characterization of $A1^{+3}$ doped $R_3Fe_{5-x}A1_xO_{12}$ (R=Dy and Y) iron garnets	0574
Rational resource management	
A modelling of eutrophication in Laguna de Bay as a tool for rational resource management	0388
Rayon	
Evaluation of the effectiveness of fabric stain removers	0591
RBB	
Modularity and integration in the forewing of the Philippine rice black bug (Scotinophara SPP. stål, hemiptera: pentatomidae)	0197

Recombinant allergen	
CpG oligodeoxynucleotides as immunomodulators of rBlo t 5-induced allergic reactions	0153
Recombinant DNA	
Agricultural biotechnology trends and challenges	0130
Recombinant protein	
Cloning and expression of non-structural protein 1 (NS1) of dengue serotypes 1 and 2	0444
Recruitment pattern	
Some aspects of the population biology of the green tiger prawn <i>Penaeus</i> semisulcatus (De Haan, 1844) from Pilar and Capiz Bays, Northern Panay, West Central Philippines	0135
Recycled water	
The efficiency and social acceptability of the constructed wetland of Bayawan City, Negros Oriental	0316
Red pinoy	
Damage assessment of lepidopterous pests of onion in Nueva Ecija	0024
REDD	
Google earth: a tool for eliciting spatial information about forest degradation from local people	0592
Reef check method	
A post-tsunami assessment of coastal living resources of Langkawi Archipelago, Peninsular Malaysia	0391
Reflectivity	
Anisotropic surface tecturing of silicon substrate using alkaline solution for solar cell application	0516
Reflux distillation	
Properties and performance of MMSU hydrous biofuel	0598
Reforestation	
Improving the environment and living conditions of the rural poor: potential of reforestation CDM in the mangrove communities of San Juan Batangas	0352
Regeneration dynamics	
Silvical characteristics of pure and mixed stands in permanent field laboratory area (PFLA 3), Mt. Makiling Forest Reserve	0354
Regeneration patterns	
Silvical characteristics of pure and mixed stands in permanent field laboratory area (PFLA 3), Mt. Makiling Forest Reserve	0354
Regimen-associated variables	
Determinants of compliance to therapeutic regimen among selected Filipino	0457

juvenile diabetics

Relative potency	
Evaluation of the potency of generic anticancer drugs against various human tumor cell lines using <i>in-vitro</i> cell-based assay and parallel line assay	0168
Relative warp	
Relative warp analysis and correlation analysis based on distances to study morphological variations in the shell shape of <i>Pomacea canaliculata</i> (Lamarck) found in Iligan City	0222
Reliability	
Modified caregiver strain index	0485
Reliability index	
Modified caregiver strain index	0485
Relict species	
Evaluation of Philippine Gemmula: forms related to G speciosa and G kieneri	0167
Remote sensing of the atmosphere	
An analysis of the precipitable water vapor observed over the PIMO GPS station	0514
Remote sensing system	
An optical remote sensing system based on molecular absorption spectroscopy: I. optical arrangement	0560
Renewable	
Eco-stairs	0288
Renewable energy resources	
Assessment of renewable energy resource potential and application for decentralized rural electrification using geographic information system (GIS)	0281
Repair induction	
Determining optimal inventory levels of multiple repairable items	0414
Repairable inventories	
Determining optimal inventory levels of multiple repairable items	0414
Repeated-mark-recapture technique	
Survey and census of ground lizards in the permanent field laboratory areas (PFLAS) in Mt. Makiling forest reserve	0230
Repetik	
Studies on the outer root bark of <i>Kokoona ochracea</i> (ELM) Merr. (family celastraceae)	0510
Reproduction	
Application of non-conventional acupuncture in sheep, cattle and water buffaloes	0605
Reproduction traits	
Bioeconomics of native pig production in Marinduque	0010

Reproductive biology

Some aspects of the reproduction in the elongate sunset clam, <i>Gari elongata</i> (Lamarck 1818) from Banate Bay Area, West Central Philippines	0379
Reproductive control methods	
Hormonal contraception: an approach to the demographic crisis in the Philippines	0473
Reproductive system	
Developmental Biology of the Supermale YY Tilapia (Oreochromis niloticus): histogenesis of the reproductive system	0156
Reservoirs	
Water quality analysis and utilization of small farm reservoirs (SFRs) for aquaculture in Region III	0277
Resident and transient microorganisms	
Identification of bacteria isolated from standing and dripping water of Bulalon Cave, Burdeos, Polillo Islands, Quezon Province	0182
Resistance	
Molecular and phenotypic studies of resistance genes introgressed from wild tomato ( <i>Lycopersicon chilense</i> ) to cultivated tomato ( <i>Lycopersicon esculentum</i> ) against tomato leaf curl virus isolate from the Philippines	0073
Resolution	
SVD vs PCA : comparison of performance in an imaging spectrometer	0573
Resort	
Some butterflies of Boracay Island	0278
Resource management	
Population structure and reproductive biology of <i>Siganus fuscescens</i> Houttuyn 1782 (Perciformes, Siganidae) in Pujada Bay, Southeastern Mindanao, Philippines	0214
Reticuloendothelial system	
The development of technetium - 99m radiopharmaceuticals: technetium -99m phytate	0362
RETScreen	
Assessment of renewable energy resource potential and application for decentralized rural electrification using geographic information system (GIS)	0281
Reverse microemulsion	
Fabrication of chitosan micron and submicron particles for drug sequestration	0255
Reverse osmosis (RO)	
Polymeric membranes for pressure-driven filtration	0268
Reversed-phase	
Cyclosporin analysis in blood by automated reserved-phase high performance liquid chromatographic method coupled with solid phase extraction and speed vacuum	0455

evaporation

RF transmitter

Speech recognition controller for motorized wheelebair	0207
	0307
	0174
cosmopolitan, regional, and the national populations	0174
Rhacophoridae	
Distribution of anuran species in Loboc Watershed of Bohol Island, Philippines	0157
Rheumatic heart disease (RHD)	
The rifasaf project: a case-control study on risk factors for stroke among Filipinos	0505
Rhinagrium philippinum	
Contribution to the taxonomy of Philippine megapodagrionidae (odonata:zygoptera)	0018
Rhizobia	
Co-inoculation of mungbean with rhizobia and plant growth promoting rhizobacteria (PGPR) improves nodulation, dry matter yield and nitrogen uptake	0016
Rhizobium	
The use of <i>Gus</i> -reporter gene technique in the assessment of the competitive ability of <i>Rhizobium etli</i> nodulating <i>Phaseolus vulgaris</i> L. from the acidic soils of La Trinidad, Benguet, Philippines	0233
Rhizobium etli RG-136	
The use of <i>Gus</i> -reporter gene technique in the assessment of the competitive ability of <i>Rhizobium etli</i> nodulating <i>Phaseolus vulgaris</i> L. from the acidic soils of La Trinidad, Benguet, Philippines	0233
Rhizobium etli RG-57	
The use of <i>Gus</i> -reporter gene technique in the assessment of the competitive ability of <i>Rhizobium etli</i> nodulating <i>Phaseolus vulgaris</i> L. from the acidic soils of La Trinidad, Benguet, Philippines	0233
Rhizobium tropici UMR-1899	
The use of <i>Gus</i> -reporter gene technique in the assessment of the competitive ability of <i>Rhizobium etli</i> nodulating <i>Phaseolus vulgaris</i> L. from the acidic soils of La Trinidad, Benguet, Philippines	0233
Rhizophora	
Improving the environment and living conditions of the rural poor: potential of reforestation CDM in the mangrove communities of San Juan Batangas	0352
Rhizopus oryzae	
Lactic acid fermentation from <i>Jatropha curcas</i> L. press cake and raw cassava starch using <i>Rhizopus oryzae</i> NRRL-395	0594
Rhopalocera	
A checklist of the rhopalocera (lepidoptera) of Mount Arayat, Pampanga, Philippines	0013

A survey of the rhopalocera (lepidoptera) of Mt. Makiling, Laguna, Philippines	0115
A taxonomic list of butterflies (lepidoptera:papilionoidea and hesperioidea) from Mount Banahao de Lucban, Quezon Province, Philippines	0118
Rhythmic sound	
Influence of music on the growth of koi carp, Cyprinus carpio (Pisces:Cyprindae)	0331
RIA technology	
Farm application of radoimmunoassay technology in dairy cattle management	0048
Rice	
2 more private rice hybrids for wider farmers' choice	0001
Alternative management strategies against the rice root-knot nematode, <i>Meioidogyne graminicoia</i> in rice-onion system	0003
Hull-imposed dormancy in rice	0057
Improving the production of corn and rice with controlled availability fertilizer (CAF) in Pinatubo Lahar	0059
Kinetics of iron in the development of rapid screening technique for iron toxicity tolerance in rice	0066
Potential effects of commercial molluscicides used in controlling golden apple snails of the native snail <i>Vivipara costata</i> (Quoy & Gaimard)	0092
Quantitative trait loci (QTL) analysis for iron toxicity tolerance in rice (Oryza sativa L.)	0099
The rice problem in the Philippines: trends, constraints, and policy imperatives	0106
Water management for improved post-rice production of upland crops in irrigated paddies	0126
Rice farming	
Organic rice farming in Northeastern Thailand: an assessment of farmers' practices	0084
Rice hull burning	
Alternative management strategies against the rice root-knot nematode, <i>Meioidogyne graminicoia</i> in rice-onion system	0003
Rice hull-derived	
Effect of pretreatment on the structure and catalytic properties of rice hull-derived zeolites	0040
Rice hull-fed furnace system	
Development of Philmech rice hull-fed furnace system for heating mechanical dryers	0033
Rice husk ash	
Rice husk ash as soil stabilizer	0306
Rice milling	
Physical quality characterization of milled rice using computer vision technique	0300
Rice seed	

Save much on seeding with the improved drum seeder	0108
Rice straw	
In situ compositing of rice straw using embased inoculant and chicken manure	0060
Rice tungro disease	
Transgenic rice plants overexpressing host transcription factors Rf2A and Rf2B are tolerant to tungro disease	0122
Rice wine	
Rediscovering job's tears	0220
Rice-cum-fish culture	
Growth performance and yield of selected strain (gift) nile tilapia ( <i>Oreochromis niloticus</i> L.) in lowland irrigated ricefields integrated with azolla and mallard duck	0055
River basin	
Arsenic and mercury concentrations of the waters and janitor fishes (Pterygoplichthys spp.) in the Marikina River, Philippines	0134
Riverbank protection	
Utilizing balete for riverbank protection and watershed rehabilitation	0125
RNA interference	
Unraveling shrimp immunity by RNA interference technology	0232
Rogongon, Iligan City	
Genetic variability within the population of the vulnerable Mindanao endemic Blue- Capped Kingfisher ( <i>Actenoides hombroni</i> ) using polymorphic DNA markers	0178
Root-knot	
Alternative management strategies against the rice root-knot nematode, <i>Meioidogyne graminicoia</i> in rice-onion system	0003
Rotifera	
Zooplankton diversity in Philippine Lakes	0236
Round scad	
Total mercury in three fish species sold in a Metro Manila Public Market: monitoring and health risk assessment	0276
Roystonea regia	
Invasion of the buff coconut mealybug ( <i>Nipaecoccus nipae</i> ) in U.P. Los Baños campus, elucidation of the confounded "mealybug burn" damage and practical control	0065
rpoB	
Multiplex PCR detection of <i>Mycobacterium tuberculosis</i> and characterization of mutations in katG and rpoB genes of resistant strains in Metro Manila	0489
RT-PCR	
Histomorphometry and osteoinductive growth factor levels of fracture callus versus iliac crest bone grafts	0472

Rubber

Rubber disease enters Republic of the Philippines; found in Mindanao	0107
Rubber leaf spot disease	0107
Rubber disease enters Republic of the Philippines; found in Mindanao	0107
Rubiaceae	
Molecular investigation of cyclotides in <i>Rubiaceae</i> and <i>Cucurbitaceae</i>	0199
Rubidium atoms	
Measurement of the temperature of rubidium atoms in a magneto-optical trap	0546
Ruminant	
The modified horn ring method as a tool in determining the age of carabao	0606
Runoff	
Predicting the effects of land use on runoff and sediment yield in selected sub- watersheds of the manupali river using the Arcswat model	0093
Rural agrarian community	
Women in health development: the Mangyans of Mindoro Province	0512
Rural employment	
The rural women entrepreneurs: their business profiles, entrepreneurial behaviors, management styles, problems and prospects	0280
Rural industrialization	
Spill-over effects of rural industrialization on community transformation	0322
Rust	
Effect of functional iron oxide nanocrystals on the arsenic level in drinking water	0247
Evaluation of the effectiveness of fabric stain removers	0591
S. mansoni	
Vaccine development against the Philippine strain of Schistosoma japonicum	0234
Sago palm seeds	
An easy way to germinate sago palm seeds found	0038
Salinity	
Fish culture in cages in Lake Danao, Cebu	0329
Movement of water across passages connecting Philippine inland sea basins	0389
Salinity tolerance	
Salinity tolerance of freshwater catfish ( <i>Clarias batrachus</i> Linnaeus and <i>Clarias</i>	0333
<i>macrocephalus</i> Gunther) in aquaria in the laboratory of CSCST-Fishery and Industrial College, San Francisco, Cebu	0555
Salinity tolerance of introduced South American sailfin catfishes (Loricariidae: Pterygoplichthys GILL 1858)	0223
Salinity, drought	
Physiological signaling and adaptation processes to drought and salinity stress	0211

interactions in rice

Salmacis sphaeroides, Effect of light on

Effects of UV -C on the masking behavior of the green urchin *Salmacis sphaeroides* 0164 (Linnaeus, 1758)

Salticidae

Salticidae	
A new species of dried banana leaf spider, <i>Neobrettus</i> wanless 1984 (Araneae: Salticidae) from the agricultural lowlands of Mt. Banahaw, Quezon Province, Philippines	0078
A new species of the genus <i>Bavia</i> simon, 1877 (Araneae: Salticidae) from the highlands of Sagada, Mountain Province, Luzon Island, Philippines	0080
Saltwater	
A modelling of eutrophication in Laguna de Bay as a tool for rational resource management	0388
Saluyot	
Masakusikam herbed cookies: incorporation of leaves of malungay (Moringa oleifera), saluyot (Corchorus olitorius), kulitis (Amaranthus spinosus), sili (Capsicum frutescens) and kamote (Ipomea batatas)	0195
Salvinia	
<i>Limnocharis flava</i> L. BUCH., and <i>Salvinia molesta</i> MITCHELL: potential threats to aquatic ecosystem in Luzon	0067
Salvinia molesta	
<i>Limnocharis flava</i> L. BUCH., and <i>Salvinia molesta</i> MITCHELL: potential threats to aquatic ecosystem in Luzon	0067
San Pedro Bay	
Species account of marine diatoms of the genus <i>Pseudo-nitzschia</i> in San Pedro Bay, Philippines	0321
Sandell-Kolthoff	
Method validation for the determination of iodine in urine by ammonium persulfate digestion with spectrophotometric detection of the Sandell-Kolthoff reaction	0344
Sandy clay	
Effects of zinc and boron fertilization on the alleviation of poor crop growth in heavily limed two acidic soils	0043
Sangkap pinoy seal	
Comparative effectiveness of an iron-fortified product with the sangkap pinoy seal and ferrous sulfate on the hemoglobin and hematocrit levels of five year old pre-	0446

school children at the Eskwelahang Munti Barangay Potrero, Malabon City

Saponins Studies on *Schistosomiasis japonica* and Saponins

0509

## Sarcotesta

Sardinella spp	
Survivorship and growth performance of red spiny lobster <i>Panulirus longipes</i> 0. <i>longipes</i> reared in floating netcages fed with <i>Sardinella</i> spp at different feeding rates	)338
Sardinella tawilis	
Translocation of the Clupeid <i>Sardinella tawilis</i> to another lake in the Philippines: a 02 proposal and ecological considerations	)231
Zooplankton diversity in Philippine Lakes 02	)236
Savu Sea	
Ecology and genetic structure of giant clams around Savu Sea, East Nusa Tenggara 0 Province, Indonesia	)160
Scale insects	
Biological studies of <i>Aphytis</i> sp. nr. <i>chrysomphali</i> (Hymenoptera: Aphelinidae) 0	)142
Scallop shell	
Mechanism of $H_2S$ absorption using calcium-based sorbents under in-situ coal gasification conditions $0^4$	)484
Scanning electron microscope	
Production of particleboard from <i>Nymphaea stellata willd</i> (water lily) fiber with 09 high-density polyethylene (HDPE) and polystyrene (PS) as binders	)597
Scanning force microscopic (SfM)	
Surface molecular aggregation states of monodisperse and polydisperse polystyrene 0. films on scanning force microscope	)309
Scanning tunneling microscopy	
Nanowire formation and polymer conformations of electropolymerized poly(3,4,- ethylenedioxythiophene) (PEDOT) on iodine-modified Au(111) single crystal electrode as probed by <i>in-situ</i> STM	)298
Scarification	
Hull-imposed dormancy in rice 00	0057
Scatchard analysis	
Performance evaluation of tailor made microspheres as sensing layer responsive to 04 residual chloramphenicol in food matrices	)493
Scattering forces	
Gradient and scattering forces on a Kerr Nanosphere 0:	)535
Schistosoma japonicum	
Vaccine development against the Philippine strain of <i>Schistosoma japonicum</i> 02	)234
Schistosomiasis japonica	
Studies on <i>Schistosomiasis japonica</i> and Saponins 0:	)509
Schoolchildren	

An Assessment of the selenium status of iodine-deficient and non-iodine deficient 0434 Filipino children

Science and technology

(	Coconut fiber reinforced composite new technology approach to age-old solutions	0587
Ι	Development of Philippine tropical fabrics from indigenous sources	0588
I	Effects of applied voltage on the mean diameter of electrospun polyaniline (PANI)- elastomeric adhesive fiber	0589
I F	Electrochemical synthesis and corrosion performance of polypyrrole and poly(pyrrole-co-aniline) films on copper	0590
ł	Evaluation of the effectiveness of fabric stain removers	0591
( 1	Google earth: a tool for eliciting spatial information about forest degradation from ocal people	0592
ł	Halogen-free, imidazolium based ionic liquids for organic and inorganic syntheses	0593
ן ו	Lactic acid fermentation from <i>Jatropha curcas</i> L. press cake and raw cassava starch using <i>Rhizopus oryzae</i> NRRL-395	0594
l	Aicroemulsified hybrid fuel from jatropha and coconut oils	0595
l i	Microwave-assisted reaction: a cleaner and efficient method for the synthesis of ndazoles and benzimidazoles	0596
I ł	Production of particleboard from <i>Nymphaea stellata willd</i> (water lily) fiber with high-density polyethylene (HDPE) and polystyrene (PS) as binders	0597
I	Properties and performance of MMSU hydrous biofuel	0598
I	Rapid synthesis under mild conditions of an acrylic diamide N, N, N', N'T etrabutylphthalamide, a potential antimicrobial agent	0599
Ĭ	Yield potential of rain tree fruit (Samanea saman Merr.) as feedstock for biofuel production	0600
Sci	entific productivity	
Ι	nternational scientific productivity of selected universities in the Philippines	0480
Sci	reening technique	
H t	Kinetics of iron in the development of rapid screening technique for iron toxicity olerance in rice	0066
Sea	a breeze	
I N	Effect of the diurnal variation of the convective boundary layer height over Metro Manila on pollutant concentration	0315
Sea	a-salt fertilizer	
I f r	Profitability of Coconut production: an analysis of farm size, rental, cost, inorganic Pertilization, and copra price during a five-year cropping cycle period (technology notes)	0095
Sea	ahorse embryogenesis	
I	Histo-physiological development in the gestation of the male seahorse,	0181

Hippocampus comes Cantor 1850

Seaweeds	
Marine fungi from <i>Kappaphycus Alvarezii</i> and <i>K. Striatum</i> : potential causative agents of ice-ice disease in farmed seaweeds	0194
Technological improvements in commercial <i>Eucheuma</i> cultivation: a short communication	0402
Secondary forest	
Silvical characteristics of pure and mixed stands in permanent field laboratory area (PFLA 3), Mt. Makiling Forest Reserve	0354
Secure	
Secure domination in a network: a protection strategy	0420
Security	
Design and development of smart karwats: a GSM based car security system with GPS tracking capability	0285
Sediment yield	
Predicting the effects of land use on runoff and sediment yield in selected sub- watersheds of the manupali river using the Arcswat model	0093
Sedimentation	
Sedimentation rate in fringing reefs of Honda Bay, Puerto Princesa City, Palawan, Philippines with reference to coral reef condition	0335
Sedimentation rate	
Sedimentation rate estimates in Sorsogon Bay, Philippines using <sup>210</sup> Pb method	0270
Sediments	
Microbial fuel cell: a new renewable source of energy: Pasig river sediments for lighting	0297
Seed bed preparation	
Easy methods of propagating citrus	0037
Seed dormancy	
Hull-imposed dormancy in rice	0057
Seed extraction	
Easy methods of propagating citrus	0037
Seed hull	
Hull-imposed dormancy in rice	0057
Seed treatment	
Easy methods of propagating citrus	0037
Seeding technique	
Technological improvements in commercial <i>Eucheuma</i> cultivation: a short communication	0402

Selar boops	
Management of <i>Vibrio</i> infections in fishery industry by antibiotic susceptibility profiling	0192
Selenium status	
An Assessment of the selenium status of iodine-deficient and non-iodine deficient Filipino children	0434
Self-sufficiency	
The rice problem in the Philippines: trends, constraints, and policy imperatives	0106
SEM	
Fabrication of anodic alumina oxide templates and their use for the electrosynthesis of polythiophene nanowires	0254
Preparation and investigation of spin self assembled multilayer film of poly(3,4 ethylenedioxythiophene): poly(4 styrenesulfonate) and poly(alylamine hydrochloride) as organic light-emitting diode	0302
Semiconductor edifices	
High-resolution differential thermography of semiconductor edifices	0538
Sensible heat	
Heat pump drying of onion (Allium cepa)	0056
Sensitivity	
Surface modified zinc oxide: a potential smoke sensor at ambient condition	0572
Sensor networks	
A tilt, soil moisture, and pore water pressure sensor system for slope monitoring applications	0311
Sensors	
Conductive polymers as host matrices for the dispersion of gold nanoparticles with electrocatalytic properties	0244
Sequencing	
Genetic polymorphism of CYP2D6*10 gene among Filipinos	0470
Sericulture	
Cocoon yield and quality of silkworm fed with leaves harvested from mulberry grown under conventional, LEISA, and organic agro-ecosystem manipulations	0015
Sex chromosomes	
Sex preselection in animals: current methods and applications	0507
Sexual dimorphism	
Sexual dimorphism and morphometric differentiation among colormorphs of the swordtail fish <i>Xiphophorus helleri</i>	0224
SFRs	
Water quality analysis and utilization of small farm reservoirs (SFRs) for aquaculture in Region III	0277

Shallow marine waters

Review of the biodiversity of Southern Philippine Seas	0395
Sheep	
Application of non-conventional acupuncture in sheep, cattle and water buffaloes	0605
Shell dimensions	
The relationship of shell dimensions and shell volume to live weight and soft tissue weight in the mangrove clam, <i>Polymesoda erosa</i> (Solander, 1786) from Northern Australia	0221
Shell morphology	
Larger forms in lophiotoma: four new species described in the Philippines and three from elsewhere in the Indo-Pacific	0188
Shell shape	
Relative warp analysis and correlation analysis based on distances to study morphological variations in the shell shape of <i>Pomacea canaliculata</i> (Lamarck) found in Iligan City	0222
Shell volume	
The relationship of shell dimensions and shell volume to live weight and soft tissue weight in the mangrove clam, <i>Polymesoda erosa</i> (Solander, 1786) from Northern Australia	0221
Short tandem repeat	
Evaluation and in-house validation of five DNA extraction methods for PCR-based STR analysis of bloodstained denims	0467
Short tandem repeat markers	
Resolving questioned paternity issues using a Philippine genetic database	0504
Shrimp	
Unraveling shrimp immunity by RNA interference technology	0232
SHV	
Occurrence of SHV and TEM genes in phenotipically screened-positive extended spectrum ß-lactamases (ESBLS) producing organisms isolates from selected tertiary hospitals (2008)	0206
Side-chain polymers (SCP)	
Side-chain polymer as matrix in cholesteric liquid crystals/polymer composites	0271
Sierpinski carpets	
On the hausdorff dimension of sierpinski carpets	0426
Siganus fuscescen	
Population structure and reproductive biology of <i>Siganus fuscescens</i> Houttuyn 1782 (Perciformes, Siganidae) in Pujada Bay, Southeastern Mindanao, Philippines	0214
Sign reversal	
Double sign reversal of the hall voltage in $Bi_2Sr_2CaCu_2O_{8+\hat{l}'}$ thin film	0523

Silicon	
Terahertz-time domain spectroscopic (THz-TDS) measurement of moderately- doped silicon using InAs Emitter under magnetic field	0578
Silkworm	
Cocoon yield and quality of silkworm fed with leaves harvested from mulberry grown under conventional, LEISA, and organic agro-ecosystem manipulations	0015
Silvery black porgy	
Spawning and hatching performance of the silvery black porgy <i>Sparidentex hasta</i> under hypersaline conditions	0336
Silvical characteristics	
Silvical characteristics of pure and mixed stands in permanent field laboratory area (PFLA 3), Mt. Makiling Forest Reserve	0354
Similarity coefficient	
Genetic variability within the population of the vulnerable Mindanao endemic Blue- Capped Kingfisher ( <i>Actenoides hombroni</i> ) using polymorphic DNA markers	0178
Single nucleotide polymorphism	
Interleukin 4 -590 C/T gene polymorphism as a genetic marker for atopic asthma in a selected Filipino pediatric population	0479
Single nucleotide polymorphism genotyping of antithrombotic therapy resistance markers using high resolution melt analysis	0508
Single-mode	
Broadband continuum generation in single-mode optical fiber	0517
Single-stranded	
Elastic properties of a biopolymer	0165
Single-walled carbon nanotubes	
<i>In vivo</i> toxicology assessment of sytematically introduced functionalized nanoparticles in mice	0184
Singular graph	
Regular singular and nonsingular graphs of arbitrarily large order exist	0419
A study of singular bipartite graphs	0421
Singular partial differential equations	
On the unique solvability of a volevic system of singular partial differential equations	0429
Singular-value decomposition (SVD)	
SVD vs PCA : comparison of performance in an imaging spectrometer	0573
Sintering	
Structure and mechanical property of MgO-ZrO2 ceramic doped with CeO2	0308
Sinusitis	

Practice patterns of physicians in the management of patients admitted for acute sinusitis in Chong Hua Hospital, January 2003 - June 2006	0498
Site-directed mutagenesis	
Site-directed mutagenesis identifies putative soil-binding residues of <i>Bacillus</i> subtilis 168 endoglucanase	0226
Skew-hermitian	
Decompositions involving quaternion matrices and complex partitioned matrices	0412
Skim milk	
Fermentation kinetics of gelatin-immobilized <i>Lactobacillus plantarum</i> BS using skim milk as substrate	0169
Slime molds	
Occurrence and diversity of myxomycetes (plasmodial slime molds) in Mt. Palay- palay, National Park, Cavite, Philippines	0204
Slope monitoring	
A tilt, soil moisture, and pore water pressure sensor system for slope monitoring applications	0311
Slot blot hybridization	
Comparison of conventional plate assays with DNA-based screening protocols for protease and cellulase production from putative <i>Bacillus</i> isolates	0151
Slow release	
Corn in the Philippines: feeding the population beyond the present	0020
Small farm reservoir	
Water quality analysis and utilization of small farm reservoirs (SFRs) for aquaculture in Region III	0277
Small-world network	
Tracking the dynamic variations in a social network formed through shared interests	0584
Smoke sensor	
Surface modified zinc oxide: a potential smoke sensor at ambient condition	0572
Smoking	
Morbidity changes among smoking clients who consulted at Eastern Visayas Regional Medical Center Family Health Clinic from October 2003 - October 2004	0487
Sn	
Electrochemical synthesis and characterization of poly(3,4- ethylenedioxythiophene)-supported Pd-Sn nanoparticles dispersed on Au electrode for formic acid oxidation	0248
Snails	
High incidence of land snails mortality at Mt. Arayat, Pampanga: an evidence of global warming	0061
Social acceptability	

The efficiency and social acceptability of the constructed wetland of Bayawan City, Negros Oriental	0316
Social capital	
Spill-over effects of rural industrialization on community transformation	0322
Social phenomena	
Philippine social science in the century of biology engaging the biological dimensions of behavioral and social phenomena	0210
Social sciences	
The economic impact of the demographic crisis: its implications on public policy	0601
Eliciting indigenous knowledge system on natural resource management strategies: a case study in the cordillera region, Philippines	0602
Using the capabilities approach to analyze access to information and communication technologies (ICTS) by the poor	0603
Social status	
Women in the December 26 tsunami: how have they coped; how can we help?	0404
Socio-economic	
Socio-economic conditions and perceptions on the conservation of Tubbataha Reefs and vicinity: a households survey in Cagayancillo, Palawan	0320
Socio-economic impacts	
SEAFDEC contribution to the ecological awareness of Philippine Lakes	0397
Socio-economically depressed	
Women in health development: the Mangyans of Mindoro Province	0512
Sodium	
Effects of lahar on the water quality of the rivers and tributaries of Pinatubo volcance	0363
Sodium chloride	
Coconut yield and profitability under two practical fertilizer options: common salt (sodium chloride) and multi-nutrient 14N-5P2O5-20K2O- 15CI-4.5S-0.02B applications on bearing trees (technology notes)	0014
Sodium glucoheptane	
The development of technetium - 99m radiopharmaceuticals: technetium -99m phytate	0361
Soft tissue weight	
The relationship of shell dimensions and shell volume to live weight and soft tissue weight in the mangrove clam, <i>Polymesoda erosa</i> (Solander, 1786) from Northern Australia	0221
Soil binding	
Bacillus subtilis 168 endoglucanase binds to chemical soils under diverse conditions	0138
Soil erosion	
Productivity and soil erosion in various crop cover in the mountainous areas of	0094
Bondoc Peninsula, Philippines	
--	--------
Soil organic matter	
Organic matter residue management for the improvement of soil quality in lowland rice systems	0083
Soil stabilizer	
Rice husk ash as soil stabilizer	0306
Soil-binding domain	
Site-directed mutagenesis identifies putative soil-binding residues of <i>Bacillus</i> subtilis 168 endoglucanase	0226
Solar cells	
Anisotropic surface tecturing of silicon substrate using alkaline solution for solar cell application	0516
Influence of stacked Ge islands on the dark current-voltage characteristics of a diode for solar cell application	0539
Solar energy	
Assessment of renewable energy resource potential and application for decentralized rural electrification using geographic information system (GIS)	0281
Solid phase extraction	
Cyclosporin analysis in blood by automated reserved-phase high performance liquid chromatographic method coupled with solid phase extraction and speed vacuum evaporation	1 0455
Solid state sintering	
Synthesis and characterization of cordierite prepared from mixtures of Philippine Kaolinite Clay, Talc, and other additives	0310
Solitary ant	
Mandibular shape variation in the ants <i>Diacamma rugosum</i> and <i>Pheidologeton</i> diversus philippinus	0193
Soluble glass bolus	
Subsequent effects of intraruminal soluble glass bolus on plasma calcium, phosphorus and magnesium content of grazing does under backyard conditions in selected areas in Nueva Ecija, Philippines	0324
Somatic embryo	
Induction of somatic embryo from cotyledonary tissues of cashew ( <i>Anacardium occidentale</i> L.) by in vitro culture	0185
Somatic embryogenesis	
Tissue cultured avocado ( <i>Persea americana</i> MILLER): a journey from laboratory to field	o 0121
Sooty molds	
Invasion of the buff coconut mealybug (Nipaecoccus nipae) in U.P. Los Baños	0065

campus, elucidation of the confounded	"mealybug burn"	damage and practical
control		

Sorghum	
Region I adopts sweet sorghum as regional strategic commodity	0100
Sorption	
Investigation of arsenate uptake by hydrotalcite at hyperalkaline and elevated temperature conditions	0296
Sorsogon Bay	
Sedimentation rate estimates in Sorsogon Bay, Philippines using <sup>210</sup> Pb method	0270
South China Sea	
Wind stress curl and surface circulation in the South China Sea and the Philippine Sea	0403
Soybean powdered drink	
The effectiveness of the use of soybean powdered drink as supplement to lipid lowering agents vs. lipid lowering agents alone in hypercholesterolemia	0465
Sparassidae	
First description of the male of <i>Heteropoda cyperusiria</i> barrion & litsinger 1995 from the Philippines (Araneae: Sparassidae: Heteropodinae)	0025
Sparidentex hasta	
Spawning and hatching performance of the silvery black porgy <i>Sparidentex hasta</i> under hypersaline conditions	0336
Spawning patterns	
Deriving recruitment and spawning patterns from a survey of juvenile grouper (Pisces: Serranidae) occurrences in the Philippines	0328
Spawning performance	
Spawning and hatching performance of the silvery black porgy <i>Sparidentex hasta</i> under hypersaline conditions	0336
Spear (salapang)	
Stock assessment of commercially important fishes in Naujan Lake	0399
Spear gun (pana)	
Stock assessment of commercially important fishes in Naujan Lake	0399
Species abundance,	
Occurrence and diversity of myxomycetes (plasmodial slime molds) in Mt. Palay- palay, National Park, Cavite, Philippines	0204
Species composition	
A survey of macro-invertebrate gleaning in the Banate Bay Intertidal Area, Eastern Panay Island	0400
Species distribution	
Occurrence and diversity of myxomycetes (plasmodial slime molds) in Mt. Palay-	0204

palay, National Park, Cavite, Philippines	
Species diversity	
Plant species diversity and endemism at dihang dibang biosphere reserve and its surroundings, eastern himalaya biodiversity hotspot	0213
Species richness	
Diversity and status of plants in three mountain ecosystems in Southern Mindanao, Philippines	0314
Species richness, assessment and conservation of some economically important Philippine lycopods	0227
Spectrometer	
An optical remote sensing system based on molecular absorption spectroscopy: I. optical arrangement	0560
Spectrophotometric analysis	
Spectrophotometric analysis of $\alpha$ -tocopherol using emeraldine film	0272
Spectrophotometry	
Nutrition problems of the urban family	0492
Speech recognition	
Speech recognition controller for motorized wheelchair	0307
Speed vacuum	
Cyclosporin analysis in blood by automated reserved-phase high performance liquid chromatographic method coupled with solid phase extraction and speed vacuum evaporation	0455
Sperm	
Sex preselection in animals: current methods and applications	0507
Spermatogenesis	
Histo-physiological development in the gestation of the male seahorse, <i>Hippocampus comes</i> Cantor 1850	0181
Sphenomorphus	
Survey and census of ground lizards in the permanent field laboratory areas (PFLAS) in Mt. Makiling forest reserve	0230
Sphere	
Unit graphs: dimension and span	0431
Spin self-assembly	
Preparation and investigation of spin self assembled multilayer film of poly(3,4 ethylenedioxythiophene): poly(4 styrenesulfonate) and poly(alylamine hydrochloride) as organic light-emitting diode	0302
Spinefoot rabbitfish	
Population structure and reproductive biology of Siganus fuscescens Houttuyn 1782	0214

(Perciformes, Siganidae) in Pujada Bay, Southeastern Mindanao, Philippines

Spinophetes spinotergum n. gen., n.sp

Spinophetes SpinotelBain II. Sein, II.Sp	
A new genus and species of stick insect (Phasmatodea: Heteronemiidae: Lonchodinae) from the Philippine Islands	0202
Spiral pump	
Research and development of the spiral pump for water-disadvantaged areas in the Philippines: part I. statistically aided design of prototypes at Los Banos	0101
Research and development of the spiral pump for water-disadvantaged areas in the Philippines: part II. field tests under actual farm conditions in Abra	0102
Sponges	
The shallow water marine sponges (Porifera) of Cebu, Philippines	0398
Spot-on-Iawn antimicrobial assay	
Simple and rapid screening of antimicrobials in feed samples	0225
Sprague-Dawley	
Comparative treament of <i>Pseudomonas aeruginosa</i> burn wound infection using bacteriophage MB08 and antibiotics	0150
Sputum	
Community-based surveillance for drug resistance of mycobacterium tuberculosis in selected areas in the Philippines	0445
Sputum examination	
The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0439
SSB	
Biodegradation of banana stalks and sweet sorghum bagasse under solid state culture of <i>Pleurotus sajor caju</i>	0140
SSR	
Genetic diversity analysis of Philippine maize inbred lines using microsatellite markers	0053
Mapping quantitative trait loci associated with resistance to preharvest sprouting in wheat	0070
Stabilizing agent	
Halogen-free, imidazolium based ionic liquids for organic and inorganic syntheses	0593
Stable angina	
Effect of trimetazidine on left ventricular ejection fraction and time to develop 1mm ST depression in patients with chronic stable angina: a meta-analysis	0462
Stachytarpheta jamaicensis	
Comparison of pollen abortiveness in four weed species treated with mercuric chloride	0152

Stackelberg game

A bi-level multi-period optimization model for multiple feedstock bioenergy supply chains	0283
Stalk	
The fecundity and fertility of field collected and corn stalk collected asian corn borer, <i>Ostrinia furnacalis</i> Guenee	0050
Standardization	
Standardization of thermal processes for local foods with emphasis on low-acid foods	0348
Standing and dripping water	
Identification of bacteria isolated from standing and dripping water of Bulalon Cave, Burdeos, Polillo Islands, Quezon Province	0182
Stannous chloride	
The development of technetium - 99m radiopharmaceuticals: technetium -99m phytate	0361
Staphylococcus aureus	
Essential oil content and antibacterial activity of some Philippine plants	0251
In vitro study on the bactericidal effects of freshly prepared colloidal silver	0478
Lemon grass (Cymbopogon citratus)extract: a promising antibacterial juice	0189
Static behavior	
Static behaviors of confined time-arrival operators	0569
Statistical mechanics	
Thermodynamics of a one-dimensional gravitational gas in a uniform external field	0580
Statistics	
Development of a Beowulf-Class High Performance Computing System for Computational Science Applications	0604
Status	
Diversity and status of butterflies in Maitum Village, Tandag, Surigao del Sur, Philippines	0158
Sterility	
Antigonadotropic effects of precocene II: allaticidal action in females of Nilaparvata lugens (Stal)	0608
Steroids	
Isolation and identification of constituents from the antitubercular DCM fraction from the leaf extract <i>Premna odorata</i> blanco	0482
Stick insect	
A new genus and species of stick insect (Phasmatodea: Heteronemiidae: Lonchodinae) from the Philippine Islands	0202
Stigmaeidae	
Some Philippine raphignathoidea (acari). IV. the genera Ledermuelleriopsis	0090

willmann and Zetzellia oudemans (stigmaeidae) Stimulated raman scattering Frequency conversion of the 355 nm Nd:YAG laser via stimulated raman scattering 0534 in hydrogen A Nd:YAG laser-pumped hydrogen raman shifter with capillary waveguide 0552 Stochastic resonance (SR) 0291 Effects of noise coherence on stochastic resonance enhancement in a bithreshold system Storage life Improving quality and shelf-life of vegetables and fruits by evaporative cooling 0058 storage Strategies Emerging swine production technologies to keep pace with increasing population 0044 Street soil Environmental mutagenesis, soil studies 0250 Stroke The rifasaf project: a case-control study on risk factors for stroke among Filipinos 0505 Strongylodon macrobotrys Foliar anatomy of jade vine Strongylodon macrobotrys A. Gray (fabaceae): 0171 implications of ground and vascular tissue organization to growth and development Structure Structure and mechanical property of MgO-ZrO<sub>2</sub> ceramic doped with CeO<sub>2</sub> 0308 Subcellular localization Subcellular localization of cadmium in Chlorella vulgaris Beijerinck Strain Bt-09 0229 Subsidence Compaction rates and paleo-sea levels along the delta complex north of Manila 0359 Bay, Luzon Island, Philippines Subterranean environment Identification of bacteria isolated from standing and dripping water of Bulalon 0182 Cave, Burdeos, Polillo Islands, Quezon Province Sugar 0258 Fortification of sugar with vitamin A-technology generation and transfer Sugarcane bagasse A research on the production of bonded particle board utilizing sugarcane bagasse 0305 Sugpo Assessment on the estuarine areas of Camotes Islands, Central Philippines: their 0327 ecology and prospects for milkfish (Chanos chanos) and prawn (Penaeus monodon) industry

Suha (Citrus grandis L.)	
Studies on the utilization of citrus wastes	0273
Sulfate	
Effects of lahar on the water quality of the rivers and tributaries of Pinatubo volcano	0363
Sulfate reducing bacteria	
Laboratory scale bioremediation of copper containing wastewater from gold smelting using biogenic hydrogen sulfide	0187
Sulfuric acid	
Effect of dopant ions on the electrical conductivity and microstructure of polyaniline (emeraldine salt)	0246
Superconductivity	
Synthesis of bulk superconducting magnesium diboride	0575
Supergraph	
Vertex cover of some supergraphs of planar grid	0432
Supermale tilapia	
Developmental Biology of the Supermale YY Tilapia ( <i>Oreochromis niloticus</i> ): histogenesis of the reproductive system	0156
Superstition	
A study on the common superstitious health beliefs and practices among randomly selected pregnant women in Punta Engaño, Mactan, Cebu	0511
Surface analysis	
Conductive polymers as host matrices for the dispersion of gold nanoparticles with electrocatalytic properties	0244
Surface currents	
Wind stress curl and surface circulation in the South China Sea and the Philippine Sea	0403
Surface deformations	
Measurement of three-dimensional deformations by phase-shifting digital holographic interferometry	0547
Surface mold application	
Clinical techniques for brachytherapy of head and neck tumors	0441
Surgical	
Mechanical, chemical and surgical methods of contraception	0483
Surveillance	
The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0440

Survey

Exclusion of <i>Planococcus lilacinus</i> (cockerell) from the list of Philippine bamboo pests based on field and laboratory studies	0045
Sus scrofa domestica	
Antibody titer response of cattle (Bos taurus) vaccinated with oil and aluminum adjuvanted FMD vaccine (Serotype $O_2$ , $A_{24}$ and $C_3$ )	0005
Sustainability	
A bi-level multi-period optimization model for multiple feedstock bioenergy supply chains	0283
Sustainable	
Sustainable marine fisheries production in the Philippines	0339
Sustainable use	
Use of edible forest plants among indigenous ethnic minorities in cat tien biosphere reserve, Vietnam	0325
SWAT modeling	
Predicting the effects of land use on runoff and sediment yield in selected sub- watersheds of the manupali river using the Arcswat model	0093
Sweet potato	
High yielding sweet potato variety for Mindanao	0128
Sweet sorghum	
Region I adopts sweet sorghum as regional strategic commodity	0100
Sweet sorghum jaggery as alternative media for the production of commercial yeast	0117
Swine, production technologies	
Emerging swine production technologies to keep pace with increasing population	0044
SWOT analysis	
Status, prospects, and strategic options of buntal fiber industry in Marinduque	0112
Symmetric designs	
Symmetric designs from a rahilly family of pre-difference sets of orders 2 and 3	0423
Symmetry reductions	
Symmetry reductions and a posteriori finite element error estimators for bifurcation problems	0424
Symptom distress	
Hypertensive patients' symptoms distress and quality of life	0474
Synodontis nigrita	
Food and feeding habits of Synodontis nigrita from the Osun River, SW Nigeria	0172
Synthesis	
Microwave-assisted reaction: a cleaner and efficient method for the synthesis of indazoles and benzimidazoles	0596
Synthesis and characterization of cordierite prepared from mixtures of Philippine	0310

Kaolinite Clay, Talc, and other additives	
Synthesis of bulk superconducting magnesium diboride	0575
Synthesized chemically	
Development of electronically controlled environment for the fast decomposition of organic fertilizer	0286
Systematic sound	
Influence of music on the growth of koi carp, Cyprinus carpio (Pisces:Cyprindae)	0331
T-S profile	
Movement of water across passages connecting Philippine inland sea basins	0389
Tagetes sp.	
Alternative management strategies against the rice root-knot nematode, <i>Meioidogyne graminicoia</i> in rice-onion system	0003
Tahara [6]	
On the unique solvability of a volevic system of singular partial differential equations	0429
Talisay	
Effect of mykovam, beneficial indigenous microbes and compost for improved growth of <i>Terminalia catappa</i> in an acidic infertile soil	0161
Preliminary screening of methanolic extracts of kalingag ( <i>Cinnamomum mercadoi</i> Vindal) and Talisay ( <i>Terminalia catappa</i> ) against methicillin resistant Staphylococcus aureus (MRSA)	0217
Taxa	
Floristic inventory of the Luneta Park, Manila	0170
Taxonomy	
Exclusion of <i>Planococcus lilacinus</i> (cockerell) from the list of Philippine bamboo pests based on field and laboratory studies	0045
Occurrence and diversity of myxomycetes (plasmodial slime molds) in Mt. Palay- palay, National Park, Cavite, Philippines	0204
Preliminary taxonomic and image catalogue of copepod species (crustacea, copepoda) from the neritic waters of Northern Mindanao, Philippines	0218
Species account of marine diatoms of the genus <i>Pseudo-nitzschia</i> in San Pedro Bay, Philippines	0321
Translocation of the Clupeid <i>Sardinella tawilis</i> to another lake in the Philippines: a proposal and ecological considerations	0231
Technetium - 99m radiopharmaceuticals	
The development of technetium - 99m radiopharmaceuticals: technetium -99m phytate	0361
Technetium -99m phytate	
The development of technetium - 99m radiopharmaceuticals: technetium -99m	0362

phytate

Teledensities	
Using the capabilities approach to analyze access to information and communication technologies (ICTS) by the poor	0603
Telehealth	
Batangas health E-center	0282
TEM	
Fabrication of electrocatalyst based on PEDOT-PSS supported Pd nanoparticles for ethanol electro-oxidation	0256
Occurrence of SHV and TEM genes in phenotipically screened-positive extended spectrum ß-lactamases (ESBLS) producing organisms isolates from selected tertiary hospitals (2008)	0206
Temperature	
Movement of water across passages connecting Philippine inland sea basins	0389
The reduction Behavior of nickel in high-iron laterites under $CO/CO_2/N_2$ atmospheres	0304
Temperature controller	
Development of Philmech rice hull-fed furnace system for heating mechanical dryers	0033
Temperature gradient	
Stretching single molecular DNA by temperature gradient: a white noise functional approach	0570
Tempering	
Tempering and annealing in a verdier-stockmayer polymer	0576
Template synthesis	
Fabrication of anodic alumina oxide templates and their use for the electrosynthesis of polythiophene nanowires	0254
Temporal coherence	
Temporal coherence behavior of a Nd:YAG pumped waveguide raman shifter	0577
Tendons	
The role of radiation in tissue banking	0506
Tenuipalpidae	
A review and revised checklist of the mites (acari) in B.P. Gabriel's "insects and mites injurious to Philippine crop plants"	0104
A review of the genus ultratenuipalpus mitrofanov (acari:tenuipalpidae) with descriptions of two new species from the Philippines	0105
Tephritidae	
Morphometric analysis and DNA barcoding of fruit flies Bactroceraoccipitalis (Bezzi) and B. philippinensis drew and hancock (Diptera: Tephritidae) from Cavite	0201

and Davao del Norte

Terahertz-time domain spectroscopic (THz-TDS)	
Terahertz-time domain spectroscopic (THz-TDS) measurement of moderately- doped silicon using InAs Emitter under magnetic field	0578
Tetracycline	
Mutagenicity, clastogenicity and antimutagenicity of expressions, decoctions, tablet and syrup preparations from "lagundi" ( <i>Vitex negundo</i> L.)	0490
Tetranychidae	
A review and revised checklist of the mites (acari) in B.P. Gabriel's "insects and mites injurious to Philippine crop plants"	0104
Theramenes mandirigma n. sp.	
A new species of stick insect (Phasmatodea: Heteropterygidae: Obriminae: Obrimini) from Cebu Island, Philippines	0079
Therapeutic regimen	
Determinants of compliance to therapeutic regimen among selected Filipino juvenile diabetics	0457
Therapon plumbeus	
Parasitic crustaceans in fishes from some Philippine lakes	0390
Thermal	
Heat pump drying of onion (Allium cepa)	0056
Thermal death time (TDT)	
Standardization of thermal processes for local foods with emphasis on low-acid foods	0348
Thermal mapping	
High-resolution differential thermography of semiconductor edifices	0538
Thermodynamics	
Thermodynamics of a one-dimensional gravitational gas in a uniform external field	0580
Thickness swelling (TS)	
Utilization of acacia mangium for cement-bonded board manufacture	0123
Thinber	
The effectiveness of thinber on weight reduction as an adjunct to low calorie diet prescription among adults: a randomized controlled study	0466
Thiodininae	
A new species of the genus <i>Bavia</i> simon, 1877 (Araneae: Salticidae) from the highlands of Sagada, Mountain Province, Luzon Island, Philippines	0080
Threatened plants	
Assessment of genetic diversity in <i>Tectona philippinensis</i> Benth. & Hook. f. (Verbenaceae) inferred from <i>TRNL</i> intron sequences	0137

THz radiation	
THz radiation from high-Tc superconducting materials and its applications	0582
Ti plant	
PNRI mutant variety: Cordyline 'Afable'	0091
Ti:Sapphire femtosecond laser	
Two-photon optical beam-induced current microscopy of light-emitting diodes	0585
Tichocanthes	
Molecular cloning of cysteine protease inhibitors from four endemic Philippine plants	0198
Tie-tie method	
Technological improvements in commercial <i>Eucheuma</i> cultivation: a short communication	0402
Tilapia	
The status of tilapia aquaculture in Lake Sebu, South Cotabato	0337
Total mercury in three fish species sold in a Metro Manila Public Market: monitoring and health risk assessment	0276
Time series analysis	
Tracking the dynamic variations in a social network formed through shared interests	0584
Time-of-arrival (TOA)	
Static behaviors of confined time-arrival operators	0569
Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan	
State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan	0323
TIntinnopsis	
Abundance, composition and distribution of Phytoplankton in Calamianes, Palawan	0129
Tissue allografts	
The role of radiation in tissue banking	0506
Tissue culture	
Dwarf banana now tissue-cultured	0036
Tissue cultured avocado ( <i>Persea americana</i> MILLER): a journey from laboratory to field	0121
Titin	
Elastic properties of a biopolymer	0165
TLC	
Fruticose lichens from selected sites in Luzon as sources of biologically active lichen acids	0176
Tobacco	
Greenhouse gas emissions of tobacco flue-curing process in the Philippines	0295

Technologies for profitable tobacco production	0119
Tobacco farming	
A descriptive model of cropping decision making application to crop diversification in irrigated rice farms	0026
Tomato	
Molecular and phenotypic studies of resistance genes introgressed from wild tomato ( <i>Lycopersicon chilense</i> ) to cultivated tomato ( <i>Lycopersicon esculentum</i> ) against tomato leaf curl virus isolate from the Philippines	0073
Tomato growing	
A descriptive model of cropping decision making application to crop diversification in irrigated rice farms	0026
Tomato leaf curl virus	
Molecular and phenotypic studies of resistance genes introgressed from wild tomato ( <i>Lycopersicon chilense</i> ) to cultivated tomato ( <i>Lycopersicon esculentum</i> ) against tomato leaf curl virus isolate from the Philippines	0073
Topological degree	
On a lesile-type predator-prey model with diffusions	0405
Topology	
Onset of small-world behavior in topologically evolving networks	0558
Total area covered	
State of mangroves in Tiniguiban Cove, Puerto Princesa Bay, Puerto Princesa City, Palawan	0323
Total domination	
Secure domination in a network: a protection strategy	0420
Total economic value	
Will mangrove reforestation provide net benefits: a case in Sibunag, Guimaras	0318
Total plate count	
Microbial load assessment of some "one town one product (otap)" food products of Ilocos Norte	0196
Tourist	
Some butterflies of Boracay Island	0278
Toxicity	
Effects of arbuscular mycorrhizal fungi inoculation on growth and Cu uptake and toxicity of <i>Desmodium cinereum</i> (Kunth) D.C.	0162
Phytochemical screening and toxicity of some green leafy vegetables consumed in Batac, Ilocos Norte	0212
Toxoglossate mollusc	
Larger forms in lophiotoma: four new species described in the Philippines and three from elsewhere in the Indo-Pacific	0188

toxR	
Local Vibrio isolates exhibit molecular characteristics distinct from reference V. harveyi and V. campbellii strains	0191
Tracer	
Isotope and geochemical methods in water resources assessment and environmental management	0541
Trade liberalization	
The rice problem in the Philippines: trends, constraints, and policy imperatives	0106
Traditional Chinese Medicine	
Histo-physiological development in the gestation of the male seahorse, <i>Hippocampus comes</i> Cantor 1850	0181
Trait disparity	
Relative warp analysis and correlation analysis based on distances to study morphological variations in the shell shape of <i>Pomacea canaliculata</i> (Lamarck) found in Iligan City	0222
Trans fatty acid	
Determination of <i>Trans</i> fatty acid in virgin coconut oil and other fats and oils by gas chromatography	0342
Transcription factors	
Transgenic rice plants overexpressing host transcription factors Rf2A and Rf2B are tolerant to tungro disease	0122
Transesterification	
Preliminary investigation of <i>Calophyllum inophyllum</i> (Bitaog) as a potential source of biofuel	0301
Transferrin, F1 cross	
Geographical distribution and frequency of albumin, transferrin, and $\alpha$ -2 microglobulin alleles among anglo nubian, native goats and their F <sub>1</sub> crosses	0054
Transformation matrix	
Effect of filter arrangement in the estimation accuracy of an imaging spectrometer	0526
Transgenic crops	
Agricultural biotechnology trends and challenges	0130
Transgenic rice	
Transgenic rice plants overexpressing host transcription factors Rf2A and Rf2B are tolerant to tungro disease	0122
Transglutaminase	
Unraveling shrimp immunity by RNA interference technology	0232
Transient ischemic attack (TJA)	
The rifasaf project: a case-control study on risk factors for stroke among Filipinos	0505
Transition parenchyma	

Foliar anatomy of jade vine <i>Strongylodon macrobotrys</i> A. Gray (fabaceae): implications of ground and vascular tissue organization to growth and development	0171
Transnasal	
Clinical techniques for brachytherapy of head and neck tumors	0441
Trash fish	
The influence of body weight and diet on the ammonia excretion of the African catfish <i>Clarias geriepinus</i>	0062
Treadle pump	
Reducing fossil fuel emission using treadle pump technology	0303
Treatment adherence	
The relation of family function and adherence to tuberculosis treatment	0503
Treatment outcome	
A comparative study on the treatment outcome of tuberculosis patients managed in a PPM-DOTS center by type of treatment partners	0448
Treatment success	
Treatment outcomes of pulmonary TB patients enrolled at the Unilab-DOTS Center	0375
Tree measurement technique	
Survey of trees using ArcGIS offset line and digicam tree measurement techniques	0356
Triangle	
On triangle graphs	0430
Triangle cacti	
On triangle graphs	0430
Tricalcic phosphate	
Use of enriched live prey in promoting growth and maturation of tiger shrimp ( <i>Penaeus monodon</i> )	0341
Trichodesmium	
Abundance, composition and distribution of Phytoplankton in Calamianes, Palawan	0129
Trichomonas vaginalis	
Genetic diversity of Philippine <i>Trichomonas vaginalis</i> isolates using the 5.8S ribosomal RNA gene	0177
Trichomoniasis	
Genetic diversity of Philippine <i>Trichomonas vaginalis</i> isolates using the 5.8S ribosomal RNA gene	0177
Trichromothrips sp.	
Survey, identification and life history of Anthurium thrips	0113
Tridymite	
Characteristics of Pangasinan zeolite as a molecular sieve for bioethanol	0284
Triglyceride	

The effect of virgin coconut oil on the cholesterol levels of patients with hypercholesterolemia	0463
Trimetazidine	
Effect of trimetazidine on left ventricular ejection fraction and time to develop 1mm ST depression in patients with chronic stable angina: a meta-analysis	0462
Trimethylamine	
Fish freshness analysis using a polyaniline/nylon composite-based chemiresistor sensor	0343
Triumfetta	
Molecular cloning of cysteine protease inhibitors from four endemic Philippine plants	0198
Troides rhadamantus	
A taxonomic list of butterflies (lepidoptera:papilionoidea and hesperioidea) from Mount Banahao de Lucban, Quezon Province, Philippines	0118
Tropical limnology,	
Zooplankton spatial abundance and distribution in the West Bay of Laguna de Bay (Philippines) with notes on potential implications to food and health security	0237
Truss network	
Sexual dimorphism and morphometric differentiation among colormorphs of the swordtail fish <i>Xiphophorus helleri</i>	0224
Trypauchenopsis intermedia	
The goby Trypauchenopsis intermedia Volz 1903 (Gobiidae) from the Philippines	0180
Trypsacum laxum	
Survey of alternate host plants of the Asian corn borer Ostrinia furnacalis (Guenee): maramais Trypsacum laxum, in Pangasinan	0114
Tsaang gubat	
Effects of antioxidant extracted from leaves of "banaba" ( <i>Lagerstroemia speciosa</i> , <i>L</i> .), mangosteen ( <i>Garcinia mangostana</i> , <i>L</i> .) and "tsaang gubat" ( <i>Ehretia microphylla L</i> .) on the oxidation stability of biodiesel	0290
Tsunami	
A post-tsunami assessment of coastal living resources of Langkawi Archipelago, Peninsular Malaysia	0391
Women in the December 26 tsunami: how have they coped; how can we help?	0404
Tubang bakod	
Optimization of <i>Jathropha curcas</i> (tubang bakod) and <i>Calophyllum inophyllum</i> (bitaog) as a viable source of activated carbon for methylene blue adsorption	0299
Tubbataha Reef	
Focal benthic mollusks (Mollusca: Bivalvia and Gastropoda) of selected sites in Tubbataha Reef National Marine Park, Palawan, Philippines	0384

Tubbataha reefs

Socio-economic conditions and perceptions on the conservation of Tubbataha Reef and vicinity: a households survey in Cagayancillo, Palawan	s 0320
Tuberculosis	
The clinical epidemiology of pulmonary paragonimiasis and tuberculosis in Sorsogon, Philippines: part I. misdiagnosis of pulmonary parafonnimiasis and tuberculosis in Sorsogon, Philippines	0440
A comparative study on the treatment outcome of tuberculosis patients managed in a PPM-DOTS center by type of treatment partners	0448
Isolation and identification of constituents from the antitubercular DCM fraction from the leaf extract <i>Premna odorata</i> blanco	0482
Treatment outcomes of pulmonary TB patients enrolled at the Unilab-DOTS Center	r 0375
Turbulence	
Derivation of third order MHD equations	0519
Onset of turbulence in planar and circular pipe	0559
Turnover rate	
A survey of macro-invertebrate gleaning in the Banate Bay Intertidal Area, Eastern Panay Island	0400
Turridae	
Larger forms in lophiotoma: four new species described in the Philippines and three from elsewhere in the Indo-Pacific	e 0188
Turrinae	
Evaluation of Philippine Gemmula: forms related to G speciosa and G kieneri	0167
Two-diode model	
Influence of stacked Ge islands on the dark current-voltage characteristics of a diode for solar cell application	0539
Two-photon optical beam-induced current (2P-OBIC)	
Two-photon optical beam-induced current microscopy of light-emitting diodes	0585
Ultrafiltration (UF)	
Polymeric membranes for pressure-driven filtration	0268
Ultratenuipalpus	
A review of the genus ultratenuipalpus mitrofanov (acari:tenuipalpidae) with descriptions of two new species from the Philippines	0105
Ultraviolet spectra	
Hypoglycemic activity determination and characterization of potentially active metabolite(s) from the root crop <i>Smallantus sonchifolius</i> (yacon)	0372
Uncaria perrottetii	
Antimicrobial activity of <i>Chromolaena odorata</i> (L. f.) King & Robinson and <i>Uncaria perrottetii</i> (A. Rich) Merr. <i>extracts</i>	0131

UNESCO

A multicultural teaching framework for physics	0550
Uniseriate	
The fruit anatomy of <i>Moringa oleifera</i> Lam: a potential plant for healthy active ageing	0175
Unitary	
Decompositions involving quaternion matrices and complex partitioned matrices	0412
Unsaturated polyester	
Development and production of Mt. Pinatubo ash artwares	0313
Unsupported Pb-210	
Sedimentation rate estimates in Sorsogon Bay, Philippines using <sup>210</sup> Pb method	0270
Unwanted pregnancies	
Probing the decisions behind induced abortion in the Philippines	0502
Upland community development	
Productivity and soil erosion in various crop cover in the mountainous areas of Bondoc Peninsula, Philippines	0094
Upland crops	
Water management for improved post-rice production of upland crops in irrigated paddies	0126
Upland forest	
Carbon storage and sequestration potential of upland and mangrove forest ecosystem in Binahaan Watershed and Padre Burgos Quezon	0349
Urbanization	
Relative sea level changes and worsening floods in the Western Pampanga Delta: causes and some possible mitigation measures	0366
Urchin, Green	
Effects of UV -C on the masking behavior of the green urchin <i>Salmacis sphaeroides</i> (Linnaeus, 1758)	0164
Urea-Formaldehyde (UF) resin	
A research on the production of bonded particle board utilizing sugarcane bagasse	0305
Urinary iodine	
Method validation for the determination of iodine in urine by ammonium persulfate digestion with spectrophotometric detection of the Sandell-Kolthoff reaction	0344
Urine	
Analysis of ecstasy in human urine by high performance liquid chromatography	0433
Analysis of ecstasy in urine using gas chromatography with mass spectrometry	0240
Development of biochemical procedures for the diagnosis of genetic disorders	0155
Method validation for the determination of iodine in urine by ammonium persulfate	0344

digestion with spectrophotometric detection of the Sandell-Kolthoff reaction	
Useful mushrooms	
Wild genetic useful mushroom resources of Central Luzon, as sources of nutriceuticals	0127
Uses	
Species richness, assessment and conservation of some economically important Philippine lycopods	0227
V-cycle	
Symmetry reductions and a posteriori finite element error estimators for bifurcation problems	0424
Vaccine development	
Vaccine development against the Philippine strain of Schistosoma japonicum	0234
Validation	
Method validation for the determination of iodine in urine by ammonium persulfate digestion with spectrophotometric detection of the Sandell-Kolthoff reaction	0344
Pestnet: an inexpensive diagnostics and pest management advisory tool for crop protection practitioners in the Philippines	0086
Validity	
Modified caregiver strain index	0485
Vancomycin.	
Preliminary screening of methanolic extracts of kalingag ( <i>Cinnamomum mercadoi</i> Vindal) and Talisay ( <i>Terminalia catappa</i> ) against methicillin resistant Staphylococcus aureus (MRSA)	0217
Vanda thrips	
Some factors affecting mass rearing of the <i>Vanda</i> thrips, <i>Dichromothrips corbetti</i> (priesner) (thysanoptera: thripidae)	0047
Variationally inspired perturbation theory (VIPT)	
A variational perturbation approach	0586
Varietal improvement	
Development of improved varieties of mungbean (NSIC Mg14 and NSIC mg15)	0032
Varieties	
High yielding sweet potato variety for Mindanao	0128
VCSEL/RCE	
Growth of GaAs-based VCSEL/RCE structures for optoelectronic applications via molecular beam epitaxy	0536
Vector space	
Unit graphs: dimension and span	0431
Vegetables	

Improving quality and shelf-life of vegetables and fruits by evaporative cooling storage	0058
Velocity	
Numerical investigation of non-homologous collapse of the one-dimensional gravitational gas	0555
Venomous snail	
Larger forms in lophiotoma: four new species described in the Philippines and three from elsewhere in the Indo-Pacific	0188
Ventricular function	
The clinical utility of gated spect in myocardial perfusion imaging	0443
Verbenaceae	
Cultural Management and postharvest handling of lagundi (Vitex negundo L.)	0454
Pharmacognostical studies on Vitex Negundo L.	0494
Verdier-stockmayer polymer	
Tempering and annealing in a verdier-stockmayer polymer	0576
Vermicompost produced	
Studies on the production and utilization of vermicompost produced with the African Nightcrawler ( <i>Eudrilus eugeniae</i> ) in the Philippines	0228
Vertebrates	
The avifauna of Mt. Haponhaponon, Mantikil, Siaton, Negros Oriental: with notes on other vertebrates	0312
Vertex cover	
Vertex cover of some supergraphs of planar grid	0432
Vertex covering number	
Vertex cover of some supergraphs of planar grid	0432
Vertices	
On construction of a quasi-regular self-complementary graph	0407
Veterinary medicine	
Application of non-conventional acupuncture in sheep, cattle and water buffaloes	0605
The modified horn ring method as a tool in determining the age of carabao	0606
Vetiveria zizanioides	
Essential oil content and antibacterial activity of some Philippine plants	0251
Viability	
Fermentation kinetics of gelatin-immobilized <i>Lactobacillus plantarum</i> BS using skim milk as substrate	0169
Vibrio	
Local Vibrio isolates exhibit molecular characteristics distinct from reference V. harveyi and V. campbellii strains	0191

Management of <i>Vibrio</i> infections in fishery industry by antibiotic susceptibility profiling	0192
Vibrio sp.	
Bioluminescent bacteria as bioindicator of marine environmental stress in Iligan City	0144
Village-scale ethanol production	
Properties and performance of MMSU hydrous biofuel	0598
Virgin coconut oil	
Determination of <i>Trans</i> fatty acid in virgin coconut oil and other fats and oils by gas chromatography	0342
The effect of virgin coconut oil on the cholesterol levels of patients with hypercholesterolemia	0463
Virulence factor	
Cuticle-degrading enzyme activity of <i>Metarhizium anisopliae</i> (METSCH.) Sorok. isolates pathogenic to asian corn borer larvae	0023
Vitamin A	
Radioisotopes as tools in food and nutrition research	0347
Vitamin A fortification	
Fortification of sugar with vitamin A-technology generation and transfer	0258
Vitamin C	
Easy methods of propagating citrus	0037
Vitex negundo L.	
Clinical trial of Vitex negundo tablet as antitussive	0442
Cultural Management and postharvest handling of lagundi (Vitex negundo L.)	0454
Mutagenicity, clastogenicity and antimutagenicity of expressions, decoctions, tablet and syrup preparations from "lagundi" ( <i>Vitex negundo</i> L.)	0490
Pharmacognostical studies on Vitex Negundo L.	0494
Pharmacologic and toxicologic studies on lagundi (Vitex negundo, L.)	0495
Phytochemical studies on the leaves of Vitex negundo L. (lagundi)	0496
Vitex negundo L. (lagundi)	
The comparative effects of purified fractions of <i>Vitex negundo L</i> . (lagundi) and crude extracts of <i>Cassia alata L</i> . (akapulko) and <i>Artemisia vulgaris L</i> . (damong maria) on inflammatory processes. <i>In vitro</i>	0447
Vivipara costata	
Potential effects of commercial molluscicides used in controlling golden apple snails of the native snail <i>Vivipara costata</i> (Quoy & Gaimard)	0092
Volatile organic compounds	
Chemiresistor electronic nose based on graphite composite for the detection of volatile organic compounds	0243

Volcanic ash	
Development and production of Mt. Pinatubo ash artwares	0313
Volevic system	
On the unique solvability of a volevic system of singular partial differential equations	0429
Voltage	
The effect of deposition time on textured magnesium diboride thick films fabricated by electrophoretic deposition	0289
Vortex motion	
Double sign reversal of the hall voltage in $Bi_2Sr_2CaCu_2O_{8+\hat{1}'}$ thin film	0523
Thermally-activated vortex motion and electrical dissipation in a $Bi_2Sr_2CaCu_2O_{\hat{l}'}$ thin film	0579
Votammetry	
Electrochemical synthesis and corrosion performance of polypyrrole and poly(pyrrole-co-aniline) films on copper	0590
Vowel migration	
Development of feature set, classification implementation and applications for vowel migration/modification in Sung Filipino (Tagalog) texts and perceived intelligibility	0287
Walking stick	
A new genus and species of stick insect (Phasmatodea: Heteronemiidae: Lonchodinae) from the Philippine Islands	0202
Waste animal fats	
ASU to produce biodiesel from waste fats	0008
Waste management	
Bioremediation: a proven and cost effective tool for repairing the environment	0145
Wastewater management	
The efficiency and social acceptability of the constructed wetland of Bayawan City, Negros Oriental	0316
Water absorption	
A research on the production of bonded particle board utilizing sugarcane bagasse	0305
Water absorption (WA)	
Utilization of acacia mangium for cement-bonded board manufacture	0123
Water buffaloes	
Application of non-conventional acupuncture in sheep, cattle and water buffaloes	0605
Water mass	
Movement of water across passages connecting Philippine inland sea basins	0389
Water quality	

The influence of body weight and diet on the ammonia excretion of the African catfish <i>Clarias geriepinus</i>	0062
Water quality analysis and utilization of small farm reservoirs (SFRs) for aquaculture in Region III	0277
Water temperature	
Fish culture in cages in Lake Danao, Cebu	0329
Water transport	
Movement of water across passages connecting Philippine inland sea basins	0389
Watershed	
Zooplankton spatial abundance and distribution in the West Bay of Laguna de Bay (Philippines) with notes on potential implications to food and health security	0237
Watershed protection	
Utilizing balete for riverbank protection and watershed rehabilitation	0125
Waveguide	
A Nd:YAG laser-pumped hydrogen raman shifter with capillary waveguide	0552
Wavelengths	
Effect of filter arrangement in the estimation accuracy of an imaging spectrometer	0526
Weight	
Nucleonic gauges in Philippine industry: current application	0377
Weight percentage moldy kernels (WPMK)	
Determination of weight percentage moldy corn kernels from bulk samples using flatbed scanner	0028
Weight reduction	
The effectiveness of thinber on weight reduction as an adjunct to low calorie diet prescription among adults: a randomized controlled study	0466
Weight specific excretion rates	
The influence of body weight and diet on the ammonia excretion of the African catfish <i>Clarias geriepinus</i>	0062
Welfare	
Cultural diversity: the Filipino client providing culturally sensitive education on breast cancer and early screening	0453
Western therapeutic techniques	
Cultural diversity: the Filipino client providing culturally sensitive education on breast cancer and early screening	0453
Wheat	
Mapping quantitative trait loci associated with resistance to preharvest sprouting in wheat	0070
White noise analysis	

Stretching single molecular DNA by temperature gradient: a white noise functional approach	0570
Whole blood	
Cyclosporin analysis in blood by automated reserved-phase high performance liquid chromatographic method coupled with solid phase extraction and speed vacuum evaporation	0455
Wild mushrooms	
Wild genetic useful mushroom resources of Central Luzon, as sources of nutriceuticals	0127
Wild stocks	
Genetic diversity in wild stocks of the giant freshwater prawn ( <i>Macrobrachium rosenbergii</i> ): implications for aquaculture and conservation	0330
Willingness to pay	
Will mangrove reforestation provide net benefits: a case in Sibunag, Guimaras	0318
Wind stress curl	
Wind stress curl and surface circulation in the South China Sea and the Philippine Sea	0403
Wing morphology	
Wing ecomorphology and flight performance of bats in Pisan Cave, Kabacan, North Cotabato, Philippines	0235
Wing shape	
Outline analysis of wing shape variations in four species of damselflies collected from a stream and waterfalls in Iligan City	0208
Wing venation	
Morphological differences in the shapes and venation of wings of selected dragonfly species	0200
Wireless networks	
A tilt, soil moisture, and pore water pressure sensor system for slope monitoring applications	0311
Women and economy	
The rural women entrepreneurs: their business profiles, entrepreneurial behaviors, management styles, problems and prospects	0280
Women and poverty	
The rural women entrepreneurs: their business profiles, entrepreneurial behaviors, management styles, problems and prospects	0280
Women business managers	
The rural women entrepreneurs: their business profiles, entrepreneurial behaviors, management styles, problems and prospects	0280
Women change agents	

The rural women entrepreneurs: their business profiles, entrepreneurial behaviors, management styles, problems and prospects	0280
Women entreprenuership	
The rural women entrepreneurs: their business profiles, entrepreneurial behaviors, management styles, problems and prospects	0280
Women in business	
The rural women entrepreneurs: their business profiles, entrepreneurial behaviors, management styles, problems and prospects	0280
Women in development	
The rural women entrepreneurs: their business profiles, entrepreneurial behaviors, management styles, problems and prospects	0280
Women vendors	
The rural women entrepreneurs: their business profiles, entrepreneurial behaviors, management styles, problems and prospects	0280
Workshops	
Effectiveness of group consensus activity in improving appropriateness of care for the management of adult asthmatic patients in the ambulatory care unit	0464
Wormlike chain model	
Stretching single molecular DNA by temperature gradient: a white noise functional approach	0570
Wormlikechain	
Elastic properties of a biopolymer	0165
WWF Philippines	
Socio-economic conditions and perceptions on the conservation of Tubbataha Reefs and vicinity: a households survey in Cagayancillo, Palawan	0320
X-defended	
Secure domination in a network: a protection strategy	0420
X-ray	
Radiation processing: a versatile technology for industry	0378
X-ray diffraction	
The effect of deposition time on textured magnesium diboride thick films fabricated by electrophoretic deposition	0289
Synthesis and characterization of $A1^{+3}$ doped $R_3Fe_{5-x}A1_xO_{12}$ (R=Dy and Y) iron garnets	0574
X-ray diffraction (XRD)	
Thin film formation of gallium nitride using plasma-sputter deposition technique	0581
Xanthomonas oryzae	
The application of molecular marker-assisted selection in rice breeding	0006
Yeast	

Sweet sorghum jaggery as alternative media for the production of commercial yeast	0117
Yield	
Region I adopts sweet sorghum as regional strategic commodity	0100
High yielding sweet potato variety for Mindanao	0128
Yttrium	
Synthesis and characterization of $A1^{+3}$ doped $R_3Fe_{5-x}A1_xO_{12}$ (R=Dy and Y) iron garnets	0574
Z9	
On the number of distinct self-dual codes over Z <sub>9</sub>	0427
Zea mays L	
Determination of weight percentage moldy corn kernels from bulk samples using flatbed scanner	0028
Zeolite	
Characteristics of Pangasinan zeolite as a molecular sieve for bioethanol	0284
Zeolites	
Effect of pretreatment on the structure and catalytic properties of rice hull-derived zeolites	0040
Zetzellia	
Some Philippine raphignathoidea (acari). IV. the genera <i>Ledermuelleriopsis</i> willmannn and <i>Zetzellia</i> oudemans (stigmaeidae)	0090
Zinc	
Metal absorption capacities of $\kappa$ -carrageenan blends	0263
Nutrition problems of the urban family	0492
Zinc fertilization	
Effects of zinc and boron fertilization on the alleviation of poor crop growth in heavily limed two acidic soils	0043
Zinc oxide	
Surface modified zinc oxide: a potential smoke sensor at ambient condition	0572
Zinc-deficiency	
Nutrition problems of the urban family	0492
Zingiber officinale	
Essential oil content and antibacterial activity of some Philippine plants	0251
Essential oil content and chemical composition of Philippine Zingiber officinale Rosc.	0253
Zirconia	
Structure and mechanical property of MgO-ZrO2 ceramic doped with CeO2	0308
Zone of inhibition	
Simple and rapid screening of antimicrobials in feed samples	0225

Zoology

An annotated checklist of the dragonflies of Cebu Island, the Philippines with notes on conservation	3 0607
Antigonadotropic effects of precocene II: allaticidal action in females of Nilaparvata lugens (Stal)	0608
A checklist and host index of Philippine mites (acari) associated with arthropods	0609
Zooplankton diversity	
Zooplankton diversity in Philippine Lakes	0236

## LIST OF PUBLICATIONS ABSTRACTED

Acta Manilana Advance Polymers for the 21st Century: proceedings of the DOST-JSPS workshop on materials and polymer chemistry Agriculture magazine Animal Husbandry & Agricultural Journal Asian Journal of Biodiversity **Canopy International** Challenges of Nuclear Technology for the 21st Century Conservation and ecological management of Philippine Lakes in relation to fisheries and aquaculture The Filipino Family Physician The Journal of the Philippine Medical Association Lagundi (Vitex negundo L.) monograph Matimyas Matematika: official journal of the mathematical society of the Philippines MSU Research Journal NAGA, WorldFish Center Quarterly NRCP Research Journal The PCARRD Monitor Philippine Engineering Journal The Philippine Entomologist Philippine Health Systems Research: a scientific publication of DOH-funded researches 2000-2001 Philippine Journal of Coconut Studies Philippine Journal of Nursing Philippine Journal of Science Philippine Journal on Innovation & Entrepreneurship Philippine Nuclear Journal Philippine Nuclear Journal: a publication of the Philippine Nuclear Institute The Philippine Scientist Philippine Scientist: a scholarly journal for natural and physical sciences and mathematics Philippine Technology Journal: a quarterly publication for applied researches PhilMech Journal: post harvest engineering Proceedings of the 4th annual research awards 2011 (ARAW 2011), March 25, 2011, Bulwagang Balagtas, Polytechnic University of the Philippines, Manila Science Diliman Science Diliman, A Journal of Pure and Applied Sciences Science Diliman: a journal of pure and applied sciences

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