

PHILIPPINE SCIENCE AND TECHNOLOGY ABSTRACTS

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ABOUT THE COVER

The cover is inspired by a honeycomb structure, which reflects the content of PSTA. Apart from the common knowledge that a honeycomb represents bees' house, this structure is also referred to other scientific and technological studies such as in Archaeology, Architecture, Computer Science, Genetics, Geology, Information and Communications Technology, Mathematics, and Physics. Similarly, the PSTA encompasses a variety of S&T disciplines and is consolidated into one sourcebook.

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PHILIPPINE SCIENCE AND TECHNOLOGY ABSTRACTS

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**PHILIPPINE
SCIENCE AND TECHNOLOGY
ABSTRACTS**

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Adaptability of Korean Cultivars and its Potential as Genetic Donor for Rice Breeding in the Philippines

Manigbas, Norvie L. , Madrid, Luvina B. , Badajos, April T.

Korean rice (*tong-il* type) cultivars are known for excellent grain quality and high yield. However, their full potential can only be exploited if properly evaluated under Philippine climatic conditions. Selected Korean and Philippine rice cultivars were tested at PhilRice, Nueva Ecija; San Luis, Aurora; Balilihan, Bohol; Carmen, Bohol; Quezon; Isabela; and Tabuk-Kalinga from 2011 WS - 2012 WS. Further testing was done in 2013-2017 dry and wet seasons. Significant ($p < 0.05$) yield variation was recorded in all locations and partitioning of sum of squares of different components revealed that 50.9% of variability was due to environment, 17.6% due to genotype and 31.5% due to Genotype and Environment Interaction. PhilRice, Nueva Ecija in 2012 OS was the highest-yielding environment and Milyang 23 was the most stable and high-yielding cultivar. Widely adapted cultivars include Dasanbyeo, Gayabyeo and Hyangmibyeo. Location-specific cultivars were also identified. Jinnibyeo was adapted in Quezon, Isabela; PSB Re 82 (local check), Hangangchal 1, and IR79042 in PhilRice Nueva Ecija; NSIC Re 220. in San Luis, Aurora; and Saegyeminmi in Tabuk, Kalinga. In PhilRice Nueva Ecija, more cultivars were tested and Taebaegbyeo had the highest yield. In general, low yield ($0.7-5.7 \text{ t ha}^{-1}$) was observed in early-maturing *japonica* cultivars which were mostly susceptible to pests and diseases. Korean cultivars still had high grain quality traits even when grown under tropical conditions. Due to stability of grain yield and quality, these cultivars are being used as donor parents for breeding new rice varieties in the Philippines. **(Author's abstract)**

Keywords: *Adaptability, Breeding, Germplasm, Grain yield, Korean cultivars, Rice, Agriculture*

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Addressing the Food Safety Gaps and Challenges of Consumer Health and Agricultural Export in Pakistan

Jin, Shaosheng , Nazar, Mohammad Sohail , Zhang, Xin , Shamsi, Imran Haider

Globally, food safety has prime importance for the public health and well being of consumers. In Pakistan, high pesticide residues, presence of aflatoxins, heavy metals, and microbial contamination of food are pressing issues of food safety. The current food safety administration in Pakistan lacks national level legislations, and is unorganized with its weak coordination among the controlling agencies and haphazard monitoring and inspection systems. These flaws are undermining the international trade and affecting the health of domestic as well as global consumers. In view of these, this research was undertaken to assess the various components of the current system for food safety administration, identify the shortcomings and implications of the existing food safety administration systems, and develop recommendations for its improvement. In this regard, Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of the food safety administration system of Pakistan has been conducted. Important recommendations have been made to improve the food safety system and protect the public health of the consumers. Enacting new national-level legislations, establishing a central control agency at national level, developing a rapid alert system, and timely intimation of food safety incidents, could be the effective remedies to the problems in the food safety administration system of Pakistan. **(Author's abstract)**

Keywords: *Contamination, Food hazards, Food legislation, SWOT analysis, Pakistan, Agriculture*

The Philippine Journal of Crop Science, Volume No. 44 Issue No. 2, 58-70
2019 August,

Agronomic and Yield Performance of Sweet Sorghum under Different Fertilizer Schemes

Beltran, Ayn Kristina M. , Samson, Emmanuel G. , Angeles, Domingo E. , Cabahug, Raisa Aone M. , Rivera, Haya Faye R.

The objective of the study is to assess the agronomic and yield characters of sweet sorghum under three different fertilizer treatments such as inorganic, specifically Complete and Urea (120-60-60 of N-P₂O₅-K₂O kg /ha), Vermicompost (1% N), and organic foliar, "Masinag-, (1% , 2% P, and 2% K₂O) in the provinces of Negros Occidental (Sagay City and La Carlota City) and Doilo (Barotac Viejo) for seed and ratoon crop. Among the fertilizer treatments, inorganic fertilizer proved to be the most effective since it gave higher agronomic, sugar, and yield (stripped stalk, juice and grain) characters across locations. Vermicompost can be an alternative nutrient input because it can enhance the growth and productivity of sweet sorghum specifically in plant height, stalk diameter, sugar content and grain yield. The most suitable location for sweet sorghum production is in LGRTS, La Carlota City, Negros Occidental due to abundant soil nutrients in the area (2.38% OM, 31 ppm P, 192 ppm K) which results to a higher agronomic and yield performance compared to Sagay City and Barotac Viejo. Productivity potential of sweet sorghum can be achieved with proper fertilizer application under suitable environment. **(Author's abstract)**

Keywords: *Fertilizer, Foliar, Organic, Sweet sorghum, Vermicompost, Yield, Agriculture*

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Agronomic response, nutrient uptake, and profitability of PSB Rc18 lowland rice under organic production systems

Gaurana, Minerva L.

Despite its popularity, organic farming is supported by relatively limited scientific data as compared to conventional farming. Our study was conducted to evaluate the changes in soil characteristics, growth, grain yield, nutrient uptake, and profitability of lowland rice PSB Rc18 grown in organic production systems. The experiment was laid out in RCBD with four replications and three treatments. The application of organic materials favorably affected the soil through the increase in microbial population and N mineralization. Rice grown under T1 exhibited vigorous growth, high yield (5.6 ton ha⁻¹), but late maturing. On the other hand, rice grown under T2 had earliest heading and maturation. Though rice grown in T2 were less vigorous, it resulted in acceptable grain yield (4.8 ton ha⁻¹) and comparable to those grown under T1 and T3 (synthetic fertilizer treatment). Nutrient uptake is similar for T1 and T3, while lowest in T2 which received less inputs. Organic production systems (T1 and T2) gain lesser profit/benefit if the price of ordinary palay is followed but incurs more profit/benefit if sold at premium price. Both T1 and T2 are profitable but T2 incurs less production cost and requires less input than T1, hence, T2 might further be optimized in order to gain higher grain yield. Ultimately, adoption of organic production practices in rice might be stimulated with the establishment of organic certification standards and (fixed) price premium for organic rice.

Keywords: *organic production, palay, profitability, soil microbial population, yield, PSB Rc 18 lowland rice, Agriculture*

0005

Agronomic response of four Philippine soybean cultivars to temporary flooding at two growth stages
Magdua, Liezly L.

Soil waterlogging is one of the major environmental stress factors that has a devastating effect on crop growth. This study was conducted to evaluate the response of popular Philippine soybean cultivars to waterlogging stress during early season (30 days after planting, DAP) and late season (beginning bloom, R1 stage) flooding. Response of cultivars to the timing of the stress at 14 d waterlogged duration was significant for seed yield and seed yield components. Based on seed yield damage index, PSB Sy1 was the most tolerant genotype followed by the landrace Manchuria; while PSB Sy6 and PSB Sy3 were most susceptible to waterlogging. The effect on soybean seed yield of the two waterlogging stress timings was statistically similar. The number of pods per plant, high percentage of seed-filled pods and the weight of seeds (per plant) were crucial seed yield components. Flooding stress caused decreases in root length and shoot dry matter partitioning in susceptible genotypes, whereas the tolerant PSB Sy1 (across waterlogging treatments) increased its root length, and leaf and stem-partitioned dry matter. It appears that the flooding tolerance mechanisms of soybean result in the differences in seed yield components.

Keywords: *soybean, cultivar, waterlogging stress, soil waterlogging, yield components, temporary flooding, Agriculture*

0006

Alternatives Substrates for the Production of *Pleurotus ostreatus* (Oyster Mushroom)
Portillo, Elizabeth Angeli, Benigno, Leonila Rose, Buenaobra, Ma. Sophia, Mediodia, Catherine Joy

This study aims to use agricultural wastes rice stalk, bran and husk as alternative substrates for *Pleurotus ostreatus*. The study was done at Western Visayas Integrated Agricultural Research Center, in ratios of 50:50 and 100:0, wastes to sawdust respectively. After harvest, the masses were weighed, the caps counted, and the biological efficiency was measured. Rice stalk treatments had the highest biological efficiency while rice bran and hull treatments did not produce any caps for the first flush. The dry mass post hoc results showed significant difference amongst all substrates, proving that rice stalk treatments have the highest biological efficiency and are most compatible with *P. ostreatus*. **(Author's abstract)**

Keywords: *Pleurotus ostreatus, Oyster Mushroom, Agricultural waste rice stalk, Agriculture*

Analysis of biogas production from cow, chicken and swine manure

Rollo, Edward Peter F.

Biogas is a valuable renewable energy carrier. It can be exploited directly as a fuel for internal combustion engines. Methane (CH₄) and carbon dioxide (CO₂) are the main constituents, but biogas also contains significant quantities of undesirable contaminants such as hydrogen sulfide (H₂S). The existence and quantities of these contaminants depend on the biogas source. Their presence constitutes a major problem because of corrosion, erosion, fouling, and can generate harmful environmental emissions. The main objective of the present experimental investigation was to evaluate the biogas produced from different animal manure (chicken, cow, and swine) at same technical settings on the anaerobic digestion process. As a possible means to improve the biogas production, as well as reduce their pollution potential, the idea of using the iron sponge (steel wool) for the removal of hydrogen sulfide and water scrubbing for the removal of carbon dioxide, while operating the reactor at maximum retention period has been applied. Purification of the biogas produced was done using H₂S adsorption and CO₂ absorption; thus, improving its use as fuel for power generation. The results showed that among the (3) three manure studied, swine manure produces the highest total production of biogas with the rate at 1.30561 ft³. In the hydrogen sulfide removal, chicken manure yielded the highest impurities that range from 102-132 ppm. After purification, the concentration became 1 ppm. Thus, the hydrogen sulfide purification is effective. The carbon dioxide concentration in this study found out that the chicken manure produces more CO₂ at 9.99% volume. After the purification process, the reading ranges from 0.14 % to 0.08 % volume. In this study, chicken manure contained more impurities than swine and cow manure.

Keywords: *biogas production, cow manure, chicken manure, swine manure, methane, carbon dioxide, hydrogen sulfide, contaminants, biogas source, anaerobic digestion process, purification of biogas, Agriculture*

Mindanao Journal of Science and Technology, Volume No. 15 Issue No. 1,
2017,
(Filipiniana Analytics)

Applicability of MOET Kit and MOET App to Rainfed Rice Production

Capistrano, Ailon Oliver V. , Hayashi, Keiichi

This paper evaluated the applicability of the MOET kit and MOET App in rainfed as compared to irrigated rice conditions. Originally, the MOET kit was designed for irrigated rice areas as most nutrients are plant-available in flooded conditions. This made limiting nutrients easily observable from the crop stand in a MOET setup. The availability of nutrients is due to an almost neutral soil pH range of 5.5 to 6.5 caused by flooding. However, nitrogen (N) under flooded conditions consequently undergoes stepwise reduction of plant-available nitrates resulting in significant N-losses. The alternating soil moisture conditions from flooded to aerated in rainfed areas could therefore be favourable to the plant's overall nutrition most particularly on the agronomic efficiency of applied N (AEN). Hence, the MOET kit and MOET App's applicability to rainfed conditions was tested via a 3-factorial experiment in split-split plot design. The replicated experiment was conducted at PhilRice CES in 201705 where rice ecosystem (irrigated and rainfed condition) was the main plot while the subplot and sub-subplot were N-fertilizer levels and rainfed rice varieties, NSIC Rc346 and Rc348. Fertilizer management was implemented by fully applying the required P, K, S and Zn rates generated by the MOET App while N-levels were varied at zero N, half N and full N rates to analyze AEN. Results showed no significant differences in growth and grain yield performance between irrigated and rainfed conditions in both varieties. However, the actual AEN of both varieties were lower under rainfed condition contrary to earlier hypothesis but, AEN of Rc346 was better than Rc348 across ecosystems. Overall, though actual AEN values under rainfed were lower than irrigated, the statistically

comparable growth and grain yield of the varieties in both rainfed and irrigated conditions showed applicability of MOET kit and MOET App-generated recommendations to favourable rainfed rice areas. (Author's abstract)

Keywords: *Agronomic efficiency of N (AEN), Applicability, MOET kit, MOET App, Rainfed rice, Agriculture*

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0009

Assessment of Genetic Diversity of Philippine Corn (*Zea mays* L.) Germplasm Set using Nonparametric Morphological Characteristics

Bon, Sancho G. , Huelgas, Visitacion C. , Salazar, Artemio M.

Three-hundred nineteen traditional and farmer's corn populations were characterized for 39 non-parametric traits to genetic diversity of Philippines corn germplasm collection set based on accession of assess. Analyses revealed intermediate to high H' values for most of the traits observed ranging from 0.40 to 0.98 in 31 of 39 traits of stem, leaf, ear, tassel, cob and kernel. Variation was expressed in terms of multiple morphotypes of traits and their relative frequencies. Cluster analysis based on similarity confirmed the high levels of genetic diversity with substantially high dissimilarity coefficient. Clustering was achieved at a low similarity coefficient of 0.39 where 10 groups can be identified and with 10 generally outlier accessions. Majority (70%) of the accessions generally fall within the first two large groups, Cluster 1 and Cluster 2. The closest two pairs of accessions were tied at maximum similarity of 0.82 and 0.85. Clustering was not found associated with the origin or provenances. However, pattern grouping was clear between old collections (collections mostly from 1980's to 2000s) and recent collections (collections from 2015-2016). Most of the recent collections were grouped at higher degree of similarity including the two closest pairs identified while old collections were grouped at lower degree of similarity. While the collection set was found generally diverse, results however showed that recently collected Philippine corn germplasm have reduced variability than the collections acquired about 20 to 30 yr ago. Results showed that the corn germplasm set conserved were still highly diverse despite rapid displacement, varietal homogenization and modernization of the corn agricultural landscape in the country. (Author's abstract)

Keywords: *Philippine corn, Corn germplasm diversity, Cluster analysis, Non-parametric, Agriculture*

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0010

Characteristics of Selected Hybrids of Abaca (*Musa textilis* Nee) with Resistance to Bunchy Top

Parac, Elizabeth P. , Lalusin, Antonio G. , Pangga, Ireneo B. , Sta. Cruz, Filomena C.

Two abaca hybrids namely, Hybrid 2 and Hybrid 7, which were derived from a cross between the resistant wild banana (*Musa balbisiana*) var. Pacol and the susceptible abaca var. Abuab possessing the high fiber quality trait, have been previously selected with promising resistance to bunchy top disease. In this study, the responses of these hybrids to virus inoculation by the aphid (*Pentalonia nigronervosa*) under greenhouse condition and to natural infection in the field were characterized. Under greenhouse condition, Hybrid 7 did not show the bunchy top disease symptoms of dark green streaks on veins and midribs, marginal leaf chlorosis, narrow and stiff leaves or upright and crowding of leaves at the apex of the plant, while Hybrid 2 expressed the disease in only 1 of 15

(7%) plants tested over the 6-mo observation period. The virus was not detectable by enzyme-linked immunosorbent assay (ELISA) using polyclonal antibody against *Banana bunchy top virus* (BBTV). In all asymptomatic Hybrid 2, Hybrid 7 and 'Pacol'. Plants were confirmed negative for BBTV when tested by polymerase chain reaction (PCR) using the primer pair BBT1 and BBT2 that amplifies the 349-bp fragment of viral DNA-R component. The response was observed under condition of high disease pressure wherein the susceptible 'Inosa' and 'Abuab' developed severe disease characterized by high disease incidence, high amount of disease (measured by the Area Under Disease Progress Curve), and severe symptoms. The results observed under greenhouse condition were consistent with the response to natural infection involving plants that had been grown for 5 yr (2012-2017) in the field located at the Caraga State University, Ampayon, Butuan City, Philippines. Disease index was 4% for Hybrid 2 and 0% for Hybrid 7, indicating a resistant response to bunchy top. Knowledge on the resistance characteristics would be useful information for proper field deployment of these hybrids, and for breeding varieties with resistance to bunchy top. **(Author's abstract)**

Keywords: *Abaca hybrids, Banana bunchy top virus, Bunchy top resistance, Musa textilis Nee, Agriculture*

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2020 March,
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Fil (S) S19 P53 103/1 2020

0011

Characterization of the Physical Properties of *Bacillus thuringiensis* Corn husk Fibers through Alkalization

Hernando, Krizzian, Abayon, Mark Dondy, Sitjar, Jio Vinz, Aguirre, Marc Jerome, Catolico, Joan

Bacillus thuringiensis (Bt) corn husk fibers were characterized for possible usage in textile manufacture. The fiber yield, diameter and length were determined and compared to that of native sweet corn husk fibers. Bt corn husks were subjected to alkalization for 60 minutes at 5 g/L and 10 g/L NaOH concentrations. Fibers subjected to 5 g/L and 10 g/L NaOH concentration treatment had a fiber yield of 14.69% and 16.743 respectively. The fiber diameter and the fiber length was greater in the 5 g/L (817.7 μ m and 11.7 cm) than in the 10 g/L (723.7 μ m and 5.3 cm) NaOH concentration treatment. Fiber yield was measured using a standard analytical balance. Measurement showed no significant difference between the two corn species. Diameter of fibers was also measured using the Laser Diffraction method and also no significant difference can be observed. The fiber length, measured using a Vernier Caliper had a significant difference. Bt corn husk fibers do not have an observable advantage over native sweet corn. **(Author's abstract)**

Keywords: *Bacillus thuringiensis, Corn husk Fibers, Alkalization, Agriculture*

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2018 May,
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Fil (S) Q76 P45 1/1 2018

0012

Cooling Efficiency and Effectiveness of Single-Crate Evaporative Cooler for Selected Fresh Produce

Lualhati, Ryan Anthony O., Del Carmen, Dormita R.

High temperature and low relative humidity (RH) promotes weight loss in fresh produce resulting in wilting, shrivelling, and browning. Refrigeration is the best way to prevent this but small farmers cannot afford it. An alternative is evaporative cooling. However, most evaporative coolers were not designed to be portable. This study

used a simple evaporative cooler (EC) crate for packaging and transport of selected fresh fruits and vegetables from farm to market. The cooling efficiency of the EC using plastic crate with dimensions of 54 x 36 x 30 cm wrapped with duck cloth was 70-74%. The EC was effective in extending the shelf life of lettuce rambutan, and bitter gourd up to 2 d. Shelf life of eggplant was extended up to 6 d. Weight loss was reduced by 66-86% for lettuce, 80% for rambutan, 68-73% for bitter gourd, and 87-93% for eggplant. Effect of weight loss on indices of quality deterioration (wilting, shrivelling, and browning) was established through regression and revealed shriveling of eggplant have high while wilting of lettuce have low sensitivity to weight loss. Increase in the indices of quality deterioration results to 1.50 to 1.75 decline in VQR. The critical weight loss at limit of marketability (VQR=3) for lettuce, rambutan, bitter gourd, and eggplant was 19.1, 6.2, 7.4, and 7.0%, respectively, based from the derived exponential decay of VQR with respect to weight loss. **(Author's abstract)**

Keywords: *Evaporative cooling, Cooling efficiency, Shelf life, Fresh fruits and vegetables, Agriculture*

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0013

Detection of fungus causing scab disease of citrus in Punjab, Pakistan

Munir, Neelma,

Nature has blessed Pakistan with an ideal climate for growing a wide range of delicious fruits. Thus a very wide range of tropical, sub-tropical and temperate fruits are grown in the country. In Pakistan, citrus is among the main cash crops for the farmers. Citrus is primarily valued for the fruit, which is either eaten alone as fresh fruit, processed into juice, or added to dishes and beverages. Various bacterial, fungal, viral and viral-like diseases attack citrus crop in Asia during the past couple of years. Among the fungal diseases of citrus, scab is very common. Citrus scab produces external blemishes on citrus fruit, reducing acceptability of the fruit for the fresh market. The disease is widespread in many humid, citrus-cultivating areas around the world. Different fungal species affect the citrus plants in different regions. Because these species cannot be reliably distinguished by morphological or cultural characteristics, host range and molecular methods must be used to identify different isolates. Presently, the plant disease detection techniques available are enzyme-linked immunosorbent assay (ELISA) and polymerase chain reaction (PCR). PCR is a more advance technique than ELISA. The purpose of the present work focus on the detection of scab causing fungus infecting citrus cultivars of Punjab, Pakistan. Out of 46 samples 13 were found positive for scab. On the basis of band size it can be suggested that the isolated fungus is *Elsinoe australis*.

Keywords: *citrus, detection, disease, fungus, scab, Elsinoe australis, Agriculture*

Philippine Journal of Crop Science, Volume No. 45 Issue No. 1,
2020,
(Filipiniana Analytics)

Development of a smartphone application for real-time nitrogen topdressing in rice using digital leaf image analysis

Capistrano, Ailon Oliver V.

Rice farmers seldom have proper basis for real-time Nitrogen (N) management hence, a diagnostic-recommendatory tool would be a useful and practical technology. Chlorophyll meters are commercially-available but are too expensive and normally functions only for diagnosis. PhilRice, in the past, developed the leaf color chart (LCC), a low-cost N- diagnostic-recommendation tool for rice but farmers' adoption was not too significant. This paper aimed to develop and evaluate an android-based smartphone application for real-time N fertilizer management by upgrading the technology concept of the LCC into a digital platform. Initially, a digital leaf image conversion process for dark green color index (DGCI) was developed, coded and installed in a smartphone. A variable N-rate experiment using 3 varieties in DS2017 was then established as source of leaf images with varying DGCI values and analyzed its correlation with SPAD readings. A DGCI-SPAD model was subsequently established in WS2017 to match DGCI values with topdressing N rates (kg N ha^{-1}). The PhilRice LCC App prototype was then created in DS018 that captures and convert leaf images into DGCI and recommended N rates. In WS2018 the LCC App prototype was field-tested verifying consistency of DGCI-SPAD correlations and evaluated model fitness via nRMSE. Comparative field trials against other tools were done in 2019 using NSIC Rc216 and Rc176H grown under 0N (Control), Recommended Rate (RR), Original LCC, SPAD and LCC App at 4 replications in PhilRice CES Block VI, Muñoz, Nueva Ecija. The installed image conversion tested in DS2017 had good DGCI-SPAD correlations ($R^2=0.5757$). The DGCI-SPAD model established was exponential ($y=0.581e^{0.0164x}$) and made matching of N rates with DGCI possible. The PhilRice LCC App was created using JAVA for Android following the software development life cycle (SDLC) process. In WS2018, good DGCI-SPAD correlations ($R^2=0.5686$) were proven consistent despite treatment variations with a high model fitness (nRMSE=7.14%). While DS2017 DGCI-SPAD correlations' model fitness only showed 29.93% nRMSE indicating seasonal applicability of the model. Results of 2019 field trials using NSIC Rc216 showed comparable high yields between LCC App, RR and SPAD in both seasons. While NSIC Rc176H in WS2019 also showed comparable yields between LCC App and RR. Overall, both DS2017 and WS2018 results show that DGCI and SPAD were truly correlated but observed higher model fitness in WS2018 than in DS2017 which prompted a calibrated DGCI-SPAD model for DS. Although LCC App can deliver high yields comparable with SPAD and RR, agronomic efficiency still needed improvement.

Keywords: *dark green color index (DGCI), leaf color changes (LCC), PhilRice LCC App, SPAD, DGCI-SPAD model, technology, plant app, Agriculture*

Philippine Journal of Crop Science, Volume No. 45 Issue No. 2,
2020,
(Filipiniana Analytics)

Development of Crop-Based Rainfall Index-Setting and Alternative Index Breach Assessment Methods for WIBI-LR

Capistrano, Ailon Oliver V. , Aungon, Juvy Jane E. , Hernandez, Jose Emmanuel G. , Quilang, Eduardo Jimmy P.

This paper presents an alternative but crop science-based approaches to index-setting and index breach assessments for a weather index-based insurance for low rainfall (WIBI-LR) for a rainfed rice crop. At present, indices for WIBI-LR are established via climate risk analysis wherein large data sets between crop production reports and historical weather are cross-analysed. However, in the absence or lack of data sets or low reliability of data sets, derived indices tend to be poorly applicable, causing wrong index breach assessments and payouts which are unfair to the insurance client or insurance provider or to both parties involved. Hence, the scale-up WIBI project in Mindanao focused on technical development of the WIBI-LR as a product and investigated the

rice crop's daily water requirement via an evapo-transpiration experiment. Grain yield reductions were determined per crop stage due to prolonged periods of unsatisfied crop water requirement (CWR). Three rice varieties were used for the evapotranspiration experiment namely: NSIC Rc238, Rc226 and PSB Rc82. Results of the experiment showed similar trends of water use across varieties and crop stages with peaks of transpired water averaging at 10 mm d⁻¹ and occurring between 60-80 d after transplanting (DAT). While grain yield reductions in Rc82 were quantified under 10-d drought impositions at early- and late-vegetative, early- and late-reproductive and early-maturity phases, it was found that the reproductive phase to be most sensitive to drought stress. Results from the two experiments were utilized to craft an alternative breach assessment procedure and client payout computations. Comparisons of payouts were carried out for the WS2015 insurance cycle in Davao and Bukidnon during the WIBI project in Mindanao and loss ratios between the two methods of payout computations were calculated. Based on results, the alternative approach was more business-promising for it had lower loss ratios and with breach assessments and client payouts more appropriate. **(Author's abstract)**

Keywords: *Crop water requirement, Evapotranspiration, Rainfall index, Index breaches, Agriculture*

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0016

Development of rice yield model using C-Band Sentinel-1A data *Relativo, Patrick Lemuel P.*

Rice yield models were generated using C-band synthetic aperture radar (SAR) data from SENTINEL 1-A mission. Time-series vertical transmission-horizontal reception (VH) and vertical transmission-vertical reception (VV) backscatter data were collected from November 2015 to January 2017 in Laguna, Philippines to generate and evaluate rice yield models for dry and wet seasons. Different parameters of the time-series VH and VV backscatter were considered in the development of the models. These were single-day VH and VV backscatter, VH/VV ratio and slope of the time-series curve. During dry season, rice yields were significantly correlated with VV backscatter at 24 days after transplanting (DAT), VH/VV ratio at 24 DAT, and upward slope of VH/VV ratio curve. During wet season, rice yields were significantly correlated with VV backscatter at 60 DAT, VH/VV ratio at 60 DAT, and upward slope of VH/VV ratio curve. Based on R² and RMSE values, the equation $Y = -3.673 - 1.140 * VH/VV$ data provided the best estimate of rice yield at 24 DAT during dry season; while $Y = 1.793 - 0.495 * VH/VV$ data at 60 DAT during wet season. The study has shown the potential of VH/VV ration in estimation of rice yield at varying phenological stages during dry and wet seasons.

Keywords: *c-band, remote sensing, rice yield model, SAR, Sentinel 1A, Agriculture*

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2020,
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0017

Development of Sensitive and Reliable Detection of Banana Bunchy Top Virus in Abaca *(Musa textilis Nee) by Polymerase Chain Reaction* *Piamonte, Robelyn T. , Sta Cruz, Filomena C.*

In the current abaca rehabilitation and virus resistance breeding programs, it is crucial that sensitive and reliable diagnostics is established for virus indexing of abaca planting materials and for virus resistance screening. This

study was conducted to develop a sensitive and reliable detection of Banana bunchy top virus (BBTV) by polymerase chain reaction (PCR) in abaca plant. The conditions for virus detection by PCR were optimized in template DNA extracted by Dellaporta, Sarkosyl and CTAB methods and in varying amounts (undiluted, 1000, 100, 10, 1, 0.1, 0.01 and 0.001 ng) using different primers. Detection of BBTV was most sensitive using template DNA extracted by Dellaporta compared with Sarkosyl and CTAB methods. The detectable at various concentrations up to 0.001 ng. Dellaporta extracted DNA but can be efficiently (100%) detected from 0.1 to 100 ng. The virus was also detectable at 0.001 ng but efficiency was lower with Sarkosyl (0.1 to 10 ng) and CTAB (1 to 100 ng) extracted DNA. The presence of inhibitors prevented the amplification of BBTV in the highly concentrated (undiluted and 1000 ng) Sarkosyl and CTAB but not Dellaporta extracted DNA. Dilution of the template DNA increased the sensitivity of detection. The Musa sequence was amplified in more concentrated DNA (undiluted and 1000 ng) extracted by Dellaporta but not Sarkosyl and CTAB methods, suggesting that Dellaporta extracted contained lesser amount of inhibitors. Detection of BBTV was most consistent using the BBT1/BBT2 primer pair which amplifies the DNA-R component (replicase) of the viral genome. Amplification of an internal control DNA using the Musa tagged microsatellite primers AGMI025 and AGMI026 confirmed the reliability of BBTV detection by PCR. **(Author's abstract)**

Keywords: *Banana bunchy top virus, Abaca bunchy top, Polymerase chain reaction, Agriculture*

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0018

Disease Incidence, Growth, and Physiological Characterization of Rice Cultivars with Different Susceptibility to Bakanae Disease

Kim, Sang-Yeol , Park, Dong-Soo , Lee, In-Jung , Park, Yeon-Gyeong , Seo, Jong-Ho , Bae, Hyun-Kyung , Hwang, Chung-Dong , Ko, Jong-Min

Bakanae disease is a serious problem in many rice-producing countries because it causes significant yield loss. Disease incidence, seedling growth, and physiological traits, such as leaf chlorophyll content, endogenous gibberellin (GA), and abscisic acid (ABA) production, were investigated in two moderately tolerant cultivars (Milyang 313 and Saenuri) and one susceptible cultivar (Daebo) after seeds were inoculated with bakanae disease. We evaluated their susceptibility to the disease during two seeding times (April 30 and May 10, 2016) in a nursery bed. The results showed that, 30 days after seeding, the degree of bakanae disease incidence, seedling emergence, seedling elongation, dry weight per plant, leaf chlorophyll content, and endogenous GA production corresponded to the degree of varietal tolerance. Bakanae disease incidence was lower in the tolerant cultivars, Milyang 313 and Saenuri, thus, seedling emergence rate and leaf chlorophyll content were higher than in the susceptible cultivar, Daebo. Meanwhile, seedling elongation and dry weight per plant were greater in the susceptible cultivar 30 days after seeding. Content of endogenous GA (GA₃ > GA₁ > GA₅) markedly increased in all three cultivars and at the later seeding time. GA levels were markedly affected by degree of susceptibility, disease incidence, and seedling elongation. In contrast, GA₂₀ did not show any consistent trend. The endogenous ABA level of the infected cultivars was markedly increased, compared with the control, but this hormone did not show any consistent tendency between the susceptible cultivar and the tolerant cultivars across seeding times. These results demonstrate that Milyang 313 and Saenuri are tolerant, whereas Daebo is susceptible to bakanae disease, thus, these tolerant cultivars should be utilized in breeding programs to produce more bakanae disease-tolerant cultivars. **(Author's abstract)**

Keywords: *Abscisic acid, Bakanae disease, Gibberellic acid, Rice, Susceptibility, Agriculture*

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DNA Fingerprinting and Genetic Diversity Analysis of Philippine Saba and Other Cultivars of *Musa balbisiana* Colla Using Simple Sequence Repeat Markers

Doloiras-Laraiio, Arnelyn D. , Garcia, Roberta N. , Sandoval, Carlo Miguel C. , Lalusin, Antonio G. , Gueco, Lavernee S. , Huelgas, Visitacion C. , Tecson-Mendoza, Evelyn Mae

Recognizing the importance of the indigenous Philippine cultivars of *Musa balbisiana* Colla which include the popular Saba varieties, it is essential to correctly identify these cultivars for various applications. Simple sequence repeat markers were used to generate DNA fingerprints and characterize the genetic diversity among 13 Philippine *Musa balbisiana* Colla cultivars and 5 other banana cultivars. Fifty-one primer pairs (45 from *Musa* and 6 from other species) were screened for PCR amplification and polymorphism across 18 cultivars. Fourteen primers were found to be polymorphic markers. A total of 49 -alleles were generated, with a mean of 3.77 alleles per locus, ranging from 1-8 alleles. The resolving power of molecular markers measured as the Polymorphism Information Content (PIC) ranged from 0.23 to 0.80. Mean gene diversity ranged 0.08 to 0.49 indicating high diversity. The dendrogram using UPGMA-SAHN cluster analysis based on microsatellite polymorphism showed that the Saba cultivars clustered into two groups at 56% similarity level. Cluster analysis separated the cultivars of *Musa balbisiana* Colla from the other genotypes of *Musa acuminata* Colla and *M. textilis*. The 13 polymorphic SSR primers were shown to be able to identify and differentiate the 13 cultivars suitable for specific needs of the industry. **(Author's abstract)**

Keywords: *Saba, Musa balbisiana, DNA fingerprints, Diversity, SSR, Agriculture*

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Effect of Rice-Corn Mix Consumption on Growth and Nutrient Intake of Malnourished Children

Lalap, Belinda A. , Tabuac, Erica B. , Ilagan, Joan R. , Hurtada, Wilma A.

With the increasing prevalence of malnutrition due to the country's food insecurity problem specifically inaccessibility to sufficient rice, the IPB var 6, quality protein white maize (QPM) was developed as an alternative staple. This randomized controlled feeding trial aimed to assess the effect of rice-QPM corn grits mix consumption on the growth and nutrient intake of 3-5 yr.old malnourished children in Los Banos, Laguna. Forty -two malnourished children were randomly assigned to different treatment groups: 100% rice, 70:30% rice-corn and 50:50% rice-corn mixtures (RCM) and were fed for 120 d. Results revealed that there was significant improvement in the mean energy and protein intake from the baseline to endline in all groups. The highest mean energy (960.26 kcal), protein (34.92 g), lysine and tryptophan intakes were observed among children fed with 50:50% RCM. Zinc and iron intakes per day were adequate for all groups. Significant improvements in the quality of the diet of children in all groups were also observed. The mean DDS at midline and endline was within medium dietary diversity score range of which 4-5 of the food groups were eaten by the children. Along with significant increase in energy and nutrient intake was the significant increase in the weight, height and MUAC; and changes on the nutritional status indicators WAZ, HAZ, WSP and BMIAP were the same among meal types. The computed odds ratio for weight indicates that 50:50% RCM could likely improve underweight children to being normal by weight. Similarly, consumption of 70:30% RCM may also likely improve stunted children to being normal in height. Thus, the incorporation of corn to the staple could possibly contribute to the improvement of weight and height among children as compared to rice alone. **(Author's abstract)**

Keywords: *IPB var 6 Quality Protein Maize, Nutritional status, Rice-corn mix (RCM), Undernutrition, Agriculture*

Effect of Tillage Systems on Soil Properties and Yield of Wheat and Rice in Rotation
Liang, Shumin , Xie, Ruizhi , Zheng, Zhu , Rashid, Muhammad Abdul Rehman , Tangs, Yonglu , Liu, Yuee , Yang, Jinzhong , Li, Chaosu , Chen, Bing , Li, Shaokun

Effect of four tillage systems (1) winter wheat and rice rotary tillage (WRRT) (CK), (2) winter wheat and rice no-tillage system (WRNT), (3) winter wheat no-tillage and rice rotary tillage (WNRR), and lastly, (4) winter wheat and rice no-tillage in a raised bed (WRNB) on soil properties and crop yields was investigated in a field experiment in 2004-2010 in a wheat-rice crop rotation on the Chengdu Plain, China. The WRNT system significantly increased the saturated hydraulic conductivity and water infiltration relative to the WNRR and the WRRT (CK) systems. The soil cone penetration resistance was greater in certain soil layers beneath the three systems, compared to the CK system ($P < 0.05$). The three tillage systems also significantly increased soil erodibility K ($P < 0.05$) and soil organic matter (SOM) ($P < 0.05$) in certain soil layers but had no significant differences in the soil bulk density, total porosity, and specific gravity among the four tillage systems. Additionally, WNRR improved the wheat yield by 4.0% and rice yield by 8.8% relative to CK. **(Author's abstract)**

Keywords: *Conservation tillage, Crop yield, Soil degradation, Soil properties, Wheat-rice crop rotation, Agriculture*

Effect of Wet Land Preparation Period on Weed Density and Grain Yield of Transplanted Lowland Rice
Samoy-Pascual, Kristine , Bautista, Elmer G. , Valdez, Harvey V. , Gagelonia, Eden C.

Wet land preparation for rice production in the Philippines typically entails 21-30 d of several field operations that requires substantial amount of water. As irrigation water is getting scarce, there is a need to evaluate the effects of shortening the land preparation period on the grain yield and weed density of transplanted rice. We evaluated the effects of different land preparation period and manual soil leveling on the said parameters during the 2012 dry and wet season (DS and WS), and 2013 DS in Nueva Ecija, Philippines. Treatments were 1) land preparation period (7d, 14d, 21d), and 2) levelness of the soil (L1 =well-levelled and L2 =not-solevelled) based on the number of passes by a wooden plank during the final soil leveling. The shortest land preparation (7d) consistently showed the highest weed density among treatments but significant differences were only observed in 2012 OS and WS at 15 and 30 days after transplanting. The dominant weed flora were grasses such as *Cyperus rotundus* and *Panicum repens*. The L1 consistently exhibited grain yields that is higher by 3-13% compared to L2, but the difference was only significant in 2013 OS. We found no significant differences on the grain yield of rice among land preparation period but 14 d showed yields that is higher by 2-4% relative to other treatments. Our result indicates that shortening the conventional wet land preparation period (i.e. 21 d) did not affect the grain yield of rice. However we recommend 14 d as optimum period of wet land preparation due to less weed density compared with 7 d. **(Author's abstract)**

Keywords: *Grain yield, Land preparation, Rice, Soil level, Weed density, Agriculture*

Effects of dehydration on the bioactive compounds of waste onion leaves

Borines, Myra G

Waste onion leaves were found to possess flavor, aroma and bioactive components similar to that of onion bulb which are useful in various food applications making it a potential alternative spice. Although drying is known as a preservation technique for herbs such as onions, it is often accompanied with loss of volatiles and bioactive compounds. In this study, the changes in bioactive compounds of waste onion leaves in terms of total phenolic content (TPC) and total flavonoid content (TFC) as well as flavor and aroma components such as sulfur-containing compounds using various dehydration techniques (sun drying, conventional drying, freeze drying and vacuum drying) were evaluated. Effects of drying parameters such as temperature, time, vacuum pressure and blanching on preservation of bioactive compounds in waste onion leaves were also investigated. Results showed that vacuum drying is the most efficient drying technique in terms of moisture reduction and TFC preservation but not with TPC retention. Conventional drying showed favorable results on the preservation of TPC and TFC but failed to reduce the moisture of onion leaves below 15%. Heating had a positive effect on TFC of dried onion leaves except for sun drying. Sun drying showed comparable performance with freeze drying in preserving TPC, however, the color and appearance of sun-dried samples were not retained and the desired moisture was not attained. Longer drying time and increasing pressure resulted to a more favorable retention of TPC while blanching significantly reduced the TPC. A decrease in TFC was observed at increasing temperature and shorter drying time. Sulfur-containing compounds like alk(en)yl mono-, di-, and tri-sulfides onions, which contribute to the aroma of onion, were detected in all the dried samples. From these results, the type of drying method can significantly affect the bioactive components, as well as the flavor and aroma of dried onion leaves.

Keywords: *bioactives, conventional drying, flavonoids, dehydration, freeze drying, gallic acid, onion leaves, phenolics, quercetin, thiosulfates, vacuum drying, Agriculture*

Efficacy of Postharvest Treatments in Reducing Stem End Rot of 'Carabao' Mango (*Mangifera indica* L.) Fruit

Montecalvo, Melissa P. , Opina, Oscar S. , Dalisay, Teresita U. , Esguerra, Elda B.

The efficacy of postharvest hot water treatment (HWT), fungicide dips, and modified atmosphere packaging (MAP), and their combinations in reducing stem end rot (SER) incidence of 'Carabao' mango fruits was determined. Among the postharvest treatments, HWT (55°C for 10 min) effectively reduced SER incidence by 61-70%. Fungicide dips at their recommended rates (azoxystrobin at 175 ppm and tebuconazole at 156 ppm for 5 min) provided similar degree of disease control (<18%). HWT plus fungicide dip enhanced control efficacy by 80%. The disease incidence increased by 15% with prolonged storage at 13°C from 21 to 28 d after treatment (DAT). Different combinations of postharvest treatments remarkably reduced the disease up to 98% in mango fruits stored at 13°C for 21 DAT. HWT plus azoxystrobin dip and HWT plus tebuconazole dip and MAP decreased the disease incidence up to 93% in mango fruits stored at 13°C for 28 DAT. Due to the significant reduction in

disease incidence, the shelf life of the treated mango fruits was prolonged for more than 4 days. Peel color development was delayed when fruit was packed in MAP while HWT enhanced ripening. However, MAP appeared to favor SER infection. Physico-chemical attributes such as firmness, total soluble solids, titratable acidity, and pH were slightly influenced by the postharvest treatments. Findings of this research suggest that the integration of postharvest treatments will ensure effective suppression of SER and prolonged marketable period.

(Author's abstract)

Keywords: *Fungicides, Hot water treatment, Mango, Stem end rot, Agriculture*

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0025

The Energy Cost of Cambodian Lowland Rice Grown Under Different Establishment Methods

Savuth, Sem

Agricultural practices play an important role in increasing crop yields. Consequently, higher crop yield is associated with high energy use. In Cambodia, rice is grown using different establishment methods. But high amount of energy is required to grow rice until the time it is ready for consumption. This study aimed to estimate the various energy use from farm to plate of lowland rice grown under three methods, namely: direct seeded rice (DSR), transplanted rice (TPR) and System of Rice Intensification (SRI). One hundred sixty-one farmers and six rice millers were interviewed using a structure questionnaire in July 2017. Results revealed that the total energy inputs in the field production were in the following order: TPR, DSR, and SRI at 10843.65 MJ ha⁻¹, 10323.34 MJ ha⁻¹, and 7051.61 MJ ha⁻¹, respectively. The energy used to produce a kilogram of paddy rice was highest in TPR (3.45 MJ kg⁻¹) and lowest in SRI (2.08 MJ kg⁻¹). On the other hand, the total energy output of 56742.30 MJ ha⁻¹ from a grain yield of SRI was significantly higher from DSR but not with TPR. The embedded energy for machine use was not that high because the machinery lifespan considered was 10 years which was spread throughout the operational working duration. Nitrogen was the energy hotspot at 40-50% of the total energy bill in TPR and DSR but not in SRI. Optimizing N application can reduce the total energy input in the rice production. The energy hotspot of SRI was human labor which was 24% of the total energy bill. All of the measures of energy use showed that SRI was the best practice (lowest breakeven energy yield, lowest energy to produce 1 kg grain, highest energy use efficiency, energy productivity and net energy gain). The total energy use of rice in Cambodia from farm to plate was 4.30 MJ kg⁻¹ or about 0.09 Liter Diesel Oil Equivalent (LDOE) kg⁻¹ wherein 69.30% was used in production, 26.28% in post- production and 4.42% in cooking. The major contributor of the energy costs in post-production was transport. When rice was milled and transported up to 280km-distance, the energy used in post-production increased 2.05 times when compared to local consumption (5km-distance).

Keywords: *direct seeded rice, energy bill, energy hotspot, system of rice intensification, transplanted rice, rice, Agriculture*

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Extending the Storage Life of Fresh Turmeric (*Curcuma longa* L.) Rhizomes Through Light and Temperature Manipulation

Zuniega, Johnrell S. , Esguerra, Elda B.

Turmeric (*Curcuma longa* L.) is becoming an important underutilized crop because of its use as a natural food colorant and its varied pharmacological properties. It is subject to dehydration, sprouting, and chemical degradation of curcuminoids, the major antioxidant, when exposed to light and high temperature. This study was conducted to determine the storage life of fresh turmeric rhizomes at 12-14°C and at ambient condition of 27-30°C either continuously exposed to light or covered with jute sack (without light). Regardless of light exposure, storage at 12-14°C reduced weight loss hence none to very slight shriveling, prevented sprouting thus the high visual quality rating of the rhizomes for 20 wk, retarded the decline in the intensity of yellow-orange color of the flesh, and maintained the acceptability of the extract (juice) to the sensory panelists. On the other hand, turmeric stored at 27-30°C resulted in high weight loss manifested as shriveling and early onset of sprouting on the 8th week of storage. Firmness of the rhizomes however, did not change markedly during storage even when sprouting had occurred. Likewise, respiration rate and ethylene production of the rhizomes did not vary between storage temperature and light exposure. Total phenolic content and antioxidant activity did not change markedly during storage regardless of the treatment. The study showed that turmeric rhizomes can be stored for 20 wk at 12-14°C without significantly affecting the quality and antioxidant property of the rhizomes. **(Author's abstract)**

Keywords: Antioxidant activity, *Curcuma longa*, Quality, Storage, Total phenolic content, Turmeric, Agriculture

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Feasibility and Financial Viability Study of an Intensive Mustard-Mungbean-Transplanted *Aus* Rice-Transplanted *Aman* Rice Cropping System in a Non-Saline Coastal Ecosystem of Bangladesh

Islam, M. S. , Hossain, Akbar , Timsina, Jagadish , Saif, H. , Sarker, M. M. R. , Khan, A. S. M. M. R. , Hasan, M. K. , Zahan, T. , Sabagh, Ayman EL , Akdeniz, Hakki , Barutcular, Celaleddin

Even as Bangladesh has achieved remarkable progress in food production, especially rice production, there is growing concern about how to feed its increasing population in the future since natural resources such as agricultural land and water are shrinking and undergoing degradation due to climate change. With the country's limited agricultural land area, horizontal expansion for crop production is hardly possible; on the contrary, vertical expansion is possible through increase in crop yield per unit area and reduction of production losses. Such expansion is only possible in the non-saline coastal areas where overall cropping intensity is lower compared with other parts of the country. To test this hypothesis, an experiment was conducted in a non-saline coastal ecosystem of Bangladesh in 2015-2016 and 2016-2017 to evaluate the feasibility and financial viability of a four-crop-based cropping pattern, i.e., Mustard-Mungbean-T. *Aus*-T. *Aman* against the farmers' three-crop-based pattern 'Mustard-Dibbling *Aus*-T. *Aman*'. After 2 yr, it was observed that the improved cropping pattern produced 19.4 t ha⁻¹ of rice equivalent yield compared to only 10.7 t ha⁻¹ in the farmers' cropping pattern. Land use efficiency and production efficiency in the improved cropping patterns were 94.3% and 36.8 kg ha⁻¹ d⁻¹, respectively, compared to only 79.7% and 28.3 kg ha⁻¹ d⁻¹ in the farmers' cropping pattern. Gross margin in the improved cropping pattern was 1914 US\$ ha⁻¹ whereas it was 924 US\$ ha⁻¹ in the farmers' cropping pattern. The marginal benefit cost ratio of the four-crop-based cropping pattern was 2.38 over the farmers' cropping pattern. In both patterns, there was negative apparent nutrient balance for K but positive balances for N and P. Based on productivity and economic returns, the study suggests that the improved four-crop-based cropping pattern is feasible and financially viable in the non-saline coastal zone of Bangladesh. These results will also have implications for the adjacent coastal ecosystems in India. **(Author's abstract)**

Keywords: *Four-crop-based cropping system, Vertical expansion, Coastal ecosystem, Rice, Mustard, Mungbean, Agriculture*

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0028

Fertilization scheme and bunch trimming on enhancing productivity and fruit quality of *Cardaba banana Musa balbisiana* (BBB)

Fabro, Dara Maria A.,

Banana is one of the top agricultural exports of the Philippines. With the rising demand, farmers need to improve and sustain farm productivity. Cultural management practices ensuring the production of marketable yield that meets the consumers' requirement is a valuable information to improve productivity. This study sought to evaluate the effects of bunch trimming and fertilization scheme on productivity and fruit quality of Cardaba grown in Candelaria, Quezon. Bunch trimming involves two methods, removal of the male bract and the removal of the last hand consequently with the male bract. On the other hand, fertilization at recommended rate of 220-20-260 kg ha⁻¹ NPK annually was compared with that of the farmer's practice (FP). Results showed that fertilization at recommended rate with one hand trimmed produced larger (in terms of length and diameter) and high total soluble solids. Debelling had higher bunch yield due to higher finger count. Findings in this study can be used to tailor fertilization and bunch trimming to improve the quality of the bunch in accordance to preference of the market.

Keywords: *Cardaba banana, debelling, fruit quality, bunch quality, hand trimming, fertilization scheme, Musa balbisiana, Agriculture*

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0029

Fruit Thinning Enhances Yield and Quality of Local Apple Fruit (*Malus domestica* Borkhausen) var. Gaja in Pakistan

Rehman, Noor , Latift, Asif , Hashim, Malik Muhammad , Khan, Atiq Ahmad , Gillani, Syeda Mehwish , Khan, Hakeem Ullah , Ali, Muzafar

The apple tree usually has heavy fruit set but to improve the individual fruit size, apple growers reduce the number of fruits by thinning. The present study was carried out to assess yield and quality of apple fruit as influenced by fruit thinning. The experiment was carried out in a randomized complete block design (RCBD), with two factors, viz. time of thinning (factor 1) and amount of thinning (factor 2). Factor 1 included thinning after 2 wk of fruit set and 4 wk after fruit set; Factor 2 included one fruit per cluster, two fruits per cluster, three fruits per cluster, and four fruits per cluster. Each treatment was replicated three times. The indigenous apple germplasm Gaja was selected for the experiment. Fruit diameter, fruit length, fruit weight, fruit color, total soluble solids (TSS), and fruit pH were significantly improved by fruit thinning intensity while total yield, fruit drop percent, number of fruits per kg and fruit firmness were reduced by increasing thinning intensity. Leaving 2-3 fruits per cluster not only improved the fruit size (diameter and length) but also gave maximum economic return. **(Author's abstract)**

Keywords: *Apple, Economic return, Fruit thinning, Yield, Agriculture*

Fuel properties of charcoal briquettes derived from combinations of coconut (*Cocos nucifera* L.) husk and Bitanghol-sibat (*Calophyllum soulattri* Burm. f.) bark
Mendoza, Rosalie C.

This study attempted to characterize the fuel properties of briquettes made from coconut (*Cocos nucifera* L.) husk, Bitanghol-sibat (*Calophyllum soulattri* Burm. f.) bark and combination of these two materials with different blending ratios (90% coconut husk:10% bark, 80% coconut husk:20% bark and 70% coconut husk:30% bark). Properties analyzed were moisture content, volatile matter, ash content, fixed carbon, gross calorific value and elemental composition. Results showed that pure Bitanghol-sibat bark briquette has better fuel properties than coconut husk. Among the combinations analyzed, it has the lowest moisture content (1.4%) and ash content (13.52%), but has the highest fixed carbon (56.78%) and gross calorific value (5168 Kcal kg⁻¹). In terms of volatile combustible matter, coconut husk briquette has higher percentage (37.13%) compared to Bitanghol-sibat bark briquette (29.7%). Similarly, pure Bitanghol-sibat bark briquette gave the highest % C, H, and O values in the form of cellulose (76.24%) and yet showed the highest amount of sulfur (0.46%). Nevertheless, sulfur values observed among the blending ratios were all below 1%. Nitrogen was not observed among briquette combinations. Elements such as potassium, calcium, and chlorine were also noticed due to the starch binder used.

Enhanced fuel properties were observed in the combined coconut husk and Bitanghol-sibat bark briquettes. Lower ash content, higher fixed carbon and higher gross calorific values were recorded in the three blending ratios. Properties were most improved in the 70:30 combination. Lower moisture content, ash, % H and % O, higher volatile combustible matter, fixed carbon and gross calorific value were recorded for this combination. It also has low sulfur content which indicates that the polluting effect of the briquette would be minimal.

Keywords: *briquettes, Calophyllum soulattri, Cocos nucifera, coconut husk, Bitanghol-sibat, gross energy, proximate analysis, ultimate analysis, Agriculture*

Gene Expression Profiling in Rice (*Oryza sativa* L.) Cultivars with Different Levels of Seedling Vigor under Submergence Stress
Manangkil, Oliver E. , Rafael, Ayra B. , Nakamura, Chiharu

Ethanol fermentation has been considered to play an important role in supporting vigorous seedling growth under submergence in rice. Non-energy-conserving terminal oxidation in plant mitochondria has also been implicated to play a role in submergence stress response. We carried out detailed time course studies of expression patterns of genes encoding alcohol dehydrogenase 1 (ADH1), aldehyde dehydrogenase 2 (ALDH2a and ALDH2b) and alternative oxidase 1 (AOX1a and AOX1b) between rice cultivars with different levels of seedling vigor under submergence. RT-PCR analysis showed that marked induction of ADH1 and ALDH2a occurred under submergence and their transcript levels rapidly increased with time and decreased during de-submergence in both vigorous and non-vigorous cultivars. Expression of ALDH2b was suppressed under submergence in both

cultivars. Macroarray analysis gave comparable results with respect to expression profiles of these genes. Immunoblot analysis using an antibody showed an increase in the amount of ALDH2 protein under submergence and a decrease during de-submergence. Expression of AOX1a transcript was enhanced under submergence and decreased upon de-submergence in a vigorous cultivar, while AOX1b was down-regulated under submergence in a non-vigorous cultivar. Based on results, ADH1 and ADH2a are highly expressed during the submergence, thus are associated with seedling vigor under submergence stress. **(Author's abstract)**

Keywords: *Candidate genes (ADH1, ALDH2, AOX1), Expression profiling, Rice, Seedling vigor, Submergence tolerance, Agriculture*

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0032

Genetic Diversity of Select Southeast Asia Traditional Rice (*Oryza sativa* L.) Through Molecular Markers

Caguiat, Xavier Greg I. , Raneses, Mary Ann M. , Ferrer, Marilyn C. , Alfonso, Danny O. , Santiago, Jaec C. , Nombriere, Jose Marie , Castro, Jeric R. , Duldulao, Malvin D. , Vilayheuang, Koukham , Devarajan, Thiyaagu , Kamaruzaman, Rahiniza , Mulya, Karden , Lestari, Puji , Sabran, Muhamad

Rice is one of the most important food crops for human and genetic information on germplasm is a prerequisite in crop breeding programs. The study aimed to assess the genetic diversity of 100 rice germplasms from representative Southeast Asian countries: Indonesia, Malaysia, Laos and Philippines through SSR markers. Genetic diversity was determined using established 20 SSR markers. The number of alleles per locus ranged 2 to 5 at an average of 3.2 alleles. PIC values ranged from 0.17 (RM25934) to 0.71 (RM144) with an average of 0.42. The UPGMA cluster analysis showed 100 varieties which grouped in two major clusters (A and B), with 7 sub-clusters at 0.70 similarity coefficient. Philippine rice varieties grouped in clusters A-I and B-V while varieties from Indonesia and Laos are in clusters B-1 and B-11 and Malaysian rice varieties in B-111 and B-IV. Highest similarity (0.96) was observed between "Widas" (Indo20) and "Inpari HOB" (Indo21), "Sekembang" (Mal10) and MR 81 (Mal17), "Beua nam" (Laos14) and "Nam yen" (Laos15), "Wagwag raois" (Phil13) and "Katsyam tabao" (Phil16). Overall diversity showed moderate variability among the 100-rice germplasm. The SSR markers were able to show the level of genetic information at the molecular level suitable to identify, develop and acquire genetically unique germplasm that will benefit the plant breeders in terms of widening the diversity of existing local genepool. **(Author's abstract)**

Keywords: *Diversity, Germplasm, Rice, SSR, Southeast Asia, Agriculture*

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0033

Genetic Diversity of Spinach (*Spinacia oleracea* L.) Landraces from the Center of Origin, Iran

Sabaghnia, Naser , Asadi-Gharneh, Hosien Ali , Mohebodini, Mehdi , Janmohammadi, Mohsen

Eighty one Iranian spinach landraces accessions were evaluated for 13 agro-morphological traits. Data from 2 yr experiment of the native accessions were subjected to multivariate analysis using cluster analysis. The dendrogram

of cluster analysis in both years revealed eight and nine major groups, respectively. The highest variations were recorded for days to flowering, leaf area, number of lateral branches, 1000-seed weight and leaf yield traits. Twelve genotypes were identified as favorable genotypes due to their high values for most of measured traits, especially leaf yield performance. The observed genetic differences among the investigated landraces are potentially significant to breeding program for obtaining high leaf yield cultivars and it may be achievable through hybridization of the contrasting forms from distinct clusters. The study raised the possibility that selection based on the morphological traits would be advantageous for recognition of highly productive genotype(s). **(Author's abstract)**

Keywords: *Diversity analysis, Germplasm collection, Leaf yield, Spinacia oleracea L., Agriculture*

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0034

Genetic Diversity of Sugarcane (*Saccharum officinarum* L.) Varieties Using SSR Markers

Mora, Jessica Mae , Rasco, Jhun Laurence S. , Mendoza, Mariecris Rizalyn DR. , Abustan, Mary Ann M. , Vinarao, Grace B. , Lalusin, Antonio G.

Genetic diversity of 65 sugarcane varieties developed by the Sugar Regulatory Administration were assessed using 20 polymorphic *Saccharum*-based SSR markers. High genetic diversity was indicated by the resulting banding patterns from the markers ranging from 6 to 29 with a mean of 16.15 with Polymorphic Information Content (PIC) value ranging from 0.60-0.96. Cluster analysis using Jaccard's dissimilarity coefficient of 0.68 generated three clusters which means that the clusters are 68% different from each other. The largest cluster was Cluster 11 with 34 varieties, followed by Cluster I with 30 varieties, and Cluster III with only one variety (Phil 98-157-2137), suggesting that this variety is distinct based on the 20 primers used. The resulting groups can be used in sugarcane breeding to select divergent parents to maximize heterosis. The utilization of SSR markers can provide sufficient information for making reliable crossings which is useful for future breeding purposes using SRA varieties which are first priority parentals. **(Author's abstract)**

Keywords: *Cluster analysis, Genetic diversity, SSR markers, Sugarcane, Agriculture*

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0035

Growth enhancement of rice (*Oryza sativa* L.) by zinc-solubilizing bacteria isolated from vesicular-arbuscular mycorrhizal root inoculant (VAMRI)

Nepomuceno, Robert A., &n

Zinc deficiency is the most common soil micronutrient deficiency all over the world. An effort to isolate, zinc solubilizing microorganisms (ZSMs) in VAMRI, a commercial mycorrhizal inoculant, was undertaken to realize the possibility of solving soil zinc deficiency through microbial inoculation. Five bacterial isolates (*Sphingobacterium multivorum*, *Burkholderia cenocepacia*, *Bacillus xiamenensis*, *Burkholderia ambifaria*, and *Bacillus aerius*) grown in LGI medium supplemented with insoluble zinc compound (0.1%) tested positive for zinc solubilization with solubilization index ranging 3.09±0.07 to 5.21±0.07. Subsequent quantification of zinc

solubilization of select bacterial isolates through atomic absorption spectroscopy revealed a significant increase in available zinc ranging 679.64-1017.23 ppm over the uninoculated control. Sand culture experiment also showed the isolates significantly increased rice height, with isolate *B. cenocepacia* (V3) having similar performance as the positive control with available zinc. Hence, the inoculation of ZSMs shows great prospect in alleviating soil zinc deficiency in rice.

Keywords: zinc solubilizing bacteria, soil zinc deficiency, biofertilizer, growth enhancement, *Oryza sativa*, *Sphingobacterium multivorum*, *Burkholderia cenocepacia*, *Bacillus xiamenensis*, *Burkholderia ambifaria*, *Bacillus aerius*, Agriculture

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0036

***In Vitro* Root and Shoot Formation of *Rosa centifolia* using Plant Growth Regulators**
Akhtar, Guizar, Jaskani, Muhammad Jafar, Sajjad, Yasar, Akram, Ahsan, Farooq, Amjad, Rasool, Ghulam

Rosa centifolia is one of the most economically important floriculture crops that is grown and used for oil extract which has various applications in pharmaceutical industries. It is commercially propagated through cuttings, but low rooting percentage has always been a problem since rose species are difficult to root. To address this problem, a protocol was developed to meet the growing demands for *R. centifolia* through *in vitro* propagation technique. Nodal segments were used as an explant and were cultured in a MS medium supplemented with different concentrations (0.2, 0.4, 0.6 and 0.8 μ M) of Benzylaminopurine (BAP) and Kinetin (KIN), alone and in combination of both, for induction of shoots. For root induction, different concentrations (0.2, 0.4, and 0.6 μ M) of Indole Butyric Acid (IBA) and Naphthalene Acetic Acid (NAA) were used in a % strength MS medium. BAP at 0.2 μ M concentration produced the highest number of shoots (1.93) and longest shoot elongation (5.55cm) vis-a-vis other concentrations. Moreover, minimum number of days (10.2) to shoot induction was observed at 0.4 μ M of BAP in combination with 0.2 μ M of KIN. On the other hand, IBA at 0.4 μ M had the minimum number of days (10.07) to produce roots, highest number of roots (2.47), and longest root elongation (4.21cm) among other concentrations. Thus, it is concluded that BAP at 0.2 μ M and IBA at 0.4 μ M concentration are effective for shoot and root formation of *R. centifolia*, respectively. **(Author's abstract)**

Keywords: IBA, *In vitro*, Root induction, *Rosa centifolia*, Shoot induction, Agriculture

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0037

Modeling Nitrate Transport in Soils under Multiple Cropping Systems in Aurora, Isabela, Philippines
De Leon, Louie M., Ella, Victor B.

This experimental and modeling study was conducted to compare the nitrate transport behavior of conventionally-tilled (CT) and no-till (NT) soils under multiple cropping systems in the Philippines. This study also aimed to simulate the effects of soil organic carbon on nitrate transport. Undisturbed soil columns were obtained from both production systems. Miscible displacement experiments were performed to determine the dispersivity and

retardation factor. The CXTFIT model was used to optimize the values of dispersivity and retardation factor in the Convection-Dispersion Equation (COE). Results showed that the upper layer of CT soil exhibited the highest dispersivity of 14.55 cm and lowest retardation factor of 1.19 and showed the highest peak concentration of 0.69 Co and shortest peaking time of 134 s. On the other hand, the upper layer of NT soil showed a lower dispersivity of 3.05 cm and higher retardation factor of 2.92 and exhibited the lowest peak concentration of 0.39 Co and a longer peaking time of 12 min. The differences in solute transport behavior may be attributed to the relatively higher organic matter content in NT soils than in CT soils and the presence of macropores and possible compaction in CT soils. Model efficiency ranging from 81-93% indicates that the COE satisfactorily modeled the nitrate transport in these soils with a high degree of accuracy. Simulation of the effects of varying fractions of organic matter on nitrate transport for a 10-yr period showed a 19.2% decrease in peak concentration and 15.4% increase in peaking time for a projected 30% increase in organic carbon in NT soils. For CT soil, a 3% decrease in organic carbon will result to a 6.8% increase in peak concentration while the time to peak will remain unchanged. **(Author's abstract)**

Keywords: Breakthrough curves, Nitrate transport, Dispersivity, Retardation factor, Solute transport modeling, Agriculture

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0038

Modified atmosphere packaging and low temperature storage of red-fleshed dragon fruit (*Hylocereus polyrhizus* (Weber) Britton & Rose)
Castro, Angelo C.

Dragon fruit (*H. polyrhizus*) gained popularity in the Philippines because of its attractive red peel and green bracts, high nutritive value and reputation for profitability. However, it is a short-season crop and highly perishable due to moisture loss, shrivelling, decay and bract discoloration that detracts consumer appeal and limit its marketable life. This study was conducted to extend the storage and shelf life of dragon fruit through modified atmosphere packaging (MAP) in combination with storage at low temperature. Excellent quality fruit harvested at 25-30 d after flowering were sleeved in polystyrene fruit cup and individually packed in 50.8 µm thick polyethylene (PE) and polypropylene (PP) non-perforated plastic bags. Sample fruits were withdrawn every 2 wk from storage at 5°C and transferred to 20°C for shelf life evaluation. MAP-stored fruit remained in excellent condition for up to 6 weeks at 5°C without any shrivelling thus fruits were firm, and bracts remained green. The use of polystyrene fruit cups generally aided in maintaining the visual quality of the fruit by protecting the bracts from breaking during handling. Non-packed (non-MA packed) fruits on the other hand lasted for only 4 wk at 5°C with noticeable change in visual quality and the bracts already exhibiting yellowing and tip browning. Shelf life at 20°C after a 4 wk storage of MA- and non-MA packed fruits were 5 d and 2 d, respectively. Extension of storage to 6 wk shortened the shelf life of MA-packed fruit to 3 d while non-MA packed were already unmarketable. Total soluble solids, titratable acidity and total phenolic content were higher in PE-packed fruit at its limit of marketability at 20°C.

Keywords: dragon fruit, low temperature storage, modified atmosphere packaging, *Hylocereus polyrhizus*, modified fruit harvest, Agriculture

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Morphological Characterization and Karyotype Analysis of Abaca (*Musa textilis* Nee) and its Hybrids with *Musa balbisiana* Colla

Labrador, Deziree A. , Lalusin, Antonio G. , Mendoza, Mariecris Rizalyn R. , dela Vina, Celia B.

To determine if progenies from the cross between *Musa textilis* Nee ($2n = 20$) and *Musa balbisiana* Colla ($2n = 22$) produced at the Institute of Plant Breeding (IPB), University of the Philippines Los Banos are true hybrids, abaca cultivars (Abuab and Inosa), a banana cultivar (Pacol), and their back crosses (BC1, BC2, and BC3) were characterized morphologically and cytogenetically. Agronomic characters and fiber quality assessment through ANOVA and pairwise analysis revealed significant differences in tensile strength and agronomic parameters, namely, fiber quality and percent fiber recovery, except for leaf sheath number and girth measured at the top. This confirmed the recovery of recurrent parent genome (abaca) until the third generation of backcrosses. Moreover, this study reports the successful optimization of cytogenetic techniques. The most favorable time of root tips collection was from 10:00 a.m. to 10:30 a.m. due to the high number of dividing cells observed compared to other time slots tried. Two-hour cold shock pre-treatment resulted in considerably larger chromosomes, and higher number of well-spread prometaphase cells that helped in the construction of karyograms. Chromosome characteristics based on chromosome count and relative length were determined and compared among plant samples. Comparative karyotyping revealed a diploid chromosome number of $2n = 20$ for abaca cultivars and hybrids. Inosa, another cultivar of *M. textilis* Nee, was observed to have a diploid chromosome number of either $2n = 20$ or $2n = 22$, in contrast to an earlier report of $2n = 17$ to $2n = 23$. **(Author's abstract)**

Keywords: *Chromosomes, Hybrids, Mitosis, Musa textilis Nee, Agriculture*

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Nutritional Assessment of the Philippine Collection of Gabing San Fernando (*Xanthosoma sagittifolium* (L.) Schott, Melet) Corms and its Potential as Food and Feed Substitute for Cassava (*Manihot esculenta* Crantz)

Mateo, John Marty C. , Villavicencio, Maria Lea H. , Ignacio, Rhessa Miren A. , Villancio, Virgilio T. , Bulatao, Mary Jean G. , de Chavez, Hidelisa dR. , Garcia, Jose Nestor M.

A total of 51 accessions of Gabing San Fernando (GSF) (*Xanthosoma sagittifolium* (L.) Schott, Melet), also known as new cocoyam, yautia, and tannia collected from 27 provinces in the Philippines, were characterized for their nutritional and anti-nutritional value. Nutritional characterization included proximate analysis, determination of starch content and calculation of food energy content, and quantification of oxalate. Proximate composition showed the following ranges: moisture, 53.34- 81 .01%; fat, 0.28 - 0.71%; protein, 2.07 - 6.18%; ash, 0.69 - 2.13%; and % nitrogen free extract, 13.31 - 39.11%. Starch content ranged 77.34 - 93.82% {dw basis) and food energy content, 322.53 to 395.26 (kcal 100g⁻¹) . Oxalate, the anti-nutritional factor of GSF, ranged 78.69 to 222.13 (mg 100g⁻¹). Food energy content of the GSF accessions had high positive correlation with the starch content ($R^2 = 0.9852$). GSF and cassava showed comparable amounts of fat and crude fiber. On the other hand, GSF showed superior energy and protein content, 121% and 334%, respectively, compared to cassava. **(Author's abstract)**

Keywords: *Agriculture, Cassava, Food and feed, Gabing San Fernando, Nutritional value, Oxalate content, Xanthosoma sagittifolium*

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Physiological and Physicochemical Changes in Guava (*Psidium guajava* L. cv. Queso de Bola) Fruit Stored at Different Temperatures

Rodeo, Arlan James D. , Gonzales, Daphne Cassandra H. , Esguerra, Elda B.

The effect of storage temperature on the physiology, physicochemical attributes and shelf life of guava (*Psidium guajava* L cv. Queso de Bola) fruits stored at 15°C, 20°C and ambient temperatures (32 ± 2°C) was studied. Low temperature slowed down the respiratory activity of the fruit 'Queso de Bola' guava did not exhibit a typical climacteric pattern of respiration and produced only a small amount of ethylene. Total soluble solids content of the fruit was low and did not increase much while titratable acidity remained constant during storage. Ascorbic acid content decreased during storage, but degradation was slow under low temperature. Fruit had a storage life of 7, 11 and 19 d under ambient temperatures, 20°C and 15°C, respectively. Storage at 15°C for 2 wk maintained the sensory quality, slowed down ascorbic acid degradation, reduced the weight loss, prevented shriveling and delayed the development of diseases. Shriveling and early onset of diseases caused a short shelf life for fruit kept at ambient conditions and at 20°C. Moderate peel browning was observed after 2 wk of storage at 15°C and following transfer to ambient conditions. Peel browning at 15°C cannot be solely attributed to chilling injury because slight browning was observed even at ambient temperatures. **(Author's abstract)**

Keywords: *Guava, Low temperature storage, Physicochemical changes, Postharvest physiology, Agriculture*

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Profiling and Analysis of Reproductive Phenology of Four Coffee (*Coffea* spp.) Species in the Philippines using the BBCH Scale

Salazar, Bong M. , Gunda, Danilyn M. , Lagrimas, Angelica Joy M. , Santos, Primitivo Jose A. , Del Rosario, Edwin E.

In the Philippines, highly asynchronous initiation of coffee inflorescence translates to expensive, laborious, and protracted harvest period which can last up to 6 months. Sound and sustainable management intervention to address this concern, however, is currently not available as basic information on coffee reproductive physiology is still wanting. Thus, this research aimed to elucidate the physio-morphological complexity of reproductive phenology of four commercial coffee species (Robusta, Arabica, Excelsa, and Liberica) in the Philippines using the Biologische Bundesantalt, Bundessortenamt, and Chemische Industrie (BBCH) scale. The experiment was conducted in Los Banos, Laguna from November 2015 to April 2017, wherein plagiotropic branches with emerging inflorescences (BBCH 51) were tagged and periodically monitored until the ripe berry stage (BBCH 88) to quantify morpho-developmental changes independent of variation in timing. Our results showed that while the over-all developmental pattern was comparable across species, there were distinct species-specific variations in terms of bud/flower/berry morphologies, and in terms of timing, pacing, and duration of each phenophase. Two sigmoidal growth curves were noted: first, from inflorescence emergence until anthesis (BBCH 69), and second, from pericarp development (BBCH 71-77) to seed development (BBCH 77-88). A spike in rainfall (≥ 320 mm) initiated budbreak (BBCH 53), beyond which species variation became more significant especially during berry development and ripening. Large-fruited species (i.e. Excelsa and Liberica) had higher heat unit requirements (GDD) compared to small-fruited species (i.e. Robusta and Arabica). From inflorescence emergence to berry ripening, Arabica, Robusta, Excelsa, and Liberica coffees required 6706 GDD, 7181 GDD, 715 GDD, and 7519 GDD, respectively **(Author's abstract)**

Keywords: *Coffee, Reproductive phenology, BBCH, Growing-degree days, Agriculture*

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0043

Profiling and Biochemical Identification of Potential Plant Growth-Promoting Endophytic Bacteria from *Nypa fruticans*

Fernando, Trinidad C. , Cruz, Jayvee A.

Nypa fruticans (Nipa palm) is a potential source of endophytic bacteria that produce substances such as antimicrobials, enzymes, and plant growth-promoting compounds that can be useful in agricultural crops such as rice. In this study, we identified endophytic bacteria aseptically isolated from different parts of *N. fruticans* that may be responsible for plant growth promotion. Using Biolog® Gen III Microbial Identification System, 18 genera of endophytic bacteria consisting of 51 isolates were identified. Genus *Pantoea* comprised 18% of the population, followed by *Enterobacter* (14%), *Bacillus*, (12%), *Klebsiella* (10%), *Raoultella* (8%), *Pectobacterium* (6%), *Serratia* (6%), *Tetragenococcus* (4%), and *Massilia* (4%). Additionally, 2% of the population comprised of *Achromobacter cholinophagum*, *Citrobacter koseri/youngae*, *Colimonas fungivorans*, *Cronobacter dublinensis* subsp. *lausanensis*, *Curtobacterium citreum*, *Oligella urethralis*, *Paenibacillus amylolyticus*, *Providencia stuartii*, and *Shewanella algae*. Profiling of the 51 endophytic bacterial isolates from the different parts of nipa palm collected from three provinces (Agusan, Bulacan, and Quezon) showed that these consisted of 9 isolates from the roots, 12 isolates from the leaves, and 30 from the stalks. Of the 51 endophytic bacterial isolates biochemically identified, 42 produced indole-acetic amino acid (IAA), 6 produced siderophore, 27 showed 1-aminocyclopropane-1-carboxylic acid (ACC) deaminase activity, 37 dissolved precipitated tricalcium phosphate, 36 fixed nitrogen, and 12 hydrolyzed starch. The results showed that *N. fruticans* hosts a variety of interesting bacteria that can potentially be useful as plant growth-promoter. However, it is recommended to evaluate their effectiveness as plant growth-promoters for important crops like rice. Likewise, 16S rDNA gene analysis should be conducted to verify the identities of these beneficial endophytic bacteria that are proven to produce growth-promoting compounds (**Author's abstract**)

Keywords: *Biolog System, Endophytic bacteria, Nypa fruticans, Plant growth-promoter, Agriculture*

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0044

Rainfall Indices for a Weather Index-Based Crop Insurance for Rice

Capistrano, Ailon Oliver V. , Quilang, Eduardo Jimmy P.

This paper analyzed the applicability of two sets of rainfall indices for a weather index-based crop insurance (WIBCI) for rice against low rainfall cover in Dumangas, Iloilo, WS2013. WIBCI is a new type of risk-transfer-mechanism (RTM) being tested in the Philippines that operates on the principle of having pre-agreed indices set per weather variable between the insurer and insured. Claims happen when these indices are considered "breached" or are not met in the case of low rainfall cover for a particular period. Operation-wise, the WIBCI product is revolutionary and could be a potentially quick-responsive climate change adaptation measure. However, new as it is, questions on the applicability of the product, particularly the indices, have to be evaluated and scrutinized. Validation points used in this study were breach assessments via the WIBCI product's procedure

and its consistency with actual drought incident reports. Average yields of the community relative to WIBCI farmers' individual yields were also used to validate consistency of breaches or no breaches among enrollees. Results of yield analysis relative to each community's average yields showed 95.7% of enrollees have low yields. When matched with the breaches assessed using the existing indices, only 52 enrollees breached the indices. Overall validity of the existing index via consistency of breached indices with low yields was only 70% but the 30% mismatch was still significant from an insurance business standpoint hence, a postulated set of indices specific to the location were developed for comparison. With the postulated indices, only 20 enrollees breached the indices which were much lower in number and more acceptable considering the absence of PAGASA's official drought incident reports. However, consistency analysis revealed that a much higher basis risk was incurred when using the postulated index which was mostly due to the mismatch of "no breaches" and low actual grain yields. **(Author's abstract)**

Keywords: *Low rainfall cover, Mismatch or basis risk, Plant water deficit (PWD) stress, Postulated index, Weather Index-Based Crop Insurance (WIBCI), Agriculture*

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0045

Response of MYKOVAM® Treated Lakatan Banana Plantlets to Water Deficit

Elleva, Lance Irvin F. , Garcia, Glaisa R. , Divina, II, Felen A. , Fabro, Dara Maria A. , Aguilar, Edna A. , Aggangan, Nelly S.

Lakatan banana (AA) is an economically important fruit crop in the Philippines and is one of the few fruits available year-round. Lakatan cv, compared with other local varieties has smaller root system and is known to be highly susceptible to water stress and most banana diseases. Previous studies have shown that MYKOVAM® (containing Arbuscular Mycorrhizal Fungi) inoculation of tissue-cultured banana at potting out and at 3-4 leaf stage enhanced root-VAM association. This pot experiment determined the shoot and root responses of banana with and without MYKOVAM® inoculation under water deficit condition. The treatments were: Well-watered with MYKOVAM® (T1), Well-watered (T2), Water deficit with MYKOVAM® (T3), and Water deficit (T4). Starting at field capacity, water was withheld until tensiometer reading reached 80 KPa. Water deficit was imposed for 14 d followed by a recovery period. Water deficit, regardless of MYKOVAM® treatment, significantly reduced the shoot (number of green leaves and pseudostem girth) and root growth (root volume, root length and number of root tips) and the relative water content of the youngest green leaf. In water deficit treatment, MYKOVAM® inoculated plantlets, upon watering after the imposition of water deficit, exhibited faster recovery and showed a significantly better growth (shoot and root) and higher relative water content compared to uninoculated plantlets. In well-watered treatment, MYKOVAM® treated plants had significantly better root growth and consistent shoot growth and relative water content compared to uninoculated plantlets. This study validated that MYKOVAM® inoculation improved the tolerance of the Lakatan banana plantlets to water deficit. Field studies are recommended to confirm the findings. **(Author's abstract)**

Keywords: *Arbuscular Mycorrhizal Fungi (AMF), Biofertilizer, Root mycorrhizal association, Water deficit, Agriculture*

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Rice Stories in the Mainstream Media: The Case of PhilRice

Nido, Mary Grace M. , Manalo, IV, Jaime A.

Drawing on from a media monitoring study conducted with the support of the Philippine Rice Research Institute's (PhilRice) Development Communication Division from August to December 2015, and using the Agenda Setting Theory as its theoretical lens, this paper argues on the need to explore more creative ways of presenting scientific information to the public. As it stands, good science is inadequate to merit attention by the mainstream media. PhilRice is the Philippines's lead agency for rice research and development. Specifically, the aim of this research was to scrutinize how the Philippine media reports about rice and rice agriculture. The monitoring covered 149 print publications, 70 websites, and 25 radio and TV stations. Content analysis was conducted paying careful attention to the types of stories media published, sections where the story landed, and public relations (PR) value of each story. This research also identified media champions with respect to the extent and PR value attached to their coverage of rice stories. Phone interviews and online conversations with media practitioners, i.e. news producers, researchers, and writers were conducted. Results reinforce earlier studies saying that agriculture stories, in this case rice, hardly occupy front pages or are given sufficient attention by the Philippine media. Controversy is a key element for agriculture stories to be published. Recommendations on enhancing public understanding of rice stories are presented. **(Author's abstract)**

Keywords: *Agenda-setting, Public understanding of science, Rice in the mainstream media, Science communication, Agriculture*

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Selection of Cassava (*Manihot esculenta* Crantz) Parental Lines for the Development of Varieties with High Yield and Resistant to Major Diseases

Lalusin, Antonio G. , Boguero, Aaron Paul B. , Abustan, Mary Ann M. , Mendoza, Mariecris Rizalyn R.

Cassava (*Manihot esculenta* Crantz) is a top crop commodity in developing countries. It ranks 3rd as the most important food crop next to rice and corn. There is wide diversity and distinctiveness among the heterozygous plants that can contribute to the upgrading of genetic resources for cassava varietal improvement programs. A total of 276 cassava accessions were collected from different provinces in the Philippines. These collected accessions were evaluated and characterized using morphological characters and molecular markers. An average of 0.76 Shannon-Weaver index obtained from the morphological data showed that the accessions are highly diverse. Molecular markers, on the other hand, were used to screen the diversity of the collected accessions. At 0.48 similarity index, a total of 7 clusters were generated using the binary data from the SSR primers. Accessions that grouped in cluster 6 showed the highest average yield of 22.2 t ha⁻¹. Some of these markers can also be applied directly in the cassava breeding program since they are gene-specific markers for interesting traits. Gene-specific primers were also used to screen for CMV resistance, early bulking and cyanogenic potential. Based on the markers and yield parameters, 45 promising accessions were selected and 39 out of the 45 showed resistance to CMO. These accessions also did not exhibit any symptoms, unlike the accessions planted in the border. Using the early bulking markers, 34 accessions showed positive results. However, only 5 accessions were able to exhibit positive results on the markers for cyanogenic potential, which means that majority of the accessions are edible or with low cyanide. Unfortunately, markers for CaWB were not able to identify potentially resistant members of the collection. After determining the yield of the accessions, a total of 45 elite accessions were selected with high yield, high starch content, as well as CMV resistance, and early bulking traits. The selected superior lines would undergo hybridization to produce promising lines that can be released in the future as a commercial variety. **(Author's abstract)**

Keywords: *Cassava accessions, Molecular markers, High yielding varieties, Resistance, Agriculture*

SNP Discovery and Genetic Clustering of Philippine 'Carabao' Mango (*Mangifera indica* L. cv. 'Carabao') using Genotype-By-Sequencing (DArTseq)
Lachica, John Albert P. , Vilela, Julianne A. , Santos, Maura Mercedes L. , Ocampo, Eureka Teresa M.

Understanding the genetic diversity of the Philippine 'Carabao' mango is important to identify possible genetic groups as source of traits for the improvement of the variety. Genotype-bysequencing (GBS) (using DArTseq molecular platform) was performed on 341 mango accessions from selected regions of the Philippines. Total single nucleotide polymorphisms (SNPs) numbered 31,208 which was filtered and imputed to 15,604 sequences. BLAST results for the SNPs show high homologies to genes from *Citrus sinensis* and *Brassica* sp. Functional variation was high on genes involved in cellular processes and signaling while 344 SNPs have no hits indicating possible novelty in *M. indica*. Homology of SNPs include agronomically important traits such as disease resistance and pathway genes for antioxidants and other secondary metabolites. Principal component analysis using the correlation of variances of the SNPs showed that genetic clustering of individuals accounted for 30% of the variation. There were four isolated groupings comprised of eight clusters based on locations and vaguely on their 'Carabao' characteristics. Group three clusters, VI and VII, contain most 'Carabao' accessions as well as red accessions, while isolated cluster VIII contains most commercial varieties such as Sweet Elena and Guimaras Super. Despite the high density of individuals and SNP markers found on all diversity analyses, consistent clustering of the 'Carabao' and non 'Carabao' accessions was not observed, but instead an increasing gradient of frequency can be traced in different groupings. Genomic clustering provided information on the relatedness of mango accessions across the Philippines while the SNPs provided genotypic information which can be utilized for marker-assisted selection in mango breeding. **(Author's abstract)**

Keywords: *Carabao mango, Diversity analysis, Genotype-by-sequencing, Genetic clustering, Single nucleotide polymorphism, Agriculture*

Somatic Embryogenesis, Regeneration, Phenotypic and Cytological Evaluation of Selected Philippine Papaya (*Carica papaya* L.) Genotypes
Magdalita, Pablito M. , San Pascual, Alangelico O.

The use of artificial seeds using somatic embryos induced from zygotic embryos of papaya was explored as a way of rapidly increasing plant production *in vitro*. Cross- and self-pollination of selected parents and inbred lines, respectively, was done to generate zygotic embryos as explants materials. These genetic materials contain tolerance to *Papaya ringspot* virus type-P (*PRSV-P*). Ninety to 120 d-old papaya fruit of selected inbred lines and hybrids were harvested and ivory-colored seeds were dissected to obtain the zygotic embryos. These embryos were explanted in MS medium supplemented with 10 mg L⁻¹ 2,4-D. A mixture of somatic embryos and calli developed on the apical dome of the zygotic embryos 1-2 months after explanting and continue to proliferate until the 6th month after explanting. Torpedo-type somatic embryos mixed with calli developed 8 months after explanting on De Fossard medium without plant growth regulators. These embryos regenerated into whole plants

with complete roots and shoot 7-8 months after explanting. They were acclimatized inside an acclimatization box placed inside the screenhouse and hardened seedlings were planted in the field and evaluated for phenotypic characteristics. Tree and fruit characteristics of the somatic embryo-derived plants are similar to the seed-derived control plants. Inbred line 4172 produced 8 sexually ambivalent male (SAM) plants out of 34 (23.5%) regenerants from somatic embryogenesis, which may indicate the occurrence of somaclonal variation. The SAM exhibited chromosomal aberrations such as laggards, bridges, univalent and unpaired chromosomes during metaphase of meiotic cells. However, these laggards catch up and were able to migrate to the opposite poles during telophase. The abnormal meiotic cells later reverted to normal leading to high pollen viability and germination. **(Author's abstract)**

Keywords: *De Fossard medium, MS medium, Papaya, Regeneration, Somatic embryos, Zygotic embryos, Agriculture*

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0050

Synthesis and Characterization of Nano Zinc Oxide Foliar Fertilizer and its Influence on Yield and Postharvest Quality of Tomato

Ybanez, Quincy E. , Sanchez, Pearl B. , Badayos, Rodrigo B. , Agravante, Josephine U.

Nanoparticles of ZnO were synthesized via an alkaline precipitation technique that is ideal for large-scale and cost-effective production, using ZnSO₄ and ZnCl₂ as starting materials. Scanning electron microscopy (SEM) analysis revealed that rod-shaped ZnO crystals with nanoscale dimensions were produced from both precursors, but ZnCl₂ produced smaller and less aggregated crystals compared to ZnSO₄. Using ZnCl₂ as starting material, we refined the synthesis parameters by varying the solution pH and temperature, drying and calcination temperature, and adding cationic surfactant. Scanning electron microscopy - energy dispersive x-ray spectroscopy (SEM-EDS) analysis verified the nano size of ZnO (average of 45 nm via SEM), with low degree of aggregation, and high chemical purity (59.96% Zn via EDS). X-ray diffraction (XRD) patterns identified hexagonal wurtzite structure with high crystallinity. Mineralogical analysis by X-ray fluorescence (XRF) showed that the nano ZnO were free from impurities (90.39% ZnO) while FTIR analysis authenticated the presence of Zn and O bonds. There was sufficient evidence to conclude that nano ZnO with high chemical purity, and suitable characteristics as Zn foliar fertilizer source, was successfully synthesized using ZnCl₂ as starting material. The synthesized nano ZnO (SNZ) was tested as foliar fertilizer on pot-grown 'Marimar' F1 tomato, and compared with bulk ZnO (BZ), commercial nano ZnO (CNZ), and granular zinc sulfate (ZS). Boric acid was incorporated to a separate set of the Zn foliar treatments (SNZ+B, BZ+B, CNZ+B, ZS+B) to determine the synergistic effects of Zn and B on the growth and yield of tomato. SNZ+B resulted in positive responses in Zn and B uptake and dry matter yield. Marketable yield was found to be significantly highest in SNZ+B. Statistically, SNZ+B was either better than or equal to the SNZ and CNZ+B treatments in terms of the growth and yield parameters. SNZ+B also led to significant improvements in fruit quality, including higher TSS, % TA, and ascorbic acid content. SNZ enhanced the agronomic effectiveness of Zn foliar fertilizers as evident in the improvements in yield components of tomato. Nanoscaling made ZnO more available to stomates, making nutrient use more efficient. It also resulted in increased number of particles per unit weight of applied Zn, while increasing the specific surface area and solubility of ZnO in water, thus enhancing plant uptake which ultimately led to improvements on yield as well as postharvest quality. **(Author's abstract)**

Keywords: *ZnO nanoparticles, XRD, FTIR, SEM, XRF, Foliar fertilizers, Tomato, Agriculture*

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Fil (S) S19 P53 103/1 2020

Technical assessment and policy analysis of bio-oil production from rice straw

Dizon, Lisa Stephanie H.

Pyrolysis of rice straw using a fixed bed-batch reactor was investigated to determine the effects of varying pyrolysis temperature (300°C, 400°C, and 500°C) and heating rate (low (0.2- 2.0°C min⁻¹), high (2.6-7.2 °C min⁻¹)) on pyrolysis products yield and composition. Bio-oil is a liquid fuel that may be refined or upgraded for advanced biofuels production. The gas product can be further utilized for energy production while biochar is used for combustion, for food and beverage industry as activated carbon and for waste treatment facility. A D-optimal coordinate exchange design of experiment was implemented and based on the results, the highest bio-oil yield obtained was 19.77% ww-1 at 400°C and low heating rate. The highest biochar yield (71.77% ww-1) was achieved at 300°C and high heating rate while the highest yield for gaseous product is equivalent to 19.65% under the conditions: 500°C and high heating rate. Compositional analysis of bio-oil via GC-MS was done to identify the compounds present which include N-containing compounds (amines and amides), oxygenates (carboxylic acids and ethers), aliphatics and aromatics. The physico-chemical characteristics of biochar were also determined. The H-C ratio of biochar ranges from 0.60 to 0.85 while the O-C ratio is between 0.16 to 0.22 which falls within the coal region suggesting that biochar has the potential use as solid fuels. The components of the gaseous product were also identified through GC and found to be mainly composed of H₂, O₂, N₂, CO, CH₄, CO₂, C₂H₄, C₂H₆, C₃H₆ and C₃H₈. Based on the policy analysis, it is recommended that rice straw conversion to bio-oil via pyrolysis should be adopted and implemented since the social benefit-cost analysis (SBCA) resulted to a benefit-to-cost ratio of 2.90 where the benefits are higher than the costs.

Keywords: *bio-oil, policy analysis, pyrolysis, rice straw, SBCA, Agriculture*

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2020,
(Filipiniana Analytics)

Technical Efficiency Analysis of Flint-Type White Corn Production in Quezon and Cagayan Provinces in the Philippines

Elca, Cenon D., Lapina, Geny F., Velasco, Dia M., Salazar, Francis Joshua D., Pajadan, Karen M., Ceguerra, Keno Leandro P.

Rice, white corn, saba, sweet potato and cassava are the Philippines' major food staples. Filipino consumers, however, generally prefer rice and so the country's farmers give it preference in land allocation. One way to address the Philippines' need for self-sufficiency is to promote the consumption and production of alternative staples like white corn, thus it is important to understand the condition of the country's white corn supply. Toward this end, this study estimated the technical efficiency of white corn and its corresponding determinants using econometric models. The goal was to assess whether there is room to improve productivity, which is essential in increasing the supply, so that it matches efforts to promote white corn consumption. The study used a cross-section of farm-level data on input and output coefficients and the socio-economic characteristics of 80 and 76 randomly selected flint-type white corn farmers in Quezon and Cagayan, respectively. The production models were estimated using the maximum likelihood method to generate: parameter estimates; socioeconomic factors affecting technical efficiency; and minimum, maximum, and mean technical efficiency scores. Productivity of flint-type white corn production in Quezon and Cagayan was found to be positively influenced by the amount of seed used, level of nitrogen fertilizer applied, and labor devoted to postharvest activities. This finding is consistent across the three production functions (i.e., Quezon, Cagayan, and pooled models). The mean technical efficiency score of farms is 64% in Quezon and 54% in Cagayan. Technical efficiency can be improved by increasing the

percentage allocation of produce sold to the market in Quezon and Cagayan. These results indicate that white corn productivity can potentially be improved in the Philippines. In essence, there is a need to close the gap between the minimum and maximum technical efficiencies of white corn farms in Quezon and Cagayan through technology-driven interventions. **(Author's abstract)**

Keywords: *Frontier, Productivity, Technical efficiency, White corn, Agriculture*

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2018 August,
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Fil (S) SB189 P45 43/2 2018

0053

Understanding Lodging Resistant Traits from Diverse Sugarcane Lines

Jongrunklang, Nuntawoot, Maneerattanarungroj, Praweena, Jogloy, Sanun, Songsri, Patcharin, Jaisil, Prasit

Lodging decreases sugarcane productivity due to a reduction in biomass production and cane quality. One strategy to overcome this problem is to breed for lodging resistant lines. This implies that lodging resistant traits in sugarcane are first identified. Therefore, the objective of this study was to identify lodging resistant traits in diverse sugarcane lines and their relationship with lodging. Eight diverse sugarcane lines were planted from January 2012 to January 2013 at the experimental farm of Mittr Phuwiang Sugar Mill, Thailand. The plants were arranged in randomized complete block design with four replications. After 12 months, canes in each plot were measured for lodging, stalk height, stalk diameter, leaf and stalk weight, root length density (RLD), root length density percentage (% RLD), and root anatomy. High stalk dry weight is a key factor that induces lodging in cane. Lodging resistant cultivars showed low stalk heights (248.2-263.7 cm) and stalk dry weights (4,884.6-5,482.8 g m⁻²) as well as a good partition of the root in the upper soil layer, providing a strong root structure. The appropriate balance between shoot and root parts is possibly contributing to low lodging incidences and maintains high yield. Therefore, breeding programs should focus on the selection of cultivars with large root systems in the upper soil layer to provide strong support to the aerial part. **(Author's abstract)**

Keywords: *Root length density, Stalk height, Stalk diameter, Stalk weight, Root anatomy, Agriculture*

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2018 August,
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0054

Utilization of Roxol Distillery Effluent as Fertilizer for Sugarcane Production

Guinabo, Eva C., Migo, Veronica P., Sison, Ma. Lourdes Q., Morales, Rustico C., Samson, Emmanuel G.

Distillery effluent is one of the by-products of alcohol production from molasses that contains considerable amounts of organic material, nitrogen, phosphorus and potassium and other minerals that make it a good candidate for fertilizer material. Experiments using Distillery effluent (DE) as fertilizer material were conducted to evaluate its effectiveness on plant and ratooned cane cultivar VMC 84-524 following Fertilizer and Pesticide Authority (FPA) protocols. Plant cane yield for all treatments were not significantly different. While RRC + RRE and 0.5RRC + RRE increased cane and sugar yields by 9-22% and 11-16%, respectively, RRE increased tonnage yield by 110% and Control for sugar yield by 15%. Meanwhile, ratoon cane and sugar yields were significantly different for all treatments. Over the control, RRC + RRE and 0.5RRC + RRE had higher cane and sugar yields of 80%-88% and 110%-119%, respectively. RRE increased tonnage yield by 40% while Control increased sugar yield

by 71%. Though soil pH, OM and available P concentration did not vary, RRE significantly increased soil potassium level. Soil microorganisms slightly decreased with Control, RRC and RRE. Albeit RRE + RRC ensures higher yields, results indicated that RRE can substitute RRC for sugarcane production considering sole utilization of RRE as fertilizer input for both plant and ratoon canes gave higher Partial Factor Productivity of 4.44 and 3.05, respectively, than when utilizing RRC that only achieved 3.37 for plant cane and 2.38 for ratoon. **(Author's abstract)**

Keywords: *Biochemical oxygen demand, Brix, Distillery effluent, Plant cane, Millable stalks, Ratoon cane, TC or L kg ha-1, L kg TC-1, Agriculture*

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2019 August,
(Filipiniana Analytics)
Fil (S) SB189 P45 44/2 2019

0055

Weed Management Practices and Herbicide Resistance in Weeds in Florida Citrus *Ramirez, Analiza Henedina M. , Futch, Stephen H. , Jhala, Amit J. , Abit, Mary Joy M. , Singh, Megh*

Herbicide-resistant weeds have been confirmed in some crop production systems in Florida but not in citrus groves. A grower survey was conducted in 2012 to determine the current weed management practices in Florida citrus and to determine awareness of citrus growers about herbicide-resistant weeds. A questionnaire was sent to 60 randomly selected growers, of which 33 turned in their responses representing 20% of the citrus growing area in Florida. Most of the respondents (47%) indicated that weed problem and species in Florida citrus did not change over the years with the top 3 problematic weeds: Spanishneedle (*Bidens* spp.), balsam apple (*Momordica charantia* L.), and panicums (*Panicum* spp.). Weed control in citrus groves is primarily with the use of herbicides applied alone, in tank-mixes, or applied sequentially in a year. Diuron, simazine, and indaziflam are the top 3 PRE herbicides while glyphosate, paraquat, and saflufenacil are the top 3 POST herbicides applied in Florida citrus. Glyphosate is the most commonly applied herbicide in the vast majority of citrus groves and as frequently as 3-5 times in a year. Citrus growers in Florida are aware of herbicide resistant weeds and their negative impact on citrus production. Although, there are no confirmed herbicide resistant weeds in Florida citrus, few weeds including Spanishneedle, ragweed parthenium (*Parthenium hysterophorus* L.), and nightshade (*Solanum* spp.) are inadequately controlled with the recommended rate of glyphosate, thus, should be tested for possible resistance. **(Author's abstract)**

Keywords: *Citrus, Glyphosate, Herbicide, Herbicide resistance, Weed survey, Agriculture*

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(Filipiniana Analytics)
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ANTHROPOLOGY

0056

Against federalism: why it will fail and bring us to the brink *Ocampo, Ro*

The proposed shift to a federal form of government is unlikely to succeed and may lead instead to the dismemberment of the Philippines. Given the dominant Pimentel model of the proposal, federalization will critically weaken the central government by sharing its sovereign powers, devolving most of its functions, and

substantially more of its resources with the new component states. Rather than promote equitable development, federalization, according to this model, will promote interstate competition and thus enable the better-endowed regions to develop farther ahead of the others. The central government will be too emaciated to equip weaker states to catch up, aggravating their laggard conditions and may further fuel secessionist sentiments. While one possible effect of federalization may be to inhibit centrifugal tendencies, it also risks sufficiently arming defection-prone states to secede and leads to the breakup of the nation-state. This article argues that, for all its faults, the existing unitary system is better because it can do at least one thing a federal government can no longer do, that is, redress imbalances in favor of lagging regions and retrieve devolved power if it is misused. Moreover, the parliamentary system that the proponents put on top of their federal structure may be able to do far fewer things faster and will be less democratic than the central as well as areal division of powers embodied in the existing unitary system of the Philippine government.

Keywords: *federalism in the Philippines, federal vs. unitary, government systems, Pimentel model, Anthropology*

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2017,
(Filipiniana Analytics)

0057

From ancient entrepôt to 21st century hub: a critique of Butuan City's administrative potentials at the geospatial margin

Gomez, Jose Edgardo A. Jr.

The City of Butuan in Agusan del Norte province occupies an important niche as a regional commercial and institutional center in the northeast quadrant of Mindanao island. Rooted in an identity dating back to precolonial times, it is building itself up as an emerging major hub of transportation and agricultural productivity in contrast to its less environment-friendly past as a logging and mining center. This research takes a critical stance by describing and reviewing the key advantages and disadvantages of Butuan City and its environs from a geospatial, administrative, and planning perspective. It shows that despite the recent emergence of political-institutional advantages, Butuan will always be constrained by certain locational features. Describing its present and potential land and sea usage, this study suggests other ways that Butuan City, in so far as it is a nexus of the province and of the Caraga Region, might yet continue to grow and profit from its peculiar placement in the far northeast of Mindanao.

Keywords: *Butuan City, cluster, infrastructure, periphery, reformist officials, satellite governance, Anthropology*

Philippine Journal of Public Administration, Volume No. 63 Issue No. 1, 1-25
2019,
(Filipiniana Analytics)

0058

Assessment of the implementation of the plastic bag reduction ordinance in Quezon City (2012-2016)

Braganza, Patricza Andrh

The Plastic Bag Reduction Ordinance has been implemented in Quezon City since 2012 to regulate the use of plastic bags in an attempt to address plastic pollution. This study assessed the implementation of the ordinance. Customers' use of recyclable bags was directly observed in four retail stores in the District 4 of Quezon City. A

survey was also conducted among 120 residents from six barangays comprising Area 24, District 4 of the city to gather data on awareness of and compliance to the ordinance. Focus group discussions and interviews with city government officials and store managers, among other stakeholders, were also conducted to enrich quantitative data. Survey results showed high level of awareness of the ordinance, but lower level of awareness of the green fund. Results of the chi-square test of independence revealed that awareness significantly differed across barangays. It is also revealed that the ordinance affects stakeholders in different ways, and that it may have somewhat reduced the percentage of plastic waste collected from households in the city. Lastly, retail stores face administrative challenges in translating green fund into meaningful environmental programs.

Keywords: *Plastic Bag Reduction Ordinance, green fund, policy implementation, Quezon City, Anthropology*

Philippine Journal of Public Administration, Volume No. 61 Issue No. 1-2, 20-42
2017,
(Filipiniana Analytics)

0059

Borders and decisionmakers: an institutional analysis of municipal merger in Japan *Tumanut, Mich*

Municipal merger has been the structural reform choice in Japan for over a century. For over two decades, it has been integral to the decentralization policy and in addressing economic stagnation, depopulation, and ageing population. While the literature on this is replete with analysis on its outcome (i.e., efficiency), application of an institutional approach particularly explaining decisiveness and temporal variation in municipal merger experience is sparse. Employing a case study approach, secondary sources and interviews with Japanese ministry officials and academics directly involved in merger, this paper re-examines this policy area framed by simplified and interpreted veto players theory. In municipal merger, Japan is found to have a small, locally-concentrated and cohesive constellation of veto players. Constitutional games played by the National Diet resulted in copious merger laws and amendments to instigate favorable territorial reform rules, and to influence congruence of preferences at collective-choice game played by municipalities. The tripartite function of merger reform agent (the Liberal Democratic Party) is instrumental in influencing cohesion in local councils, in informally invoking the emissary role of prefectural governments to promote merger, and in reshaping preferences of veto players through continuous amendment of merger law and insertion of incentives or disincentives.

Keywords: *gerrymandering, municipal consolidation, municipal merger, municipal reorganization, state rescaling, territorial reform, veto players, Anthropology*

Philippine Journal of Public Administration, Volume No. 62 Issue No. 2, 154-178
2018,
(Filipiniana Analytics)

0060

Eight waves of reform initiatives in Philippine port administration and governance *Basilio, Enrico*

This article is an account of the reform initiatives in the Philippine port sector, from the creation of the Philippine Ports Authority (PPA) in the 1970s as the main port planning agency, port developer, operator, and regulator, to the privatization of the operations of major public ports and terminals in the 1980s, the creation of independent port authorities in the 1990s, the establishment of the Strong Republic Nautical Highways (SRNH) in the 2000s,

and the current effort of the government to separate the conflicting regulatory and commercial functions of the PPA by amending its charter. Contributing to the success and/or failure of these reforms were the differing and, in some cases, conflicting interests of the reform actors and their degree of influence.

Keywords: *port administration, governance, privatization, private sector participation, political economy, policy reform, policy development, Anthropology*

Philippine Journal of Public Administration, Volume No. 63 Issue No. 1, 48-80
2019,
(Filipiniana Analytics)

0061

Empowerment, satisfaction, commitment, and retention intention among women in the military: the case of the Philippine Navy

Castillo, Michelle C.

State policies and programs in the Philippines have paved the way for more women to participate in the peace and security sector, particularly in the military, in recent years. These policies are incorporated in the larger gender and development (GAD) policy of the government. This article assesses whether the GAD policies and programs actually translate to the retention of female military personnel in the Philippine Navy, one of the three branches of service of the Armed Forces of the Philippines. It measures the satisfaction of female military personnel on policies on women empowerment and protection against sexual violence, together with job satisfaction and organizational commitment, and evaluates whether these factors have an effect in their decision to stay or leave the military profession. The revised gendered model shows that the most significant factor affecting the intention of female soldiers of the Philippine Navy to stay is organizational commitment while job satisfaction has more direct and significant positive effect on organizational commitment, with satisfaction on women empowerment and participation having a direct positive effect on both organizational commitment and job satisfaction. The female soldiers' experience of sexual harassment in the organization lowers their level of satisfaction on the organization's programs on women empowerment and participation.

Keywords: *job satisfaction, organization commitment, Philippine Navy, retention intention, women empowerment, Anthropology*

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(Filipiniana Analytics)

0062

Finding the Soul in Philippine Regulation: Amartya Sen, Social Justice and the Urban Development and Housing Act of 1992

Flores, Herisad

This study explores the limitations of the economic theory of regulation and finds that: (i) it fails to explain why some regulations pursue ethical and moral objectives; and (ii) it does not provide much normative guidance on how regulation could be used to bring about desirable social outcomes (e.g., social justice). In this light, the ideas of Amartya Sen on social justice are presented as a complementary, if not an alternative, approach in explaining and evaluating the pursuit of ethical objectives through regulation. A cursory assessment of the regulatory provisions of the Urban Development and Housing Act of 1992 and their implementation was done to demonstrate

the feasibility of using Sen's approach in this type of undertaking. In doing so, content analysis of the law, as well as a review of existing studies by other authors on its implementation, was employed in a summary study approach. The conclusion summarizes the insights from the assessment exercise and asserts the practicability of Sen's approach.

Keywords: *Amartya Sen, regulation, social justice, urban development and housing, Anthropology*

Philippine Journal of Public Administration, Volume No. 57 Issue No. 2, 141-166
2013,
(Filipiniana Analytics)

0063

Hope: dealing with wicked problems of government *Ocampo, Ro*

This essay explores the possibility of hope in dealing with difficult problems and failures of government through critical analysis and reforms of public planning and policy decisionmaking. It examines the assessments made by different authors of the failures of scientific planning and of the social sciences in informing planning and policy, and their proposals for improving the concepts and methods for social, historical, and policy research. The first section introduces the basic ideas about wicked problems thought inherent in government and life and about hope as a realistic view of goals that are difficult but not impossible to reach. The succeeding sections deal with: (a) alternative modes of planning and decisionmaking; (b) accounts of the persistence and failings of grandiose schemes of "high-modernist" statecraft and prescriptions to make planning more responsive to the complexity of unplanned development; (c) efforts to explain the failures of social science as due to its mistaken emulation of the hard sciences and to re-orient it also toward prudential or practical wisdom; (d) long histories of why the West came to dominate the world, the choices made by some societies that led to their demise or success in overcoming crises and ideas about how to improve history as a science; (e) unconventional innovations advocated in economic development planning and information systems design; and (f) my own concept of a middlerange bridge between competing reform proposals, as suggested by the notions of policy versus basic research and framework for understanding institutional diversity at sub-system or local levels of governance. Given the foregoing premises, we can hope to deal effectively with wicked problems of government.

Keywords: *governance, reforms, public planning, policy decisionmaking, scientific planning, research framework, Anthropology*

Philippine Journal of Public Administration, Volume No. 62 Issue No. 2, 179-194
2018,
(Filipiniana Analytics)

0064

Improving human resource capacity: exploring certification in local governments *Calugay, Zita Concepci*

The proposed institutionalization of certification pathways for local government officers and staff is a step towards the continuing capacity building to raise the qualifications standards and improve the professionalization of the local government bureaucracy. Certification as a concept serves to validate that the local officers and staff possess and are able to demonstrate the required competencies for the job in accordance with set standards, and thus counteract the common perception that they are inefficient, lacking in skills, and hired based on political influence.

Two existing and comparable certifications systems, namely, the Technical Education and Skills Development Authority (TESDA) national certification system for technical and vocational skills, and the Local Government Training Package in Australia are analyzed in formulating a model for local government certification system. The proposed local government certification system will require policy reforms geared towards the recognition of the local government sector as an industry and establishment of a qualifications framework for the local government industry. Different institutional arrangements or modalities including the centralized, collaborative, privatized and mixed models may also be explored in pursuing the certification system.

Keywords: *certification, human resource management, local government, local government personnel, certification in local government, Anthropology*

Philippine Journal of Public Administration, Volume No. 57 Issue No. 2, 115-140
2013,
(Filipiniana Analytics)

0065

Integrated approach for smart city index development: from concept to indicator weighting *Zou, X*

Smart city (SC) initiatives are the new megatrend in urban development. Several concepts and frameworks have been proposed to interpret what constitutes smart cities, but they have not yet reached universal acceptance. This study aims to propose a new conceptual framework for smart cities with an integrated index for better understanding and practical implementation of SC projects. The conceptual framework is proposed after reviewing SC literature under policy analytical method. Based on the framework, an index consisting of six domains, 18 aspects and 36 supporting indicators is proposed. The analytical hierarchy process (AHP) was applied for indicators weighting for prioritization or key performance indicator (KPI) selections. This study would contribute to more insights in understanding smart cities and their evaluation for policymakers, academia, urban managers and practitioners.

Keywords: *smart city, urban development, smart city framework, analytical hierarchy process, Anthropology*

Philippine Journal of Public Administration, Volume No. 62 Issue No. 1, 1-20
2018,
(Filipiniana Analytics)

0066

Islam, Bangsamoro and democracy *Rasul-Bernardo,*

Despite its potential for growth and development, the Bangsamoro region has seen decades of demographic marginalization, repression, and underdevelopment. These social problems, which were attributed to colonialization, are further aggravated by armed conflict between rebel groups and the government, and weak legal framework for regional autonomy. In her speech, Amina Rasul-Bernardo argues that the Bangsamoro conflict can only be addressed with a better understanding of its history and context. Rasul-Bernardo urges the passage of a Bangsamoro Basic Law that strengthens regional autonomy and ensures genuine, sustainable development in the region.

Keywords: *Bangsamoro conflict, Bangsamoro history, regional autonomy, Anthropology*

Job satisfaction of disaster responders: the response operation for the APEC economic leaders meeting 2015

Perez, Joe-M

Disaster responders work to ensure the safety and security of communities during emergencies. However, the job satisfaction of disaster responders in the Philippines has not yet been thoroughly analyzed as a subject of research in the field of organization studies. The article examines the job satisfaction of disaster responders mobilized by the National Disaster Risk Reduction and Management Council (NDRRMC) during the Asia-Pacific Economic Cooperation Economic Leaders' Meeting held from 18 to 19 November 2015 in Pasay City. Using Frederick Herzberg's Two-Factor Theory as the framework, it analyzes how motivation, hygiene, and demographic factors affect the job satisfaction of disaster responders. Findings reveal that the job satisfaction of disaster responders is positively affected by recognition, responsibility, and relationship with peers, but negatively affected by age. Furthermore, motivation factors significantly affect job satisfaction. Notably, the significant job satisfaction factors contribute to the innate desire of disaster responders to help others in times of emergencies. The article confirms the assumption of the Two-Factor Theory that motivation affects job satisfaction.

Keywords: *disaster response, job satisfaction, Two-Factor Theory, Anthropology*

The mainstream discourse on good governance for developing countries: issues and challenges

Raquiza, Ma. Victor

Good governance is widely viewed as a requisite to achieving economic growth and development especially for developing countries. Amidst the variety of good governance discourse given the elasticity of its definitions and dimensions, the dominant one is that championed by international financial institutions, in particular the World Bank and, oftentimes, the economic policy elites in a number of developing countries. This governance paradigm essentially seeks to enhance a country's market operations and articulates the institutional requisites to make this happen. There are many conceptual, methodological, and practical—including implementation—issues, however, that afflict the mainstream good governance paradigm, raising serious questions about its intellectual moorings and relevance for developing countries.

Keywords: *mainstream governance discourse, structural adjustment program, developing countries, foreign aid, Anthropology*

NPM, business process re-engineering and local governments
Ilago, Simeon A

The article explores the process of re-engineering in the business permitting and licensing systems (BPLS) of local governments over a five-year period (2010-2015). Review of secondary data and official documents on the BPLS reform program and process analysis of the streamlining approaches used by two local government units (LGUs) for their BPLS procedures both reveal differences, limitations, and constraints in implementation at the local level. The article argues that, despite the attempt to converge BPLS streamlining efforts by issuing uniform standards and guidelines, implementation varies due to the decentralized and political context, the local government officials' understanding of the process and its elements, and their perception of the policy problem. The article then suggests areas for future research along this line.

Keywords: *new public management, business process re-engineering, business permitting and licensing system, local government units, Anthropology*

Philippine Journal of Public Administration, Volume No. 61 Issue No. 1-2, 1-19
2017,
(Filipiniana Analytics)

Public administration as a scholarly discipline today—and how ICT will affect it
Drechsler, Wolfgang

After sketching out how Public Administration (PA) scholarship looks today, this lecture asks how information and communication technology (ICT) will, or might, influence it in the near future. First, we look at what information and communication technology can already do today and how it has changed our life-world by 2017. Two critical, interlinked phenomena are then analyzed: MOOCs (massive open online courses) and their effects, and the current ability of algorithms to write a certain type of texts. These may have the effect to strongly enforce, even lock in, the current tendencies of PA, but they may also give rise to an altogether different kind of development of scholarly inquiry in the discipline and beyond.

Keywords: *Public Administration, ICT, algorithms, MOOCs, Anthropology*

Philippine Journal of Public Administration, Volume No. 61 Issue No. 1-2, 127-141
2017,
(Filipiniana Analytics)

Public administration as design
Ocampo, Ro

Since the close of World War II, Public Administration students have been urged to move from the concept of the discipline as doing and deciding to that of designing, i.e. elaborating prescriptions in the manner suggested for policy vs. academic research. Design had long been a part of planning for the built environment (architecture, city planning, and urban design). Since the publication of Herbert A. Simon's *The Sciences of the Artificial*, however, design has been taken up increasingly in the literature of public policy and administration. While still basically goal-oriented, this literature puts greater emphasis on the institutional context, on problem-definition and alternatives-generation, and on decision-making as a framework. Theoretical perspectives, concepts, strategies, and techniques have been developed for public policymaking, implementation, and organizational design. This article attempts to assess the progress of design ideas, glean fundamental points from the literature, and suggest how design may deal meaningfully with some PA issues in the Philippine context, with the hope that they will apply as well to larger contexts.

Keywords: *design, decision-making, policy design, social planning, heresthetics, bricolage, Anthropology*

Philippine Journal of Public Administration, Volume No. 57 Issue No. 2, 200-224
2013,
(Filipiniana Analytics)

A review of citizen participation issues, responses, and prospects for reform in local development councils
Medina-Guce, Cz

This article conducts a review of citizen participation in local governance within the context of the local development councils (LDCs). It argues that the Local Government Code has prescribed citizen participation with a limited set of standards, namely, the 25% civil society membership in the LDC and the administrative indicators of activities that the LDC must perform. The Code and subsequent LGU performance measures it influenced have insufficiently addressed the roles to play and capacities needed by civil society to realize higher levels of citizen participation in the LDCs. Moving forward, the study takes stock of citizen participation initiatives that make explicit the roles and capacities of civil society organizations in local decision making and draws lessons to suggest prospects for deepening and increasing citizen participation in LDCs. The article ends with a note that citizen participation should be in the core agenda of proposed amendments in the Code.

Keywords: *local development council, local government units, citizen participation., Anthropology*

Philippine Journal of Public Administration, Volume No. 61 Issue No. 1-2, 43-70
2017,
(Filipiniana Analytics)

Social network analysis on the information exchange of Sorsogon City's CDRRMC during Typhoon Nina
Buenaobra, Nissi Abigail J.

The local government units (LGUs) act as frontline agencies in disaster response. To ensure the welfare of their constituents, they perform necessary emergency measures before, during, and after disasters. Crucial to the LGUs' role is an effective information exchange network with other government agencies, private entities, and nongovernment organizations. Information exchange during disaster response has been a recurring challenge for authorities as the variables are complex, the environment is unpredictable, and the information demanded and supplied varies. By using social network analysis (SNA), this study explored the information exchange in the interorganizational network of key actors during the disaster response for Typhoon Nina (Nock-Ten) in Sorsogon City, Philippines in 2016. By generating a visual map of the network, SNA enabled the authors to identify the possible information exchange failures, central suppliers and consumers of information, vehicles of information, and macro-level assessment of its effectiveness. This article strengthens the proposition that the actors in the communication network are all essential in the prompt delivery of services during the typhoon. The evident interaction of actors further established a holistic and substantive information, which helped them make informed decisions for their response efforts.

Keywords: *information exchange, communication network, interorganizational network, social network analysis, disaster response, disaster risk reduction and management council, Anthropology*

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 2019,
 (Filipiniana Analytics)

Do the regional development councils matter in promoting regional development?: a historical evidence
Celestino, Ali

As early as the 1970s, regional development has been adopted by the government as both a goal and strategy for national development. The regional development councils (RDCs) were created to play a critical role in the promotion of regional development. It has been almost five decades since their existence but regional disparities in the country still remain a reality putting to doubt their efficacy. In the light of the federalism debate which enkindled renewed interest in regional development, this article reviews the historical performance of the RDCs to aid policymakers in coming up with policy alternatives to the RDC system. What ails the RDCs? How can they be revitalized? These are some questions central to the assessment of their performance in promoting regional development.

Keywords: *decentralization, regionalization, regional development, administrative coordinating mechanisms, regional disparities, disjointed planning-budgeting, Anthropology*

Philippine Journal of Public Administration, Volume No. 62 Issue No. 1, 21-47
 2018,
 (Filipiniana Analytics)

Transport priority for infrastructure vs. services: BBB and urban transport policy *Ocampo, Rome*

The Build, Build, Build (BBB) Program was launched by the Duterte administration in 2017 as its strategy to hasten economic growth and deal with transport problems, including the critical traffic congestion in Metro Manila. Implementing BBB, however, may be easier ordered than done. This policy note tries to show how BBB is part of the legacy of historical and present-day partiality to road-building. Caution is particularly called for in using road infrastructure, which have been hobbled by various constraints, which have been hobbled by various constraints, which have been hobbled by various constraints, as the leading solution to traffic congestion and other transport problems in large urban areas. The challenges in transport planning and design are much more formidable, as indicated by the shortcomings of past plans and projects against the problems. The roadbuilding solution to traffic congestion is short-lived in effectiveness due to induced travel demand. Studies abroad show that this is a complex phenomenon in which land development along road improvements influence traffic and deserve systematic attention. Such studies should also be undertaken in our metropolitan areas to ascertain whether and to what extent the findings abroad apply to our context. The article concludes with suggestions for attending to some unfinished business in urban transport policy, planning, and administration. It ends with parting notes on the study of public services and Public Administration.

Keywords: *transport infrastructure, transport services, Duterte administration, transport planning, Anthropology*

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2019,
(Filipiniana Analytics)

Untwining twinning: a cursory examination of sister city relations in the Philippines *Berse, Kristoff*

The latter half of the 20th century saw the active interlinking of cities globally and domestically, facilitated in large part by the proliferation of sister city or town twinning arrangements. However, while this has been taking place steadily across and within countries, few studies have been made, if at all, looking at the specific experience of local authorities from the so-called South in general, and the Philippines in particular. This article attempts to fill this lacuna by examining the nature and scope of bilateral sister city relationships among local authorities in the Philippines. Findings from a mixed-mode survey (41% response rate, 144 cities) administered in 2015-2016 show that study visits and information exchange account for most of the interconnectivity of local governments. More than half of the participating cities organized study visits related to local economic promotion (LEP) and disaster risk management (DRM). But the potential for collaborative problem-solving or even co-production of knowledge to improve DRM, LEP, or any other aspect of urban management has yet to be fully realized. From a network perspective, the interconnectivity between and among local governments was found to be weak, with many of the relations seemingly established independent of preexisting ties. In many cases, the partnership seems to be anchored on big sister-little sister arrangement. Structure-wise, there appears to be no systematic process of matching the needs and resources of the participating local governments, other than to establish political ties that may or may not be tapped to improve DRM or facilitate LEP by either party. Given its very limited practice and benefits, sister cities are not well monitored and sustained. Changes in leadership and constraints in budgeting and staffing also render the partnership spotty or mostly non-functional.

Keywords: *sister cities, town twinning, city-to-city, interlocal cooperation, network analysis, trans-scaling, Anthropology*

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2018,

A VSO-Bahaginan framework for active citizenship

Alampay, Erwin Gas

This article is based on a commissioned work for the Volunteer Service Organization (VSO)-Bahaginan to develop its organizational framework for active citizenship. The primary objective of the paper is to define the role of VSO-Bahaginan in the development of active citizenship in individuals and communities. The resulting framework derived in this paper was based on surveys, interviews and focused group discussion with various VSO-Bahaginan stakeholders, including volunteers and staff. This complemented other workshop outputs and secondary data provided by VSO-Bahaginan. Taken together, these inputs were used in crafting an active citizenship framework that is culturally sensitive to Filipino values. It discusses how VSO-Bahaginan volunteers describe the progression of active citizenship, from kamalayan (awareness) to kamulatan (consciousness) to having a paninindigan (conviction), as an agent of change.

Keywords: *VSO-Bahaginan, active citizenship, volunteerism, civic engagement, Anthropology*

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2017,
(Filipiniana Analytics)

BIOLOGY

A AAA ATPase Cdc48 with a cofactor Ubx2 facilitates ubiquitylation of a mitochondrial fusion-promoting factor Fzo1 for proteasomal degradation

Nahar, Sabiqun , Chowdhury, Abhijit , Ogura Teru , Esaki, Masatoshi

Dynamic functionality of mitochondria is maintained by continual fusion and fission events. A mitochondrial outer membrane protein Fzo1 plays a pivotal role upon mitochondrial fusion by homo-oligomerization to tether fusing mitochondria. Fzo1 is tightly regulated by ubiquitylations and the ubiquitin-responsible AAA protein Cdc48. Here, we show that a Cdc48 cofactor Ubx2 facilitates Fzo1 turnover. The Cdc48-Ubx2 complex has been shown to facilitate degradation of ubiquitylated proteins stacked at the protein translocation complex in the mitochondrial outer membrane by releasing them from the translocase. By contrast, in the degradation process of Fzo1, the Cdc48-Ubx2 complex appears to facilitate the degradation-signalling ubiquitylation of the substrate itself. In addition, the Cdc48-Ubx2 complex interacts with Ubp2, a deubiquitylase reversing the degradation-signalling ubiquitylation of Fzo1. These results suggest that the Cdc48-Ubx2 complex regulates Fzo1 turnover by modulating ubiquitylation status of the substrate. **(Author's abstract)**

Keywords: *AAA ATPase, Cdc48, Degradation, Mitochondria, Ubiquitin, Biology*

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2020 March,
(Filipiniana Analytics)
F(S) QP501 J82 167/3 2020

The activity of the leaf essential oil of Philippine *Piper betel* against dermatophytes and *Candida albicans*
De Castro-Ontengco, Delia, Capal, Teres

Superficial mycotic infections are treatable conditions and they rank as the third most common illness globally, next to headaches and tooth decays. *Piper betel* L. is an aromatic plant with heart-shaped leaves that play a role in traditional medicine. This study harnessed the antidermatophytic potential of the essential oil extracted from the leaves of *Piper betel*, PBLO, Philippine variety. Using serial twofold dilutions of PBLO, including selected PBLO constituents, to challenge *Candida albicans* ATCC 10231 and clinical isolates of filamentous dermatophytes, results indicate that the Minimum Inhibitory Concentration, MIC, of the essential oil extract was 625 ug/ml for *C. albicans* and MICs of <156 ug/ml for *Microsporum canis*, *Microsporum gypseum*, *Trichophyton mentagrophytes*, *Trichophyton rubrum*, and *Trichophyton tonsurans*. Data on known PBLO constituents suggest that eugenol plays a major role in PBLO's antidermatophytic activity, followed by chavicol. Chavicol and eugenol exhibited the same MIC, 625 ug/ml, against *C. albicans* ATCC 10231. A eugenol MIC of <156 ug/ml was observed against *M. canis*, *T. mentagrophytes*, *T. rubrum*, and *T. tonsurans*; and 312.5 ug/ml against *M. gypseum*. Chavicol MICs of 312.5 ug/ml and 625 ug/ml were observed against *Trichophyton* spp. and *Microsporum* spp., respectively. Results of the study suggest the potential of *P. betel* essential oil as an alternative to conventional antifungals for the treatment of dermatophytosis. With the presence of many active constituents in PBLO essential oil, antifungal resistance is unlikely to happen, as multiple mutations will be required to overcome the mechanism/s of action of each of these constituents. (Author's abstract)

Keywords: *Candida albicans*, *Microsporum* spp, *Trichophyton* spp, *Eugenol*, *Chavicol*, *Minimum Inhibitory Concentration*, *P. betel's antifungal activity*, *Biology*

Philippine Journal of Systematic Biology, Volume No. 13 Issue No. 2, 15-18
2019,
(Filipiniana Analytics)
NP

Additions and corrections for liverworts and hornworts of Singapore
Shu, Lei, Lu, Chun-Hong, Zhu, Rui

Since the first record of liverworts and hornworts in Singapore was reported in 1845, the liverwort and hornwort flora of Singapore remain poorly known. Based on the examination on herbarium specimens kept in FH, GOET, SING, and SINU, as well as additional field collections, we found 12 liverworts new to Singapore. The occurrence of *Caudalejeunea cristiloba* and *Jackiella javanica* in Singapore is confirmed. Records of *Lejeunea parva* are erroneous because the voucher specimens from Singapore are assignable to *Lejeunea cocoes*. A total of 120 liverwort and hornwort species in 45 genera have thus far been recorded in Singapore, including 100 leafy liverworts, 12 simple thalloid liverworts, 5 complex thalloid liverworts, and 3 hornworts. The illustrations of *Cheilolejeunea malaccensis*, *Drepanolejeunea vesiculosa*, *Jackiella javanica*, *J. singaporensis*, and *Lejeunea cocoes* are provided. (Author's abstract)

Keywords: *Bryophyte Checklist*, *Hepaticae*, *Lejeuneaceae*, *New records*, *Oil body*, *Biology*

Philippine Journal of Systematic Biology, Volume No. 12 Issue No. 1, 12-21
2018,
(Filipiniana Analytics)
NP

Additions to Philippine slender skinks of the *Brachymeles bonitae* complex (Reptilia: Squamata: Scincidae) IV: Resurrection and redescription of *Brachymeles burksi*
Watters, Jessa L. , Davis, Drew R. , Maguire, Stephanie N. , Sheridan, Jennifer A. , Freitas, Elyse S. , Siler, Cameron D., Wang, Kai , Diesmos, Arvin C. , Brown, Raf

The diversity of Philippine amphibians and reptiles has increased over the last few decades, in part due to re-evaluation of species formerly believed to be widespread. Many of these investigations of widespread species have uncovered multiple closely related cryptic lineages comprising species complexes, each restricted to individual Pleistocene Aggregate Island Complexes (PAICs). One group in particular for which widespread cryptic diversity has been common is the clade of Philippine skinks of the genus *Brachymeles*. Recent phylogenetic studies of the formerly recognized widespread species *Brachymeles bonitae* have indicated that this species is actually a complex distributed across several major PAICs and smaller island groups in the central and northern Philippines, with numerous species that exhibit an array of digit loss and limb reduction patterns. Despite the recent revisions to the *B. bonitae* species complex, studies suggest that unique cryptic lineages still exist within this group. In this paper, we resurrect the species *Brachymeles burksi* Taylor 1917, for a lineage of non-pentadactyl, semi-fossorial skink from Mindoro and Marinduque islands. First described in 1917, *B. burksi* was synonymized with *B. bonitae* in 1956, and has rarely been reconsidered since. Evaluation of genetic and morphological data (qualitative traits, meristic counts, and mensural measurements), and comparison of recently-obtained specimens to Taylor's original description support this species' recognition, as does its insular distribution on isolated islands in the central portions of the archipelago. Morphologically, *B. burksi* is differentiated from other members of the genus based on a suite of unique phenotypic characteristics, including a small body size, digitless limbs, a high number of presacral vertebrae, the absence of auricular openings, and discrete (non-overlapping) meristic scale counts. The recognition of this central Philippine species further increases the diversity of non-pentadactyl members of the *B. bonitae* complex, and reinforces the biogeographic uniqueness of the Mindoro faunal region. **(Author's abstract)**

Keywords: *Biodiversity, Endemism, Faunal region, Fossoriality, Limb reduction, Biology*

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 2020,
 (Filipiniana Analytics)
 NP

Antibacterial Activity Against *Staphylococcus aureus* from Leaf Extracts of Talus (*Homalomena philippinensis*) and Boracan (*Merremia peltata* L. Merr.): Ethnobotanical Plants

Barrientos, Adrienne Martha , Miraflores Jason , Serisola, Reeza Shane , Mediodia, Catherine Joy

Ethnobotany is the study of the relationship between man and plants. An Ati tribe located at Brgy. Nagpana, Barotac Viejo used plants from their vicinity against 23 ailments, such as boils. Boils is commonly caused by *Staphylococcus aureus*, *Homalomena philippinensis* (talus) and *Merremia peltata* L. Merr. (boracan) are the plants used by the tribe against boils. This study, specifically, aims to compare the antibacterial effects of talus, boracan and the antibiotic, Ampicillin, and determine the minimum concentration of both plant extracts that can kill *Staphylococcus aureus*. The plants were collected from the Brgy. Nagpana, Barotac Viejo and identified and confirmed by an expert from University of the Philippines - Visayas. The bacteria was obtained from the Clinical Laboratory of University of San Agustin, where the experiment was also conducted. In conclusion, Talus and Boracan crude extracts showed no antibacterial inhibitory effect against *Staphylococcus aureus*. Only Ampicillin showed antibacterial activity against *Staphylococcus aureus*. Talus and Boracan also showed no minimum inhibitory concentration that can kill *Staphylococcus aureus*. **(Author's abstract)**

Keywords: *Staphylococcus aureus, Homalomena philippinensis, Merremia peltata L. Merr. , Biology*

0083

Antibacterial activity of Kantutay *Lantana camara* L. crude leaf extract
Sabiwang, Samira A. , Husain, Hanan M. , Deano, Ivanhoe B. , Almarez, Angeli M. , Alzate, Flore

The study aimed to determine the antibacterial activity of Kantutay (*Lantana camara* L.) crude leaf extract against Gram-positive and Gram-negative bacteria. Ethanolic leaf extract was prepared by rotavaporation and its antibacterial activity determined by the Kirby Bauer Method. Using Gentamicin (10 μ g) / Tetracycline (30 μ g) as positive control and distilled water as negative control, the extract was tested against reference strains of Gram-positive *Bacillus cereus* (ACTCC 11778) and *Bacillus subtilis* (ATCC 11774), and Gram-negative *Pseudomonas aeruginosa* (ATCC 25619) and *Escherichia coli* (ATCC 25922). The Zones of Inhibition (ZI) were measured in millimeters using a caliper. Results of the experimentation showed that the grand mean Zone of Inhibition (ZI) of Kantutay leaf extract against Gram positive bacteria *B. cereus* and *B. subtilis* were 11.9mm and 14.4mm, respectively; while a 0mm ZI was observed against Gram-negative *P. aeruginosa* and *E. coli*. Results further exhibit that Kantutay (*Lantana camara* L.) crude leaf extract was inactive in inhibiting *P. aeruginosa* and *E. coli* (gram negative bacteria) growth, partially active in inhibiting the *B. cereus* growth, and active against *B. subtilis*. Hence, it may be concluded that Kantutay crude leaf extract does not have antibacterial effect against Gram-negative bacteria like *P. aeruginosa* and *E. coli* but have antibacterial effect against Gram positive bacteria like *B. cereus* and *B. subtilis*. **(Author's abstract)**

Keywords: *Medical laboratory science, Kantutay Lantana camara L., Gram-positive bacteria, Gram-negative bacteria, Zone of Inhibition (ZI), Kirby Bauer Method, Philippines, Biology*

0084

Anticoagulant activity of horseradish *Moringa oleifera* and *Oregano coleus aromaticus* leaf extracts and kamias *Averrhoa bilimbi* fruit juice on human blood samples
Sapilan, Julidette B. , Sarpong, Ma. Lydia S. , Dayaganon, Avee Joy B., Dagoc, Angelie

Blood tests are routine laboratory analyses that require the use of anticoagulants like ethylene diamine tetraacetic acid (EDTA). Commercially prepared EDTA tubes are costly. The study aimed to investigate and compare the anticoagulant property of three plants namely horseradish (*Moringa oleifera*), oregano (*Coleus aromaticus*), and kamias (*Averrhoa bilimbi*) towards development of possible alternative for EDTA. *M. oleifera* and *C. aromaticus* ethanolic leaf extracts and *A. bilimbi* fruit juice were prepared by standard laboratory protocols. Human blood cells were appropriately NSS-suspended, stained, and treated with the plant extracts, analyzed microscopically and macroscopically and compared with cells treated with EDTA as positive control. Results showed that of the test treatments, *C. aromaticus* leaf extract showed the highest capability as an anticoagulant. *M. oleifera* leaf extract showed a similar anticoagulant effect but could hold the blood sample for a shorter period. *A. bilimbi* fruit juice exhibited the shortest period of anticoagulation and most clumping and crenation of cells. Statistical analysis using Analysis of Variance (ANOVA) of the experimental data demonstrates significant difference ($p < 0.05$) on the anticoagulant activity of the four treatments; meaning, *C. aromaticus*, *M. oleifera*, and *A. bilimbi* extracts and EDTA had varying in vitro capacity to hold the normal structure of the human blood cells. Post hoc multiple

statistical analysis showed no significant difference ($p < 0.05$) between *C. aromaticus* anticoagulant activity and that of EDTA as positive control; meaning, *C. aromaticus* leaf extract and EDTA showed comparable capacity to hold blood normal structure *in vitro*. Hence, *C. aromaticus* leaf extract can potentially be developed as an alternative to commercial EDTA as blood anticoagulant. **(Author's abstract)**

Keywords: *Medical laboratory science, Phytochemical assessment, Ethylene diamine tetraacetrid (EDTA), Coleus aromaticus, Moringa oleifera, Averrhoa bilimbi, Anticoagulant, Philippines, Biology*

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2013,
(Filipiniana Analytics)
NP

0085

Antimicrobial Activity of *Callyspongia* sp From Culasi, Antique Against Ice-Ice Promoting Bacteria, *Bacillus cereus*, *Brevundimonas diminuta*, and *Vibrio alginolyticus*
Elizalde, Marc Angelico, Herida, Nove Kris, Marcel Jaudian, Mediodia, Harold

Seaweeds are one of the Philippines' major exports. However, seaweed farms are often damaged by ice-ice, a disease condition that turns the branches of the seaweeds into white, fragile branches that easily come off. Previous studies have shown that *Bacillus cereus*, *Brevundimonas diminuta*, and *Vibrio alginolyticus* are known to be associated with and causes ice-ice disease. Methods known to use other organisms to control or inhibit the bacteria that cause the disease are polyculture cultivation and bioprotection. *Callyspongia* sp. was concluded to have potential as bioprotector in seaweed cultivation; however, other studies suggest that sponges at different locations may result to different antimicrobial activity due to the different symbionts present in different environments, which are responsible to the production of many chemical compounds. This study tested the antibacterial activity of *Callyspongia* sp. from Mararison Island, Culasi, Antique against *Bacillus cereus*, *Brevundimonas diminuta*, and *Vibrio alginolyticus*. *Callyspongia* sp crude extract was extracted using 200 mL of methanol for every 25 g of *Callyspongia* sp. Broth dilution test was used and serial dilution was performed to produce an eight-fold concentration. Each bacterium was inoculated into the treated test tubes containing the crude extract and three replicates were used. Data was collected using a spectrophotometer and was analyzed using ANOVA. Results showed that the crude extract had significant effects in the growth of *Bacillus cereus* and *Vibrio alginolyticus* especially in 4.8×10^{-3} g/mL and 4.8×10^{-4} g/mL concentrations and for *Brevundimonas diminuta*, extract concentration 4.8×10^{-3} g/mL significantly inhibited its growth. Results show that *Callyspongia* sp. has the ability to inhibit the growth of bacteria associated with and causing ice-ice disease and has the potential to be used as a bioprotector in seaweed cultivation. **(Author's abstract)**

Keywords: *Callyspongia sp, Brevundimonas diminuta, Bacillus cereus, Vibrio alginolyticus, Biology*

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2018 May,
(Filipiniana Analytics)
Fil (S) Q76 P45 1/1 2018

0086

Antimicrobial activity of *Mangifera indica* (Carabao Mango) fruit and seed extract
Merosa, Ellen Mae, Elizalde, Christine, Acanto, Christylene Mae, Sarabia, Ace Ron

Common bacterial infections are eliminated by means of commercially available antibiotics. Nonetheless, the presence of resistant strains of bacteria leads to ineffective treatment. One of the plants who were believed to possess an antimicrobial property is the *Mangifera indica*. This study aims to prove the idea that there is a

possibility that people can derive new drugs from this plant. Furthermore, this study intends to find out if there will be significant difference on the activity of ripe and unripe seed and fruit extracts against *Staphylococcus aureus* (ATCC 25923) and *Pseudomonas aeruginosa* (ATCC27853). The different plant extracts together with the positive and negative controls were impregnated into disks and placed into the agar plates to determine their zones of inhibition against the test bacteria. Statistical analysis showed a significant difference on the action of mango extracts against *S. aureus* and *P. aeruginosa*. Ripe fruit extract showed no activity against *P. aeruginosa* while ripe and unripe seed extracts were active with the ripe seed extract showing the highest inhibitory action. **(Author's abstract)**

Keywords: Antimicrobial, Zone of inhibition, *Mangifera indica*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, Philippines, Biology

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2013,
(Filipiniana Analytics)
NP

0087

Athyrium nakanoi* Makino (Athyriaceae), a new record from the Philippines and an identification key to the Malesian *Athyrium* Sect. *Polystichoides
Liu, Yea-Chen, Amoroso, Victor B., Coritico, Fulg

Athyrium nakanoi Makino is a new fern species record for the Philippines, discovered in Mt. Dulang-Dulang, Kitanglad Range, Mindanao, Philippines extending its original distribution from India, Nepal, Bhutan, China, Taiwan and Japan, Indonesia and Malaysia. Diagnostic description of the species is provided together with its distribution, conservation status and a dichotomous key to the Malesian *Athyrium* Sect. *Polystichoides*. (Author's abstract)

Keywords: Mindanao, Athyriaceae, Ferns, Pteridophytes, Biology

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NP

0088

Aurora kinase A-mediated phosphorylation of mPOU at a specific site drives skeletal muscle differentiation

Karthigeyan, Dhanasekan, Bose, Arnab, Boopathi, Ramachandran, Rao, Vinay Jaya, Shima, Hiroki, Bharathy, Narendra, Igarashi, Kazuhiko, Taneja, Reshma, Trivedi, Arun Kumar, Kundu, Tapas K

Aurora kinases are Ser/Thr-directed protein kinases which play pivotal roles in mitosis. Recent evidences highlight the importance of these kinases in multiple biological events including skeletal muscle differentiation. Our earlier study identified the transcription factor POU6F1 (or mPOU) as a novel Aurora kinase (Aurk) A substrate. Here, we report that Aurora kinase A phosphorylates mPOU at Ser197 and inhibit its DNA-binding ability. Delving into mPOU physiology, we find that the phospho-mimic (S197D) mPOU mutant exhibits enhancement, while the wild type or the phospho-deficient mutant shows retardation in C2C12 myoblast differentiation. Interestingly, POU6F1 depletion phenocopies S197D-mPOU overexpression in the differentiation context. Collectively, our results signify mPOU as a negative regulator of skeletal muscle differentiation and strengthen the importance of AurkA in skeletal myogenesis. **(Author's abstract)**

Keywords: *Aurora kinase A, DNA binding, Mitosis, mPOU, Skeletal muscle differentiation, Biology*

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2020 February,
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F(S) QP501 J82 167/2 2020

0089

Bio-Surveillance of Economically Important Insect Pests in a Mixed-Crop Agriculture System: Insights From DNA Barcodes

Nimanthika, Wathukarage Jayani, Senevirathne, Kalawanalage Sabeetha Iroshani, Ruwanthika, Herath Mudiyansele Iresha Chamali, Korallage, Ishani Sugandi Apsara, Rey, Jessica D.

Existence of variable life stages and body sizes and morphotypes in insects is a challenge in morphological identification, therefore . making DNA-barcoding a popular tool for resolving taxonomic cues which support as identification references. Insects associated with agriculture could be pests, disease-vectors or beneficial organisms, therefore, have a significant impact in global agricultural trade. Developing information libraries or databases of such insect species is vital for the purpose of plant quarantine regulatory functions. The study was conducted to detect and identify insect fauna associated with an export oriented mixed crop agriculture system in Sri Lanka . A total of 214 specimens were collected which summed to 162 unique taxa confirmed with DNA-barcodes of 658 base pair fragment in COI gene, using LCO1490/ HCO2198 primers. A total of 117 taxa were delimited to the species (78-previously recorded 39-newly-recorded during this study) and the rest were delimited to genus, family or order (35- previously recorded, 11- newly-recorded during this study). DNA-barcodes and the non-destructed specimens were deposited in the DNA barcode library and specimen collection consecutively established at the NPQS, Sri Lanka to facilitate future diagnostic activities. **(Author's abstract)**

Keywords: *Bio-surveillance, COI, DNA barcoding, Pests, Quarantine, Sri Lanka, Biology*

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2019 December,
(Filipiniana Analytics)
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0090

Blood mercury level of employees from selected small-scale minig industries in Maco, Comval Province

Libumfacil, Jhuana Mae S. , Barrete, Vanessa Jan O. , Rosalinda, Gilroy S. , Racacho, Dency Mae V. , Ribo, Annabe

Gold mining is economically significant yet it poses various harmful effects like mercury poisoning. The study determined the mercury level in blood samples taken from employees of selected small-scale mining industries in Barangay Limbo, Maco Comval Province. Specifically, it documented the profile of the miners in terms of age, length of employment, job description, and their corresponding blood mercury level and how this compares with the tolerable limit of mercury in the blood set by the DOH. Blood samples were collected by venipuncture and tested using Cold Vapor-Atomic Absorption Spectrophotometer. The findings of the study show that in terms of age; 6 miners were within the age of 16-30 years old, 3 miners were 31-47 years old, 2 were 48-62 years old, and 2 were 63-77 years old with mean mercury levels of 0.390 ppm, 0.097 ppm, 0.199 ppm, 0.149 ppm respectively. For the years of employment; 4 miners were active for <1 year while 8 miners were active for 2-3 year and only 1 miner was active for >3 years with mean mercury levels of 0.099ppm, 0.341ppm, 0.197ppm respectively. In

terms of job description, 6 were involved in crushing of ore in ballmill, 5 were involved in addition of mercury, and 2 were involved in recovering gold by torching with mean mercury levels of 0.398ppm, 0.073ppm, and 0.158ppm respectively. All these blood mercury levels exceed the tolerable limit of 0.015 ppm set by DOH. nonetheless, there was no significant difference in the level of mercury in the subjects' blood samples in terms of age, length of employment and job description. That the blood mercury levels of the subject all fell over the tolerable limit is alarming since the small scale mining industries included in the study mostly have young miners as employees. **(Author's abstract)**

Keywords: *Blood analysis, Mercury, Miners, Small-scale mining, Philippines, Biology*

Optima, Volume No. 1 Issue No. 1, 41-55
2013,
(Filipiniana Analytics)
NP

0091

Butterfly range extensions in the Philippines and Indonesia *Badon, Jade Aster T., Lohman, David*

Recent curation of the butterfly collections in the National Museum of Natural History in Manila, Philippines, and the McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, USA, resulted in new island records of *Ideopsis juvena luzonica* (Nymphalidae: Danainae) from Mabog Island in the Babuyan Islands, Philippines, *Cheritra freja pallida* (Lycaenidae: Theclinae) from Sebuk Island, Borneo, and *Eurema hiurai* (Pieridae: Coliadinae) in Zambales (Luzon) and Cotabato (Mindanao), Philippines. **(Author's abstract)**

Keywords: *Butterflies, Range, Philippines, Indonesia, Biology*

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2020,
(Filipiniana Analytics)
NP

0092

Callus Induction and Somatic Embryogenesis in *Nypa fruticans* Wurmmb Zygotic Embryo *Oguis, Georgianna Kae R. , Silvosa-Millado, Cyrose Suzie C. , Rivero, Gilda C.*

Nypa fruticans has been reported to be a potential source of ethanol. To date, there is no available protocol on tissue culture suitable for *N. fruticans* to produce superior and uniform planting materials for future wide-scale production. This paper investigated the influence on callus induction of various concentrations of 2,4-D and activated charcoal as well as the effects of three orientations of the explant on the media. Sixty-four percent of the explants cultured in full-strength MS media, supplemented with various combinations of different concentrations of 2,4-D and activated charcoal, produced protocorm-like structures in cultures with lower concentrations of 2,4-D combined with high concentrations of activated charcoal. Fifty-two percent of protocorm-like structures in T18 cultures significantly (p $<$ 0.05) **(Author's abstract)**

Keywords: *Activated charcoal, Callus induction, Somatic embryogenesis, 2, 4-D, Biology*

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2015 June,

Characterization of ectomycorrhizal fungi in association with *Eucalyptus pellita* F. Muell seedlings
Aggangan, Nelly S.,

This study aimed to determine the effectiveness of 14 ectomycorrhizal (ECM) fungi namely, *Amanita pantherina*, *Hebeloma cylindrosporum*, *Leccinum* sp., *Ramaria botrytis*, *Tuber puberulum*, *Lyophyllum shimeji*, *L. fumosum*, *L. decastes*, *Tricholoma porderosum*, *T. portentosum*, *T. matsutake*, *T. robustum*, and two isolates of *Pisolithus tinctorius* in promoting growth and nutrient content of *Eucalyptus pellita* under glasshouse conditions. One month old *E. pellita* seedlings were inoculated with ECM mycelia during transplanting into pots filled with autoclaved peat perlite vermiculite medium. All ECM fungi studied colonized 40-65% root tips of 4 month old *E. pellita* seedlings while roots of control plants were not colonized. Mycorrhizal plants grew better than the control counterpart. Height increased from 20-24% by six ECM while nine ECM increased total plant dry weight from 42 to 75% relative to the control. *Amanita* and *Ramaria* promoted higher leaf P content. *Lyophyllum decastes* promoted the highest root N, K, Mg, and Ca contents whereas PtMKACC promoted the highest root K, and leaf Mg and Ca content. *Tricholoma portentosum* was ineffective in promoting growth and nutrient content as exhibited by the lower growth and nutrient content of plants. Chlorophylls a, b and a+b were highest in plants inoculated with *Amanita* but comparable with the control. *Pisolithus* PtMKACC inoculated plants differed from the control plants and produced the highest carotenoid content. Transpiration rates and stomatal conductance were highest in the control plants. The results indicate that pine tree ECM fungi *Amanita pantherina*, *Ramaria botrytis*, *Lyophyllum fumosum*, *L. decastes* and *Pisolithus* MKACC can effectively promote growth of *E. pellita* seedlings under glasshouse conditions.

Keywords: *Amanita*, *Hebeloma*, *Lyophyllum*, *Pisolithus*, *Ramaria*, *Tricholoma*, *Tuber*, *Eucalyptus pellita*, ectomycorrhizal fungi, Biology

Characterization of Plant Growth-Promoting Diazotrophs from Salt-Affected Areas in the Philippines

Ong, John Daniel P. , Lantican, Nacita B. , Cruz, Wilma T. , Diaz, Ma. Genaleen Q. , Paterno, Erlinda S.

Soil salinity is an important factor limiting plant productivity worldwide. Studies have shown that plant growth-promoting bacteria can help plants tolerate salt stress. This study focused on the isolation and characterization of diazotrophs present in saline soils. Diazotrophs were isolated from the soil, plant rhizosphere and plant root samples obtained from Pampanga, Batangas, Iloilo, and Palawan in the Philippines. The 147 isolates were screened for 1-aminocyclopropane-1-carboxylic acid (ACC) deaminase activity, indole acetic acid (IAA) and siderophore production, and for phosphate solubilization. Ten isolates which tested positive for all or most of the plant growth-promoting traits were selected for further studies. BLAST analysis of the 16S rDNA showed that the microbial isolates were highly similar to members of *Enterobacter* sp., *Serratia* sp., *Pseudomonas* sp., *Haererehalobacter* sp., *Salinicola* sp., and *Mangroveibacter* sp. The *nifH* gene was detected in eight out of the 10 isolates. Under gnotobiotic condition, rhizosphere isolates AS10.2GPR and BPRP18.1 significantly increased the shoot dry weight of corn, cv IPB var 11 grown in Magenta jars supplied with nutrient solution amended with 150 mM NaCl (15 dS m⁻¹), by 71.78% and 69.59%, respectively, relative to the uninoculated, nitrogen-free control.

AS10.2GPR and BPRP18.1 were highly similar to *Serratia* sp. NH10 (100%) and *Enterobacter sacchari* strain HX148S (99%), respectively. **(Author's abstract)**

Keywords: *Plant growth-promoting bacteria, Diazotroph, Soil salinity, nifH, Biology*

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0095

Chemical toolbox for 'live' biochemistry to understand enzymatic functions in living systems

Komatsu, Toru , Urano, Yasuteru

In this review, we present an overview of the recent advances in chemical toolboxes that are used to provide insights into 'live' protein functions in living systems. Protein functions are mediated by various factors inside of cells, such as protein-protein interactions, posttranslational modifications, and they are also subject to environmental factors such as pH, redox states and crowding conditions. Obtaining a true understanding of protein functions in living systems is therefore a considerably difficult task. Recent advances in research tools have allowed us to consider 'live' biochemistry as a valid approach to precisely understand how proteins function in a live cell context. **(Author's abstract)**

Keywords: *Chemical biology, Enzymes, Fluorescent sensors, Biology*

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2020 February,
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0096

A comparison of native and non-native small mammals in adjacent karst and volcanic soil regions in NE Luzon, Philippines

Rickart, Eric A. , Heaney, Lawrence R. , Balete, Dan

Small mammal communities that occur in habitats on volcanic soil substrates have been extensively studied on Luzon Island, but those that occur in forest over limestone are poorly known and have not been directly compared to those over volcanic soils. We conducted field surveys of small mammals in forest over limestone from ca. 100 m to 590 m elevation in the vicinity of Callao Cave, and in adjacent lowland dipterocarp forest over volcanic soil from 490 m to 900 m, near the location of prior surveys from 1300 m to 1550 m on Mt. Cetaceo, an extinct volcanic peak in the northern Sierra Madre range. Despite moderately heavy disturbance to the habitats over karst (limestone) and moderate disturbance to forest over volcanic soils, we found native small mammals overall at levels of species richness and abundance similar to what we have documented elsewhere on Luzon over the same elevational range. Non-native mammals were present at all localities in the karstic habitat but were absent in all types of forest over volcanic soils, even in areas recovering from prior disturbance. Although non-natives were moderately common in karstic areas, they rarely were more common than native species, and non-native species were no more successful at invading the disturbed karstic habitat than the native species were at persisting there. The most abundant small mammal in dipterocarp forest over volcanic soil (*Apomys sierra*) was absent in karstic localities, despite occurring in adjacent areas at overlapping elevation. Overall, the difference between small mammals in karst and lowland dipterocarp forest was mainly due to species composition rather than total abundance. Comparisons with data from a prior study on the upper slopes of Mt. Cetaceo showed that total native

species abundance was highest in montane and mossy forest, typically about three times higher than in lowland dipterocarp forest. We confirmed the current presence of one species, *Apomys microdon*, reported as a fossil from Callao Cave, but the apparent absence of one other, *Batomys* sp.; both were from deposits dated as ca. 65,000 BP. We also summarize information about large mammals in the study areas. Further study of mammals in the distinctive forest over limestone is clearly needed. **(Author's abstract)**

Keywords: *Biodiversity, Biogeography, Cagayan Valley, Disturbed forest, Elevation, Fossils, Muridae, Sierra Madre, Soricidae, Biology*

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NP

0097

A correlation study on the hygienic practices and parasitic infection to the academic performance of the students in Waan National High School, Buhangin, Davao City
Montante, Monique , Espargoza, Kriza Karla , Deomampo, Hanna Lousie , Basoc, Regine , Cynthia D

Parasitic infections can cause mild discomfort and this may affect the academic performance of school-aged individuals. This study concerned the students living in the countryside who are not exposed to community health services such as de-worming. Volunteer students of Waan National High School, Barangay Waan, Buhangin District, Davao City were the respondents of the study. The study aimed to correlate the hygienic practices and parasitic infection to the academic performance of the students. Detection of parasitic infection was done through microscopic examination of feces/ stool samples obtained from the respondents using Kato-Katz technique and Direct Fecal Smear. A Survey questionnaire was used to evaluate the hygienic practices of the respondents and their average grades were the basis for their academic performance. From the results obtained, it showed that among the 22 respondents, only 2 were found negative of parasite infection. The common parasites that infected the students are: *Ascaris lumbricoides*, *Trichuris trichiura*, *Entamoeba coli*, Hookworm and *Enterobius vermicularis*. Based on the data analysed using Chi-square Distribution and Eta-Correlation Methods, results indicated that there is no correlation between hygienic practices and parasitic infection towards the academic performance of the students. **(Author's abstract)**

Keywords: *Correlation study, Hygienic practices, Parasitic infection, Academic performance, Waan National High School, Philippines, Biology*

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2013,
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0098

Crocodilians and fisheries in the Philippines: revisiting Fittkau's hypothesis
Alcala, Angel C. , Manalo, Rainier I. , Bucol, Abner A., Aspillia, Paulin

Crocodilians have been assumed to influence aquatic primary productivity and fishery yield. However, strong empirical evidence to support such claims is lacking. The long-standing assumption first hypothesized by Fittkau (1970), is that local fisheries (secondary productivity) in areas inhabited by crocodilians would be expected to improve. We tested this hypothesis at two locations in the Philippines, inhabited by the Philippine Crocodile (*Crocodylus mindorensis*) in Paghungawan Marsh in Siargao Island Protected Landscape & Seascape (SIPLAS), Jaboy, Pilar, Surigao Del Norte, and the Indo-Pacific Crocodile (*Crocodylus porosus*) in the Rio Tuba River,

Bataraza, southern Palawan Island. Water chemistry parameters, with emphasis on nutrient (nitrate and phosphate) levels, were determined using standard protocols. Catch-per-Unit Effort (CPUE) of gillnets in sites with crocodiles was compared with corresponding control sites without crocodiles. CPUE was higher in areas inhabited by crocodiles, but appeared not to be directly influenced by nutrient levels. Increased fish catches in areas inhabited by crocodiles might be attributed to several factors, such as reduced fishing pressure due to the presence of crocodiles which discouraged the local fishermen to fish intensively. Overall, while fish catch was higher in areas inhabited by crocodiles, it is too early to attribute this to the nutrient output from crocodiles due to several confounding factors. **(Author's abstract)**

Keywords: *Estuarine, Fish catch, Freshwater, Nutrient, Biology*

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NP

0099

Degradation of myosin heavy chain and its potential as a source of natural bioactive peptides in dry-cured ham

Mora, L. , Gallego, M. , Toldrá, F.

Myofibrillar proteins are extensively degraded by muscle endo- and exopeptidases during the ageing of meat and the processing of meat products. One of the most studied products is dry-cured ham. This degradation implies changes in the product in terms of texture (mainly due to calpains and cathepsins endopeptidases) and flavour (due to the action of exopeptidases) and defines its final quality. During the last decade, naturally generated peptides from the myofibrillar proteins titin, myosin light chain, troponin T, LIM domain-binding protein 3, and actin have been identified using peptidomic approaches, also showing the potential to act as bioactives in the human body when ingested. In this study, tandem mass spectrometry has been used for the identification of the peptides generated during the proteolysis of myosin heavy chain protein after 9 months of Spanish dry-cured ham processing. The size, sequence, and properties of some of the peptides showed their potential to act as bioactives. **(Author's abstract)**

Keywords: *Peptidomics, Dry-cured meat, Proteolysis, Myofibrillar proteins, Spanish dry-cured ham, Biology*

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2019,
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0100

Density of Associated Macrofauna of Black Corals (Anthozoa: Antipatharia) in Jagna, Bohol, Central Philippines

Suarez, Hyacinth N. , Dy, Danilo T. , Renante R. Violanda,

Black corals or antipatharians (Anthozoa: Antipatharia) are abundantly found in the waters (depths of 15-40 m) of Jagna, Bohol, Central Philippines. However, inaccessibility due to SCUBA depth limitation has discouraged researchers from documenting the ecological role of antipatharians in hosting associated macrofauna. The study, conducted in August-September 2013 and February 2014 at 15-40 m depth, compared the density of macrofauna between whip and branching black corals among different colony sizes, across six sampling sites and different depth ranges. Each colony size of black corals was determined by writing a script under LabVIEW. Of the forty colonies observed (eight branching and 32 whip types), 68% (or 27 colonies) hosted associated macrofauna.

Eighteen macrofauna taxa belonging to six phyla were identified: Porifera, Cnidaria (Anthozoa), Mollusca (Gastropoda and Bivalvia), Echinodermata (Crinoidea), Arthropoda (Cirripedia) and Chordata (Ascidiaceae and Actinopterygii). The average density of macrofauna ranged from 82 to 8,313 individuals/m², with counts ranging from 1 to 74 individuals. The crinoids were found to be the most abundant with 243 individuals and a density of 166 individuals/m². By generating data using Monte Carlo simulation and comparison by student t-test at 95%, p=0.05, a significant difference in the density of macrofauna between whip and branching black corals was found. However, there was no significant difference between density of macrofauna and sampling stations, depth, and colony size (Spearman R correlation and Kruskal-Wallis test; 95%, p=0.05). This lack of statistical difference suggests higher within group variance than between group variance. Black corals should be protected in the entire study site to promote biodiversity at depths and in areas not inhabited by scleractinian corals. **(Author's abstract)**

Keywords: *Biology, Biodiversity, Cnidarians, Crinoidea, LabVIEW, Marine conservation, MPA*

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0101

Designing of storage units and spider web collectors for *Pholcus phalangioides* for the mass production of spider silk

Ampunan, Danella Rose , Placer, Ma. Lorraine , Robles, Katrina , Manalo, Laureen , Olvido, Angelo

Spider silk has been a subject of interest among many researches due to its remarkable mechanical properties. However, existing methods for the extraction of spider silk can exhaust the silk production of spiders and it takes about a week for some spiders to recover lost silk. The purpose of this study is to design and construct storage units for *P. phalangioides* which allows the spiders to naturally spin their webs for collection. The storage units are composed of 25 units (five by five), painted black on the interior with proper ventilation and spider silk collectors for each of the units on the base. The spiders were properly fed and hydrated, and the collection of silk was done every five days. The percentages of produced spider silk and collected spider silk were obtained and were evaluated using arbitrary levels: from very low (0 percent) to very high (100 percent). A high production of spider silk with a mean average of 82.00 percent was obtained. The spider silk collectors with a very high efficiency value of 98.083 percent, collected a mean average of 80.25 percent of the total area covered by the silk. Additionally, there was no significant difference between experimental groups as determined by one-way ANOVA (p=0.121); it proves that every storage unit has equal chance of enabling the spider to yield high production of spider silk. The storage units were conducive environments for the spiders to spin their silk. Mimicking the natural habitat of spiders in order for them to yield high production of spider silk was achieved. (Author's abstract)

Keywords: *Spider silk, Pholcus phalangioides, Spider, Biology*

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***Dicranum ignatovii* sp. nova (Dicranaceae, Bryophyta) from the Far East**
Dugarova, Oyuna D. , Fedosov, Vladimir E. , Tubanova, Dol

The new species *Dicranum ignatovii* Tubanova & Fedosov is described from Sakhalin, South Kurile Islands and the Khabarovsk Territory based on the approach of integrative taxonomy. The species is characterized by the unique combination of (1) short leaves with broadly acute apex, (2) slightly recurved distal leaf lamina, (3) short-rectangular to transverse rectangular distal leaf cells, (4) proximal leaf cells abruptly shortened distally and thus occupying only the basalmost leaf portion, (5) costa ending before apex, and (6) presence of flagelliform branchlets in upper leaf axils. Based on nrITS 1, 2 & 5.8 rRNA gene sequences, molecular phylogenetic analysis was carried out. As a result, three studied specimens were found in a well supported clade, nested in a weakly supported clade where *D. acutifolium*, *D. caesium*, *D. bardunovii*, *D. angustum*, *D. bonjeanii*, *D. scoparium* and *D. brevifolium* were also found. (Author's abstract)

Keywords: *D. acutifolium*, *D. caesium*, *D. bardunovii*, *D. angustum*, *D. bonjeanii*, *D. scoparium*, *D. brevifolium*, *Dicranum ignatovii*, *Biology*

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 2018,
 (Filipiniana Analytics)
 NP

Differential roles of two DDX17 isoforms in the formation of membraneless organelles
Hirai, Yuya , Domae, Eisuke , Yoshikawa, Yoshihiro , Tomonaga, Keizo

The RNA helicase, DDX17 is a member of the DEAD-box protein family. DDX17 has two isoforms: p72 and p82. The p82 isoform has additional amino acid sequences called intrinsically disordered regions (IDRs), which are related to the formation of membraneless organelles (MLOs). Here, we reveal that p72 is mostly localized to the nucleoplasm, while p82 is localized to the nucleoplasm and nucleoli. Additionally, p82 exhibited slower intranuclear mobility than p72. Furthermore, the enzymatic mutants of both p72 and p82 accumulate into the stress granules. The enzymatic mutant of p82 abolishes nucleolar localization of p82. Our findings suggest the importance of IDRs and enzymatic activity of DEAD-box proteins in the intracellular distribution and formation of MLOs. (Author's abstract)

Keywords: *DDX17*, *Intrinsically disordered regions*, *Membraneless organelles*, *Nucleolus*, *Stress granules*, *Biology*

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Diversity of trees and structure of forest habitat types in Mt. Tago Range, Mindanao, Philippines

Tandang, Danilo N. , Galindon, John Michael M. , Lagunday, Noel E. , Coritico, Fulgent P., Amoroso, Victo

Mt. Tago Range in Bukidnon has been subjected to deforestation and forest fragmentation due to logging ca. 35–40 years ago or as direct result of land conversion for agriculture, human settlements and wildlife product harvesting. It is currently not a protected area. This study aimed to provide data on the tree species diversity, structure, composition, conservation status and threats of the forest habitats in the site. Tree survey in the range was conducted in 2018–2019 using thirty-nine 20 x 20 m sampling plots and six one-kilometer transect lines. A total of 1,032 tree individuals from 54 families, 85 genera and 121 species were documented. The site is composed of four tropical forest habitat types namely: lower montane rainforest, upper montane rainforest, mossy-pygmy and forest over ultramafic rocks. These forest habitats also differed in species composition, elevation, substrate, dominance and structure in terms of height and diameter at breast height. The highest diversity index was observed in the mid-elevation and decreasing toward the peak. The diversity pattern herein is attributed to elevation, forest degradation due to anthropogenic activities and nature of habitat. The most abundant families were the Myrtaceae (23%), Podocarpaceae (12.8%) and Fagaceae (12.6%). At the family level the most dominant taxa included the Moraceae (8.7%), Rubiaceae (6.5%) and Myrtaceae (5.8%). Highest importance value index (IVI) in all forest types fell within the range of IVI's for tropical forests. Assessment of conservation and ecological status revealed that 11 species (8%) are threatened, 28 (22%) Least Concern (LC) and 16 (12%) are Philippine endemics. Threats to tree diversity in Mt. Tago Range included land conversion for agriculture and settlement, illegal logging and lack of legislative protection. The implementation of conservation strategies by stakeholders is recommended to protect the tree species communities and population across the forest habitat types in the site. **(Author's abstract)**

Keywords: *Biodiversity, Flora, Shannon-Weiner Index, Importance Value Index, Non-Protected Area, Biology*

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NP

DNA barcode of the Lanzones scale insect, *Unaspis mabilis* Lit & Barbecho (Hemiptera: Diaspididae)

Latina, Romnick A. , Abenis, Kristine O. , Lucañas, Cristian C. , Lit, Jr., Ireneo L. , Alvarez, Vanessa Kate I., Caoili, Barbar

The mitochondrial *cytochrome c oxidase subunit I (COI)* nucleotide sequences of *Unaspis mabilis* Lit & Barbecho (Hemiptera: Diaspididae), are provided for the first time. The total genomic DNA of each scale insect was extracted from individuals infesting lanzones leaves from three selected sites in Los Baños, Laguna. A partial *COI* gene amplicon with approximately 750 bp was obtained using the primer pair PcoF1 and LepR1. Nucleotide sequence alignment showed no variation among the *COI* sequences from all the samples. BLASTn search yielded no significant match with any of the available sequences for *Unaspis* species. The closest hit was *Aulacaspis tubercularis* Newstead (GenBank Accession No. HM474091) with 87.4% nucleotide similarity. Nonetheless, phylogenetic analyses revealed that generated *COI* sequences from *U. mabilis* form a monophyletic clade with *U. yanonensis* and *U. euonymi*, with closer proximity to the former. These findings also strengthen the species status of *U. mabilis* under the genus *Unaspis*. The DNA barcodes generated from this study (GenBank Acc. Nos. MN114099, MN14101, and MN114102), could, therefore, be used to verify the species identity of other lanzones scale accessions, as well as monitor the distribution and spread of *U. mabilis*, which would greatly influence possible pest management options. **(Author's abstract)**

Keywords: *Cytochrome C oxidase I, COI, Lansium domesticum Correa, Lanzones, Biology*

Echoes from the past – the identity of *Sundathelphusa picta* (von Martens, 1868) and descriptions of two new species of freshwater crab (Crustacea, Brachyura, Gecarcinucidae, *Sundathelphusa*) from Luzon Island, the Philippines
Ng, Peter K. L., Mendoza, Jose Christopher

The poorly known Philippine freshwater crab, *Sundathelphusa picta* (von Martens, 1868) from Luzon Island is re-described and re-illustrated, using type material as well as other specimens sampled from near its type locality. Two similar congeners from Luzon, *S. uva* sp. nov. and *S. angelito* sp. nov., from the provinces of Bataan and Rizal, respectively, are described as new. These three species are united by their relatively small size, rounded and dome-shaped carapaces, proportionately short ambulatory legs, and stout male first gonopods. They are distinguished from each other by a suite of morphological characters, particularly of the carapace, male pleon and gonopods. **(Author's abstract)**

Keywords: *Decapoda, Sundathelphusa uva, Sundathelphusa angelito, Taxonomy, Bataan, Bicol, Rizal, Biology*

eDNA from culture-independent Hirudinaria bpling Phillips 2012 (Annelida: Hirundinidae) as a tool for biodiversity assessment
Castillo, Josefino R. , Garcia, Ian Carlo P. , Calimag, Ma. Kersten A. , Dizon, Michaela Ma

Recent interest in the use of leeches as a source of eDNA by obtaining and analyzing traces of its last blood meal has proven noteworthy as a tool in screening biodiversity. As the method is fairly new and has relatively unexplored benefits, its assessment as a tool in such fields as ecology and biotechnology prompts further studies. This study was conducted to provide an alternative to collecting samples in poorly-explored areas or in areas where collection is very difficult, if not impossible. Using leeches collected from Angadanan, Isabela, DNA was extracted and cytochrome oxidase I (COI) gene was amplified using conventional PCR. Gene sequences from resulting amplicons were matched with similar sequences using BLASTn, where prey sequences were narrowed down to organisms with the highest match of no less than 85%. Highest score of similarities were obtained and species identified included *Cyprinus carpio* L., 1758, *Homo sapiens* L., 1758, *Bos taurus* L., 1758, *Bubalus bubalis carabanensis* L.S. Castillo, 1998, *Equus caballus* L., 1758, and *Canis familiaris* L., 1758. These results demonstrate that using leech-extracted blood meal may be a successful tool in screening vertebrate biodiversity. **(Author's abstract)**

Keywords: *DNA analysis, Biodiversity, Leech, Second-generation sequencing, Biology*

Effect of mycorrhizal inoculation on growth, nutrient status, and rhizosphere microbes of *Acacia mangium* and *Eucalyptus urophylla*
Victoria, Kristel S.

Acacia mangium and *Eucalyptus urophylla* are popular species for forest plantation and known for their rehabilitation capability on heavy metal sites. The experiment was conducted to determine the effect of soil inoculants such as arbuscular mycorrhizal fungi (AMF) and nitrogen-fixing bacteria (NFB) on growth, nutrient accumulation, and microbial population of both species under field conditions. The NFB inoculant with *Azospirillum* was produced at BIOTECH UPLB. The seedlings inoculated with AMF from Surigao, Mindanao mine tailing (coded as Sur) with or without NFB were raised at the screenhouse and planted in mine tailing site of Mogpog, Marinduque. After 27 mo, the highest height increment (202.5 cm) was noticed on *A. mangium* (126 cm) and on *E. urophylla* under Sur inoculation alone. The highest stem diameter increment of *A. mangium* (54.7 cm) was observed in Sur+NFB while for *E. urophylla* (29.9 cm) it was observed in Sur alone. Shoot and root dry weights of both species were highest in Sur. Total N uptake of both plants and P uptake of *E. urophylla* was highest in Sur inoculant while the P in *A. mangium* was highest in Sur+NFB treatment. Sur+NFB inoculated plants gave the highest population of NFB with highly significant effect in *A. mangium* while Sur alone accumulated the highest NFB in *E. urophylla* but with no significant effect on Sur+NFB and control counterpart. Mycorrhizal spore count of both plants were highest in Sur, while the highest percent root colonization in *A. mangium* was observed with Sur inoculation and with Sur+NFB inoculation in *E. urophylla*. Correlation analysis among growth, nutrient, and microbial parameters were also obtained. Root colonization and spore count in *A. mangium* were highly correlated. On the other hand, a high correlation between plant dry weight and root dry weight was obtained in *E. urophylla*. The response of both species to mycorrhizal inoculation provides a useful criterion in selecting plant species that can be used in revegetation of mined-out areas and other degraded lands throughout the country.

Keywords: biofertilizer, microbial population, mined-out area, nitrogen-fixing bacteria, root infection, *Acacia mangium*, *Eucalyptus urophylla*, arbuscular mycorrhizal fungi, Biology

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2019,
(Filipiniana Analytics)

The Effect of Plant Spacing on the Voltage Performance of a Shared-Anolyte Plant Microbial Fuel Cell Utilizing *Ipomoea aquatica*
Antonano, Hezekiah, Maniba, Vinze Dexler, Montinola, Tiffany Rose, Salvador, Erika Eunice

Plant Microbial Fuel Cells (P-MFCs) are bio-electrical chemical devices that utilize bacteria in plant rhizodeposits to generate electricity. In order to determine the effect of plant spacing on the voltage output of P-MFCs, shared-anolyte P-MFC system utilizing *I. aquatica* were designed and constructed. A single shared-anolyte P-MFC contains three P-MFCs connected in series, with all three plants in the same soil. They were three shared-anolyte P-MFC set-ups, with each setup having a triplicate. The plant spacing of the setups were 5, 7, and 9 cm respectively. According to the results, shared-anolyte P-MFCs with shorter plant spacing produced a greater voltage output. This shows that P-MFCs can be a potential candidate for future power generation, because shorter plant spacing is needed, which means that the space they will take up will be lesser as well. The actual voltage output of the shared-anolyte P-MFCs is only 20.8%, 19.6%, and 20.9% for the 5, 7, and 9 cm plant spacing setups respectively. (Author's abstract)

Keywords: Microbial Fuel Cell, Anolyte Plant, *I. aquatica*, Biology

0110

**Effect of salt concentration on quality of Chinese northeast sauerkraut fermented by
Leuconostoc mesenteroides and *Lactobacillus plantarum***

*Yanga, Xiaozhe , Hu, Wenzhong , Jiang, Aili , Xiu, Zhilong , Ji, Yaru , Guan, Yuge , Sarengaowa, Yang,
Xiangyan*

Sauerkraut is one of the most popular traditional fermented foods in northeastern China. The traditional northeast sauerkraut is mainly based on natural fermentation at a certain salt concentration. Salt concentration has important effects on the microbial structure, the dynamic changes of metabolites and sensory quality of sauerkraut. To study the effects of different salt concentrations on the fermentation of northeast sauerkraut, *Leuconostoc mesenteroides* ORC 2 and *Lactobacillus plantarum* HBUAS 51041 were used as starter strains and fermented at four salt concentrations (0.5, 1.5, 2.5, 3.5%), respectively. Changes of pH, titratable acid (TA), nitrite, amino acid nitrogen (AAN), reducing sugar, microbial counts (lactic acid bacteria, yeasts, total coliforms), metabolites (organic acids, alcohols and sugars) and sensory were studied, which showed that 0.5% salt concentration had positive effects on the microbial metabolism and sensory quality of sauerkraut. Compared with other three salt concentrations, the glucose and fructose of 0.5% group were metabolized more fully to accumulate significantly ($p < 0.05$) more organic acids. In conclusion, 0.5% salt significantly accelerated the maturation and improved the sensory quality of sauerkraut. The sensory quality of northeast sauerkraut fermented at 0.5% salt concentration was the best. (Author's abstract)

Keywords: *Northeast sauerkraut, Salt concentration, Fermentation, Leuconostoc mesenteroides, ORC 2, Lactobacillus plantarum HBUAS 51041, Biology*

0111

**Effectiveness of multiple inoculation of biofertilizer with biochar on growth of cacao
(*Theobroma cacao* L.) seedlings planted under agroforest ecosystem**

Aggangan, Nelly S.

The study aimed to determine the efficacy of bamboo biochar (BB)-biofertilizer-vermicompost mix in promoting plant growth and yield of cacao seedlings under field conditions. The treatments were: Control, BioNTM, endoROOTS® (eR), MYKOVAM®(MV), MYKORICH®(MR), MV+eR, MR+eR, eR+BioNTM, MV+BioNTM, MR+BioNTM, MV+eR+BioNTM, and MR+eR+BioNTM. The experiment was conducted at Barangay Mabacan, Calauan, Laguna in July 2016 following a two factor Randomized Complete Block Design (RCBD). The highest height and stem diameter increments were obtained from MR inoculated seedlings after one year with a high significant effect to the control. Cacao inoculated with MV+eR promoted the highest fresh pod (940 g and 1177 g) and bean (221 g and 249 g) inoculated both with 0% and 15% BB, respectively. On the other hand, seedlings applied with 15% BB promoted a higher population of NFB compared to seedlings without biochar. The results imply that the significant effects of these inoculants could have potential applications for improvement to other agricultural ecosystem with similar conditions.

Keywords: agricultural ecosystem, cacao, *Theobroma cacao* L., nitrogen-fixing bacteria, biofertilizer, biochar, microbial inoculation, Philippines, Biology

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0112

Effects of macroalgal morphology on marine epifaunal diversity

Gan, Su Xuan , Tay, Ywee Chieh , Huang, Danwei

Macroalgae play important ecological roles, including as hosts for a wide range of epifauna. However, the diversity relationships between macroalgae and epifauna are poorly understood for most tropical host species and algal morphologies. This study aims to characterize and analyse the diversity of invertebrates present amongst macroalgae with three distinct morphologies (three-dimensional, filamentous and foliose) across different tropical intertidal sites in Singapore. Morphological and DNA barcoding tools were employed for epifaunal species identification, and ordination statistics and multiple linear regression were used to test the effects of algal morphology, species and site on community structure and diversity of epiphytic invertebrates. Overall, epifaunal communities were distinct among sites and algal morphologies, and diversity was affected significantly by algal morphology. In particular, filamentous macroalgae hosted the highest abundance of epifauna dominated mainly by amphipods, which were able to take advantage of the high surface area to volume ratio in filamentous algal mats as a consequence of their thinner forms. Foliose species showed a significantly negative effect on invertebrate diversity. Our findings highlight the diverse associations between intertidal macroalgae and invertebrates with high turnover between algal morphology and sites that contribute to the high biodiversity of tropical shores. Future studies should consider the effects of the host habitat, seasonality and more algal species on epifaunal diversity.
(Author's abstract)

Keywords: Algal morphology, Biodiversity, Community structure, DNA barcoding, Epifauna, Intertidal, South-east Asia, Tropical shores, Biology

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0113

Effects of Mycorrhizal Fungi and Bamboo Biochar on the Rhizosphere Bacterial Population and Nutrient Uptake of Cacao (*Theobroma cacao* L.) Seedlings

Aggangan, Nelly S. , Cortes, Angelbert D. , Opulencia, Rina B. , Jomao-as, Joshua G. , Yecyec, Romualdo P.

Arbuscular mycorrhizal fungi (AMF) and biochar applications have been found to enhance the nutrient cycling and agricultural crop production. This greenhouse study investigated the effects of AMF inoculation and biochar amendment at different level on the soil bacterial population, mycorrhizal root infection and nutrient uptake of cacao seedlings. Germinated two-week old cacao (*Theobroma cacao* L.) seedlings were either uninoculated or inoculated with AMF during transfer from seed germination boxes into individual polybags filled with acidic red soil amended with increasing (3.75%, 7.5% and 15%) level of bamboo biochar (BB). After 15 months, AMF inoculation improved the N and P uptake of cacao seedlings by 65% and 90% over the control, respectively. Highest (25 mg plant⁻¹) N uptake of the seedlings was observed in AMF+15% BB. P uptake of cacao seedlings was also improved by 7.5% BB (1.56 mg plant⁻¹), 15% BB (1.90 mg plant⁻¹) and AMF + 15% BB (1.89 mg plant⁻¹).

¹). Biochar levels improved the percentage root infection in mycorrhizal (+AMF) seedlings from 79% to 83%. The population of nitrogen-fixing bacteria (NFB) and phosphate solubilizing bacteria (PSB) increased with biochar amendment, consistently at 15% level. Irrespective with biochar amendment, AMF only affected the PSB population. Moreover, PSB population has strong correlation with the P and N uptake of cacao seedlings while NFB population was significantly correlated only with P uptake. The bacterial population and nutrient uptake were not significantly correlated with the percentage mycorrhizal root infection. The significant effect of these treatments indicates a good effect in improving the growth performance of cacao seedlings. **(Author's abstract)**

Keywords: *Acidic red soil, Arbuscular mycorrhizal fungi, Bamboo biochar, Nitrogen fixing bacteria, N and P uptake, Phosphate solubilizing bacteria, Biology*

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0114

Effects of Reduced pH on Larval Settlement and Survival of the Donkey's Ear Abalone, *Haliotis asinina* (Linnaeus 1758) *Tahil, Abduraji S. , Dy, Danila T.*

The potential effects of reduced pH as a result of an increased CO₂ concentration on settlement and survival of *Haliotis asinina* larvae were investigated. The settlement frequency (%F) was significantly different with respect to pH levels. On day 5, 100% of the settlement plates contained postlarvae at ambient conditions (pH 7.98) and pH 7.76. Lower %F was obtained at pH 7.41 (12.5% - 37.5%) and pH 7.57 (25% - 62.5%). Hence, significantly higher number of larvae attached to plates at ambient conditions (16 postlarvae plate-1) and at pH 7.76 (10 postlarvae plate-1). On the other hand, the concentration of carbonate ion was lowest in the high-CO₂ or reduced pH treatment and the larval settlement was also lower. Fewer larvae settled on plates exposed to pH 7.41 (3 postlarvae plate-1) and pH 7.57 (5 postlarvae plate-1). Post settlement survival (10 and 15 days after exposure) was significantly lower at reduced pH levels compared to ambient conditions. Settlement rate was also affected by the reduction in % cover of crustose coralline algae (CCA) of the plates and delayed morphological development of larvae at reduced pH. This study confirmed that reduction in pH of seawater to the levels predicted by the end of this century will have negative effect on the settlement and survival of *H. asinina* larvae, and by extension, the future economy of the abalone industry of the Philippines. **(Author's abstract)**

Keywords: *Abalone seed production, Larval abundance, Ocean acidification, pH, Settlement success, Biology*

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2015 June,
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Fil (S) Q1 P55 144/1 2015

0115

Endangered by trade: seizure analysis of the critically endangered Philippine Forest Turtle *Siebenrockiella leytensis* from 2004–2018 *Lim, Theresa Mundita S. , Diesmos, Arvin C. , Diesmos, Mae Lowe L. , Schoppe, Sabine , Sy, Emer*

The Philippine or Palawan Forest Turtle *Siebenrockiella leytensis* is the only endemic turtle known to occur in the Philippines. It was assessed as Critically Endangered in 2000 and has been considered as one of the world's top 25 most endangered turtles since 2003. The species is accorded protection nationally by the Wildlife Protection and Conservation Act of 2001 and its international commercial trade is regulated by the Convention on

International Trade in Endangered Species (CITES). However, the publication of its rediscovery in 2004 triggered unrelenting poaching and trafficking for the pet trade nationally and internationally. With the aim of quantifying the extent of poaching and to provide insight on the trade dynamics, we analyzed seizure records from 2004–2018 and conducted physical and online market surveys in 2017–2018. Twenty-three (23) seizure incidents involving 4,723 Philippine Forest Turtles were recorded in the last 15 years. Based on an online survey, we estimated that an additional 1,200 Philippine Forest Turtles were smuggled and illegally sold in China in 2015. The majority of the 74 live individuals exported legally from the Philippines were likely sourced illegally from the wild and declared fraudulently as captive bred by exporters to obtain CITES permits. While habitat loss or degradation is a major threat, the illegal pet trade remains the most important factor threatening the survival of the Philippine Forest Turtles in the wild. **(Author's abstract)**

Keywords: *Chelonian, CITES, Pet trade, Trafficking, Wildlife laundering, Biology*

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NP

0116

Establishment of Core Short Tandem Repeat (STR) Markers for Rice (*Oryza sativa* L.) Varietal Identification

Dalusong, Verna G. , Santos, Lorna H. , Perez, Loida M.

The genetic identity of rice cultivars is important to acquire plant variety protection and breeders' right. DNA-based cultivar identification can help to establish the varietal genetic identity of rice based on unique DNA profile. Short Tandem Repeat (STR) marker selection and validation were conducted following the recommendations of the Scientific Working Group in DNA Analysis Method (SWGAM) in establishing the STR markers for rice varietal identification. Forty-one STR markers were selected based on its polymorphism, sensitivity, stability, and species specificity. Polymorphism Information Content (PIC) values of the markers range 0.1889 to 0.7568 and detected an average number of 3.4 alleles per marker indicating high level of polymorphism. Genetic diversity index was 0.9609 indicating high level of genetic variation detected among rice cultivars used. Sensitivity test showed that the DNA concentration optimum for PCR analysis was 10.0 ng. Stability test showed that STR markers were able to amplify degraded DNA samples. Species specificity test revealed that STR markers generated PCR amplifications in both target (*Oryza sativa* L.) and non-target DNA sources including wild rice species, weeds, corn, rats, and human. This paper discusses details of STR marker selection for rice identification following SWGDAM parameters for DNA analysis . **(Author's abstract)**

Keywords: *Plant variety protection, STR DNA markers, SWGDAM, Biology*

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Evaluation of Sequence Related Amplified Polymorphic Markers for Genetic Characterization of *Mentha* Species

Malik, Rafia Hameed , Khan, Abdul Rehman , Aslam, Kashif , Shabir, Ghulam , Shah, Shahid Masood , Nazir, Abdul

The present investigation was carried out to find the genetic characterization of mentha species via Sequence-Related Amplified Polymorphism markers. Four mentha species, *Mentha spicata*, *M. piperata*, *M. arvensis* and *M. longifolia*, were investigated by a total of 21 combinations of SRAP markers. The average major allele frequency was 0.523 with a range of 0.25 to 0.75. The allele number ranged 2 to 4 with an average of 2.857. The least two number of alleles was observed in 4 different combinations while only one set of primers resulted in highest allele number. The average polymorphic information content was 0.517 with a minimum value of 0.304 and maximum value of 0.703. The UPGMA, based on Nei coefficient, clustered the four *Mentha* species into three. *M. spicata* and *M. piperata* showed a divergence from *M. arvensis* and *M. longifolia* and among themselves. The SRAP markers may thus represent an efficient marker for genetic characterization of *Mentha* species. These findings would help in diversity analysis of larger population of *Mentha* species using SRAP markers and on crop improvement. **(Author's abstract)**

Keywords: Diversity, *Mentha* species, SRAP, UPGMA, Biology

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Floral diversity assessment of the buffer zones and vicinity of the Mt. Hamiguitan Range Wildlife Sanctuary (MHRWS), Davao Oriental: basis for inclusion to protected area zone

Lagunday, Noel E. , Gorme, Felipe S. , Coritico, Fulgent P. , Acma, Florfe M. , Amoroso, Victor B., Salolog, Mary Cor S. , Colong, Rue

In 2016, municipal ordinances to expand the protected area of the MHRWS were issued with the aim of protecting and preserving the remaining biodiversity of the buffer zones and to strengthen the core zone. The municipal ordinances however, have limitations and do not guarantee legal promulgation. Hence, this study is on the gathering of complete and concrete floral data so that these expansion sites will become part of the protected area and encompassed in legal promulgations. Botanical fieldworks conducted from Oct to Dec 2017 were carried out in five study sites of the MHRWS expansion sites using 40 20 x 20 m sampling plot with a distance of 20 m between plots and opportunistic transect walk techniques. The study disclosed 228 taxa of plants, of these, 74 species were ferns and lycophytes, 6 species of gymnosperms, 30 species of herbs and vines and 118 species were trees and shrubs. There were three new records of ferns and lycophytes increasing the number of species to 155. There are 13 (5.7%) threatened species, 22 (9.6%) and endemic species. Findings suggest that species in each site are unique and maybe attributed to the vegetation present, elevation variations of the different sampling sites and anthropogenic activities. The proposed expansion sites harbor diverse threatened and plants deserving protection and conservation efforts. Results of this study support the contention that the expansion sites, which are included in the municipal ordinances, be part of the official protected area. **(Author's abstract)**

Keywords: Biodiversity, Mt. Hamiguitan Range Wildlife Sanctuary expansion sites, Mindanao, Philippines, Buffer zone, Biology

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Functional adaptations of *Begonia oxysperma* A. DC. and *Begonia ramosii* Merr. (Begoniaceae) revealed through morpho-anatomical analyses
Barrera, Jr., Wilfredo B., De Guzman, Viverly Joy D., Mergilla, Rose Mel

Populations of *Begonia* occur along the altitudinal gradients of Mt. Banahaw de Lucban. *Begonia ramosii* Merr. populations occur at lower altitudes and are gradually replaced by *Begonia oxysperma* A. DC. at higher elevations. This suggests the possibility of local adaptations and phenotype localization. Populations of *Begonia* were assessed and examined for phenotypic variability to provide information about habitat-driven traits and functional adaptations. Analysis of functional traits in 19 populations of *B. oxysperma* and 8 populations of *B. ramosii* using morpho-anatomical techniques confirmed these hypotheses. Phenolic vacuolar inclusions, anthocyanin pigmentation in young leaves and stems, presence of medullary vascular bundles and secondary growth, chlorophyll a concentration, trichome density in vegetative parts and stomatal density were observed to vary either intraspecifically or interspecifically which suggest functional adaptation. These preliminary results provide an interesting avenue for plant evolutionary and ecological studies using *Begonia* as a model plant species. (Author's abstract)

Keywords: *Adaptation, Environmental gradient, Habitat-driven traits, Mt. Banahaw, Variation, Biology*

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(Filipiniana Analytics)
NP

Galectin-lattice sustains function of cationic amino acid transporter and insulin secretion of pancreatic β cells
Maeda, Kento, Tasaki, Masayoshi, Ando, Yukio, Ohtsubo, Kazuaki

Maintenance of cell surface residency and function of glycoproteins by lectins are essential for regulating cellular functions. Galectins are β -galactoside-binding lectins and form a galectin-lattice, which regulates stability, clustering, membrane sub-domain localization and endocytosis of plasmalemmal glycoproteins. We have previously reported that galectin-2 (Gal-2) forms a complex with cationic amino acid transporter 3 (CAT3) in pancreatic β cells, although the biological significance of the molecular interaction between Gal-2 and CAT3 has not been elucidated. In this study, we demonstrated that the structure of N-glycan of CAT3 was either tetra- or tri-antennary branch structure carrying β -galactosides, which works as galectin-ligands. Indeed, CAT3 bound to Gal-2 using β -galactoside epitope. Moreover, the disruption of the glycan-mediated bindings between galectins and CAT3 significantly reduced cell surface expression levels of CAT3. The reduced cell surface residency of CAT3 attenuated the cellular arginine uptake activities and subsequently reduced nitric oxide production, and thus impaired the arginine-stimulated insulin secretion of pancreatic β cells. These results indicate that galectin-lattice stabilizes CAT3 by preventing endocytosis to sustain the arginine-stimulated insulin secretion of pancreatic β cells. This provides a novel cell biological insight into the endocrinological mechanism of nutrition metabolism and homeostasis. (Author's abstract)

Keywords: *Glycoprotein, Lectin, Cationic amino acid transporter 3 (CAT3), Insulin secretion, Biology*

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Genetic diversity of *Ixora macrophylla* Bartl. and *Ixora auriculata* Elmer (Rubiaceae) inferred from nrDNA (ITS) and cpDNA (*trnL-f*) sequence data

Zamudio, Sarah Grace S. , Banag-Moran, Cecilia I. , Yap, Justinne R. , Legarda, Mary Elizabeth C. , Canlas, Carl Anton D. , Casipit, Raphael Pa

This study aims to assess the intraspecific genetic diversity of *Ixora macrophylla*, a widespread species of Philippine *Ixora* recorded from several islands of the Philippines, and *I. auriculata*, an endemic species that has yet to be included in molecular studies of the Philippine *Ixora*. The number of haplotypes, haplotype diversity, and nucleotide diversity of 19 *trnL-F* and 17 ITS sequences of *I. macrophylla*, as well as 4 *trnL-F* and 4 ITS sequences of *I. auriculata* were obtained using DNAsp 5.10.1 software, and pairwise distances were calculated using the nucleotide Kimura 2-parameter using MEGA 6.06. Two haplotypes of *trnL-F* and nine haplotypes of ITS were identified in six populations of *I. macrophylla*. One of the two haplotypes of *trnL-F* was unique to the Mindoro population. One of the nine haplotypes of ITS was common among seven individuals from four populations. Intraspecific pairwise distances ranged from 0 to 0.1% for *trnL-F* and 0 to 0.9% for ITS. Mantel test showed weak correlations between the genetic and geographic distances for both *trnL-F* ($r = -0.0380$) and ITS ($r = 0.0980$) sequences. For the genetic diversity of *I. auriculata*, two haplotypes of *trnL-F* and four haplotypes of ITS were identified, with intraspecific pairwise distances ranging from 0 to 0.1% in *trnL-F* and 0.3 to 3.5% in ITS. The results for genetic diversity may be used to better understand the population genetics of the Philippine *Ixora* and provide insights for conservation. (Author's abstract)

Keywords: *Haplotype, Nucleotide diversity, Pairwise distances, Phylogenetic analyses, Population genetics, Biology*

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(Filipiniana Analytics)
NP

Geometric Morphometric Analysis of *Channa striata* (Striped Snakehead) Populations from Laguna de Bay, Philippines Reveals Shape Differences in Relation to Water Quality

Torres, Shenna Ka

Channa striata, locally known as dalag, constitute a major aquaculture resource in Laguna de Bay. Owing to its popularity as a food source, threats such as overfishing may potentially place this species at risk. However, studies regarding its status within the lake is lacking. One way to address this gap is through population studies using geometric morphometrics. In this study, a total of 82 specimens were collected across three areas of the lake, namely, Binangonan, Calamba, and Tanay. These areas were assessed using secondary data for physicochemical parameters, which revealed significantly higher ammonium-nitrogen levels in Binangonan compared to the other areas. Geometric morphometrics was then used to determine whether shape variation existed among *C. striata* populations. Results showed that shape variation was greatest in the cranial region, with fish from Binangonan and Tanay having the greatest variation in shape. On the other hand, specimens from Calamba had the highest morphometric values. Lastly, these findings were then correlated with water quality data using Canonical Correlation Analysis. Results indicated that shape variation in the cranial region was correlated with differences in dissolved oxygen and pH content of the lake. The weight and length of fish were inversely correlated to the levels of ammonium-nitrogen and total dissolved solids, with specimens from Binangonan displaying a high sensitivity to ammonium-nitrogen.

Keywords: *dalag, freshwater fish, shape variation, Laguna Lake, physicochemical parameters, Biology*

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0123

From germ cells to neonates: the beginning of life and the KEAP1–NRF2 system

Matsumaru, Daisuke, Motohashi, Hozumi

The Kelch-like ECH-associated protein 1(KEAP1)–NF-E2-related factor 2 (NRF2) system is one of the most studied environmental stress response systems. In the presence of oxidative and electrophilic insults, the thiols of cysteine residues in KEAP1 are modified, and subsequently stabilized NRF2 activates its target genes that are involved in detoxification and cytoprotection. A myriad of recent studies has revealed the broad range of contributions of the KEAP1–NRF2 system to physiological and pathological processes. However, its functions during gametic and embryonic development are still open for investigation. Although oxidative stress is harmful for embryos, *Nrf2*^{-/-} mice do not show any apparent morphological abnormalities during development, probably because of the compensatory antioxidant functions of NF-E2-related factor 1 (NRF1). It can also be considered that the antioxidant system is essential for protecting germ cells during reproduction. The maturation processes of germ cells in both sexes are affected by *Nrf2* mutation. Hence, in this review, we focus on the stress response system related to reproduction and embryonic development through the functions of the KEAP1–NRF2 system.

(Author's abstract)

Keywords: *Development, Embryos, Neonates, Oxidative stress, Reproduction, Biology*

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0124

Green Synthesis of Silver Nanoparticles Using *Moringa oleifera* sp. (Malunggay) Seed Aqueous Extract and Its Antibacterial Activity

Dogeno, Kim Dale, Gamboa, Gian Francesco, Pefianco, Luis Alfonso, Aban, Athenes Joy, Larroder, Aris

Silver nanoparticles, in recent years have gained interest due to their applications in various fields, such as in medicine, as a result of its antibacterial properties. The synthesis of nanoparticles involves reduction and capping processes. The current processes, however, involve the use of toxic chemicals. A solution for this is the use of green synthesis, which is done through the utilization of biological components which acts as both a reducing and capping agent. The study used *M. oleifera* sp. seed extract to synthesize silver nanoparticles as they possess various biomolecules that make the process effective. Ultraviolet-Visible spectrophotometry was used to monitor the formation of the silver nanoparticles. The synthesized silver nanoparticles were viewed under a Transmission Electron Microscope and had a mean size of 12 nm and spherical shape. The silver nanoparticles also showed antibacterial activity against the *S. aureus* bacterial culture. The study concluded that silver nanoparticles can be synthesized using *M. oleifera* sp. seed extract. **(Author's abstract)**

Keywords: *Moringa oleifera* sp., Malunggay, Green Synthesis, *S. aureus*, Biology

Growth, nutrient uptake, and soil chemical properties text cacao seedlings using biochar or AMF grown in acidic soil
, Jomao-as, Joshua G.

This greenhouse study investigated the potential benefits of bamboo biochar (BB) and arbuscular mycorrhizal fungi (+AMF) applied individually or in combination to cacao seedlings. The commercially developed mycorrhizal fungi was provided by the National Institute of Molecular Biology and Biotechnology (BIOTECH), which contains 12 species belonging to 4 genera, Gigaspora, Glomus, Acalauspora and Entrophospora. Seedlings were grown in acidic (pH 4.3, H₂O) red soil amended with biochar (wt/wt) at 0 (control), 3.75, 7.5, and 15% and inoculated or uninoculated with the mycorrhizal fungi. The height, stem diameter, and dry weight of the roots, stems, and leaves of cacao significantly increased in mycorrhizal (+AMF) treatment after 6 mo. Regardless of biochar level, no effect in plant dry weight was observed. The combined addition of AMF + 15% BB synergistically improved the total biomass by 111% and nutrient (N and P) uptake compared to uninoculated cacao at 0% BB. The mycorrhizal fungi spore count from the rhizosphere and root infection in the cacao roots was generally improved by BB addition. Moreover, the chemical properties of the soil such as pH, available P, exchangeable K, and CEC were consistently improved by 15% BB. Thus, giving credence to a suggested practice of a combined treatment rather than individual application of the two soil amendments.

Keywords: *arbuscular mycorrhizal fungi, black carbon, infertile soil, N and P uptake, root infection, cacao seedlings, Theobroma cacao L., biochar, acidic soil, Biology*

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Herpetological postage stamps issued from the Philippines
Gee, Genevieve V.A. , Das, Ind

In this essay, we commemorate the zoological and herpetological contributions of Angel Chua Alcala, with a review of stamps and pictorial cancellations on herpetological themes from the Philippines. Between 1982 and 2017, a total of 79 such stamps, stamp sheetlets and undenominated tabs, depicting amphibians and reptiles have been officially issued by the postal administration of the country, all but one within its commemorative stamp releases. Species featured are those of ecotourism importance, in addition to threatened or endemic taxa, although stylized as well as non-local species too have featured on stamps produced by the country. **(Author's abstract)**

Keywords: *Philippines, Philately, Stamps, Postmarks, Amphibians, Reptiles, Biology*

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(Filipiniana Analytics)
NP

Hypo-Osmotic Swelling Test for Membrane Integrity Evaluation of Frozen-Thawed Water Buffalo (*Bubalus bubalis*, Linn.) Spermatozoa

Hufana-Duran, Danilda, Mallari, Rachele P., Suba, Devon P., Duran, Peregrino G., Abella, Evaristo A., Mamuad, Felomino V.

Studies were conducted to establish the standard procedure of hypo-osmotic swelling test for frozen-thawed water buffalo spermatozoa. Hypo-osmotic swelling test is used in assessing plasma membrane integrity of spermatozoa of human and other livestock species. Plasma membrane integrity is a requisite of a fertile sperm. Standardization of hypo-osmotic swelling solutions and methodologies has not yet been done for frozen-thawed water buffalo spermatozoa; thus, the objective of this study was to identify assay conditions specifically for water buffalo. The following studies were conducted: Effective exposure time (0, 15, 30, 45, 60, 75, 90, 105, and 120 min) and temperature (25°C or 37°C), examination of the best osmolality of solution (0, 50, 100, 150, 200, 250, and 300 mOsm), evaluation of sugar (fructose vs. sucrose) better for HOS solution, and assessment of the repeatability and consistency of the test. Results showed optimum sperm reaction at 150 mOsm at 60 min but no significant difference was observed to 15 to 60 min exposure at 37°C in 50 to 200 mOsm using either fructose or sucrose as hypo-osmotic swelling solutions. Using the optimum HOST treatment procedure using 150 mOsm fructose-sodium citrate solution at 37°C for 45 min, a coefficient of variation ranging from 0.05 to 0.09 among bulls was observed. Results demonstrated a standard hypo-osmotic swelling test procedure that is simple, accurate and consistent with good repeatability to predict the functional membrane integrity of buffalo spermatozoa. (Author's abstract)

Keywords: Biology, Buffalo, Fertility, HOST, Spermatozoa., Sperm membrane integrity, Semen

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Fil (S) Q1 P55 144/2 2015

Identification and Phylogenetic Analysis of Sulfate-reducing Bacteria Isolated from Toxic Element-contaminated Sediments in the Philippines

Abisado, Rhea G., Simbahan, Jessica F., Nomura, Nakao, Migo, Veronica P., Tecson-Mendoza, Evelyn Mae, Trinidad, Lorele C.

Hydrogen sulfide (H₂S) generated by sulfate-reducing bacteria (SRB) has been noted as a potential solution to eliminate toxic elements from highly impacted sites. SRB cultures obtained from toxic element-contaminated sites (Marilao-Meycauayan-Obando River System (MMORS), and Mogpog River) in the Philippines were identified by molecular methods. Sequencing of 16S rRNA gene using universal bacterial primers and conventional characterization showed the pure cultures to be *Desulfovibrio vulgaris*. Mixed cultures revealed the presence of unclassified bacteria and representatives of the Gammaproteobacteria, Deltaproteobacteria, and Bacteroidetes. Abundant uncultured and unclassified bacteria and some bacteria with sulfate-reducing physiology were detected from 16S rDNA amplified from community DNA obtained from toxic element-contaminated sites of MMORS and Mogpog River. Moreover, bacteria with sulfate-reducing physiology were found not limited to the Proteobacteria group. Phylogenetic analysis showed microorganisms from the two sites clustered into two major groups: bacteria belonging to known/established groups and bacteria which were unclassified. It is highly possible that some isolates from the mixed cultures represent new species of SRB, which are still unreported in literature. Thus, this study expands the current information about the microbial diversity present in toxic element-contaminated sites with emphasis on SRB. (Author's abstract)

Keywords: 16S rRNA gene, Bulacan, Marinduque, Sulfate-reducing bacteria, Toxic elements, Biology

Improving the catalytic efficiency of thermostable *Geobacillus stearothermophilus* xylanase XT6 by single-amino acid substitution

Azouz, Rasha A M, Hegazy, Usama M, Said, Mahmoud M, Bassuiny, Roqaya I, Salem, Ahmed M, Fahmy, Afaf S

Directed evolution using error-prone polymerase chain reaction was employed in the current study to enhance the catalytic efficiency of a thermostable *Geobacillus stearothermophilus* xylanase XT6 parent. High-throughput screening identified two variants with enhanced activity. Sequencing analysis revealed the presence of a single-amino acid substitution (P209L or V161L) in each variant. The maximum activity of mutant V161L and P209L was at 85°C and 70°C, respectively. Both mutants exhibited maximum activity at pH 7. The thermal and alkaline tolerance of mutant V161L only were markedly improved. The two mutants were more resistant to ethanol inhibition than the parent. Substrate specificity of the two mutants was shifted from beechwood xylan to birchwood xylan. The potential of the two mutants to hydrolyze rice straw and sugarcane bagasse increased. Both turnover number (kcat) and catalytic efficiency (kcat/kM) increased 12.2- and 5.7-folds for variant P209L and 13- and 6.5-folds for variant V161L, respectively, towards birchwood xylan. Based on the previously published crystal structure of extracellular *G. stearothermophilus* xylanase XT6, V161L and P209L mutation locate on β α -loops. Conformational changes of the respective loops could potentiate the loop swinging, product release and consequently result in enhancement of the catalytic performance. **(Author's abstract)**

Keywords: *Biotechnology, Enzyme, Genetic engineering, Lignocellulose, Structure-function relationship, Biology*

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***In vitro* and *in vivo* biological properties of pea pods (*Pisum sativum* L.)**

Mejri, Faiza, Khoud, Haifa Ben, Njim, Leila, Baati, Tarek, Selmi, Slimen, Martins, Alice, Serralheiro, Maria L.M., Rauter, Amelia P., Hosni, Karim

Pea pods, a food waste by-product, was studied for its chemical composition and evaluated for its *in vitro* antioxidant, protein denaturing and anti-acetylcholinesterase (anti-AChE) and *in vivo* antidiabetic, antihyperlipidemic and cytoprotective properties in alloxan-induced diabetic mice. The pea pods had 51% fiber, 28.2% carbohydrates, 14.2% crude protein, 4.5% lipids and 4.5% ash which consisted mainly of K, Mg, Ca, Na, Fe, Zn and Cu (in descending order). The fatty acid (FA) profile showed that linoleic, linolenic and palmitic acids were the main components. Although its lipids are highly oxidation susceptible, the lipid fraction showed good nutritional attributes as shown by its low atherogenic, thrombogenic and hypoholestolemic values. The pea pods methanol extract (PPE) showed very low antioxidant activity but it had a strong inhibitory effect on heat-induced BSA denaturation suggesting its possible anti-inflammatory effects. Oral administration of PPE to diabetic mice decreased serum glucose levels, alanine aminotransferase, aspartate aminotransferase, urea, creatinine, alkaline phosphatase and lactate dehydrogenase activities. It reduced lipid peroxidation, and H₂O₂ and SH contents, but it significantly ($p < 0.05$) increased the activities of antioxidant enzymes (CAT, GPX and SOD) in the liver, kidney and testis. Moreover, PPE effectively reduced serum triglycerides, cholesterol and LDL and restored the hepatic, renal and testicular FA profiles suggesting its promising anti-hyperlipidemic effect. Overall, PPE could

be useful to help manage diabetes and its associated hyperlipidemia, to reduce the risk of oxidative stress and to decrease liver, kidney and testis damage. **(Author's abstract)**

Keywords: *Pea pods, Pisum sativum L., Antidiabetic, Anti-hyperlipidemic, Phenolic compounds, Biology*

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0131

Influence of Bamboo and Sugarcane Bagasse Biochar and Mycorrhizal Fungi on Growth and Nutrient Status of Cacao (*Theobroma cacao* L.) in Acidic Soil

Aggangan, Nelly S. , Homao-as, Joshua G.

Combined biochar and arbuscular mycorrhizal fungi (AMF) is a new approach contributing to sustainable plant production and ecosystem restoration especially in acidic soil. This study aimed to determine the growth response of cacao planted in acidic soil amended with biochar from bamboo trimmings (BB) and sugarcane bagasse (BSB). Aseptically germinated cacao (UF18) seedlings were inoculated with AMF inoculant containing 12 species belonging to four genera: *Gigaspora*, *Glomus*, *Acaulospora*, and *Entrophospora* during pricking placed directly beneath the roots. The experiment was conducted inside a screenhouse following RCBD with 12 replicates. Height increment of AMF and non-AMF inoculated cacao seedlings grown in soil with BB and BSB were comparable while height of those grown in no biochar (No BC) soil were the shortest. Dry weight, spore density, nitrogen uptake and root infection were higher in AMF than the non-AMF counterpart when grown in BB amended soil. Phosphorous uptake of non-AMF cacao grown in No BC, with BB and BSB were comparable to each other. However, mycorrhizal cacao seedlings grown in soil with BB doubled phosphorus (P) uptake relative to those non-AMF grown in BB amended soil. Also, the soil chemical properties were also improved upon the application of both BB and BSB. In conclusion, the results show that the addition of BB and BSB without AMF boost the growth and development potential of cacao seedlings. However, with AMF inoculation, much better growth and development of cacao was observed. **(Author's abstract)**

Keywords: *Black carbon, Wastes bamboo industries, N and P uptake, Philippines, Biology*

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0132

Initial terrestrial vertebrate diversity assessment in upland Cavite, Philippines

Causaren, Rubie M. , Lagat, Rona

Cavite's remaining upland forest fragments are either remnants from commercial logging activities ca. 25-45 years ago or as a direct result of land conversions for agriculture or human settlements. These forest fragments are very significant because they represent areas where pockets of wildlife habitat still remain. The terrestrial vertebrates are often used to assess animal diversity because they are ideal biological indicators of environmental change and anthropogenic disturbances. The study aimed to determine terrestrial vertebrate diversity, conservation status, and identify major anthropogenic threats in these fragments. Terrestrial vertebrates were surveyed using a combination of strip-transect sampling, time-constrained searches, visual encounter survey (VES), and acoustic encounter survey (AES; for amphibians only), point counts, live trapping and mist netting from October 2014 to March 2016. Species richness and biodiversity estimation were computed using Shannon-Wiener Diversity Index,

linear regression, detection and probability modeling using PAST, and confidence limits for nestedness (0.05 α) using EpiTools. A total of 175 terrestrial vertebrates were documented and among the vertebrate groups, the birds had the highest observed diversity. Twenty-nine (19 birds, 3 mammals, 3 lizards, and 4 anurans) species are listed as threatened. Habitat loss and degradation due to the conversion of habitats to agricultural and/or residential areas remained to be the most prevalent threat in the remaining forested areas in upland Cavite. Baseline data generated shall be used in the different government biodiversity monitoring activities as the basis for impacts and mitigation and initial planning for the management and conservation of these remaining forest patches. (Author's abstract)

Keywords: *Amphibians, Reptiles, Mammals, Birds, Luzon Island, Modeling, Anthropogenic threats, Biology*

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2018,
(Filipiniana Analytics)
NP

0133

Isoform-dependent subcellular localization of LMTK1A and LMTK1B and their roles in axon outgrowth and spine formation

Wei, Ran , Sugiyama, Arika , Sato, Yuta , Nozumi, Motohiro , Nishino, Hironori , Takahashi, Miyuki , Saito, Taro , Ando, Kanae , Fukuda, Mitsunori , Tomomura, Mineko , Igarashi, Michihiro , Hisanaga, Shin-ichi

Lemur kinase 1 (LMTK1) is a membrane-bound Ser/Thr kinase that is expressed in neurons. There are two splicing variants of LMTK1 with different membrane binding modes, viz., cytosolic LMTK1A that binds to membranes through palmitoylation at the N-terminal cysteines and LMTK1B, an integral membrane protein with transmembrane sequences. We recently reported that LMTK1A regulates axon outgrowth and spine formation in neurons. However, data about LMTK1B are scarce. We analysed the expression and cellular localization of LMTK1B along with its role in axon and spine formation. We found that both LMTK1B and LMTK1A were expressed equally in the cerebral cortex and cerebellum of the mouse brain. Similar to LMTK1A, the wild type of LMTK1B was localized to Rab11-positive pericentrosomal compartment. The kinase negative (kn) mutant of LMTK1B was found to be associated with an increase in the tubular form of endoplasmic reticulum (ER), which was not the case with LMTK1A kn. Furthermore, unlike LMTK1A kn, LMTK1B kn did not stimulate the axon outgrowth and spine formation. These results suggest that while LMTK1A and LMTK1B share a common function in recycling endosomal trafficking at the pericentrosomal compartment, LMTK1B has an additional unique function in vesicle transport in the ER region. (Author's abstract)

Keywords: *Axon outgrowth, Endoplasmic reticulum, Endosome trafficking, LMTK1, Rab, Biology*

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0134

Isolation and determination of bacterial load in randomly selected restrooms in restaurant bars at Prime Square, F. Torres Street, Davao City

Nono, Benjo Romil B. , Golangan, Leslie L. , Allado, Fremae Joy D. , Catedrilla, Russefe M. , Dayaganon, Avee Joy B., Valente, Mary Doll

Bacteria can be found everywhere. Though most are relatively harmless, many microorganisms are harmful and can cause death. Bacteria can thrive in restrooms as moisture and organic wastes support their growth. Urinary tract and gastrointestinal infections are the most commonly encountered health problems acquired from restrooms.

Thus, this study attempted to determine the presence of bacteria in two randomly selected male and female restrooms in restaurant bars in Prime Square, F. Torres Street, Davao City. By swabbing, Gram staining and biochemical test methods, most of the isolated microorganisms were identified to be *Neisseria* species, followed by *Staphylococcus aureus*, *S. epidermidis*, *E. coli*, *Bacillus species.*, *Enterobacter*, *Klebsiella*, *Enterococcus*, *E. saprophyticus*, *Micrococcus* and *Salmonella*. Most of the bacteria isolated were normal flora known to cause opportunistic infections of urinary tract, skin and gastrointestinal tract, and some are serious pathogens. These results show that public restrooms lack proper maintenance and that users must practice personal hygiene after using public restrooms. **(Author's abstract)**

Keywords: *Medical laboratory science, Restaurant restrooms, Bacterial load, Bacterial identification, Philippines, Biology*

Optima, Volume No. 1 Issue No. 1, 92
2013,
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NP

0135

Isolation and identification of Nosocomial infection-causing bacteria in delivery room settings: Impact to quality of care to mothers and newborns

Odin, Stephanie , Talinting, Zandra Mae , Mosquera, Jother , Pagatpatan, Mary Antoinette , Ramos, Mary Joy , Asperga, Alyanna Ariene Marie , Gaspar, Charity Leene S., Wahab, Tatal

The objective of the study was to identify bacteria that cause nosocomial infection and other diseases in delivery rooms which may put the mother and the newborn at risk to infections. The identification of pathogenic bacteria was conducted in a hospital in Davao City. Six samples from a Kellypad were collected from three different duty shifts, and microbiological culture, microscopic examination, and biochemical tests were conducted. Results showed the presence of *Pseudomonas species*, *Serratia Marcescens* and *Enterobacter Cloacae*. The results of the study indicated that the delivery instruments used in sample collections were contaminated with pathogenic bacteria. Thus, the researchers recommend proper disinfections of the equipment used in the delivery room setting in order to regulate the spread of infection in the area. **(Author's abstract)**

Keywords: *Nursing, Nosocomial infection, Delivery room, Quality of care, Philippines, Biology*

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2013,
(Filipiniana Analytics)
NP

0136

Isolation and identification of oil-degrading and lead-bioaccumulating bacteria and their degree of degradation/bioaccumulation in Coaco harbor, Sasa, Davao City

Pascasio, Anthony B. , Gadayan, May Amor C. , De Leon, Vill Patrick M. , Desabelle, Rae Kristine E. , Barluado, Mary Jane G., Bacus, Elisa

Hydrocarbons like diesel oil and heavy metals like lead are known water pollutants posing serious damage to marine life. The potential use of microorganisms to remediate water environmental problems is considered a cost-effective large scale solution. Oil-degrading and lead-bioaccumulating bacteria may thrive in environments exposed to the mentioned pollutants. The study attempted to isolate and identify bacterial strain that can both degrade hydrocarbons and bioabsorb heavy metals. Water samples collected near ship refuelling site in Coaco harbor were inoculated onto Bushnell Haas Agar (BHA) and produced growth of five organisms with oil-degrading

potential. They were then isolated, subjected to biochemical tests, and identified to be *Escherichia sp.*, *Micrococcus sp.*, *Citrobacter amalonaticus*, *Enterobacter agglomerans*, *Citrobacter freundii*. They were then used to treat diesel oil-contaminated water, and the degree of oil degradation was determined by measuring the oil concentration in the treated samples through Liquid-Liquid Partition Gravimetric Method. Of the five isolates, *Citrobacter amalonaticus*, *Enterobacter agglomerans* and *Citrobacter freundii* have shown significant ability to degrade oil contaminants in test samples, with *Citrobacter freundii* exhibiting the highest capacity. The isolated oil-degrading organisms were then used to treat lead-contaminated water to determine their lead-bioaccumulating capacity, which was analyzed by determining the remaining lead concentration in the water media measured by Direct Air Acetylene Flame method. Results clearly indicated that the five bacterial isolates showed substantial ability to absorb soluble lead with *Citrobacter freundii* exhibiting the highest ability in lead absorption, showing significant difference ($p < 0.05$) as compared with the negative control and the rest of the isolates. Thus, the study successfully isolated and identified organisms with both oil-degrading and lead-bioabsorbing capabilities, with *Citrobacter freundii* isolate consistently exhibiting the highest ability, making it an excellent subject for use in future bioremediation studies. **(Author's abstract)**

Keywords: *Bioremediation, Oil-degrading, lead-bioaccumulating, Citrobacter freundii, Philippines, Biology*

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2013,
(Filipiniana Analytics)
NP

0137

Isolation of Helminth Eggs Using Gasoline as Ether Substitute in Formalin-Ether Concentration Technique

Zamora, Maria Rheena Flor C. , Suberon, Rhea F. , Landero, Rhubilyn L. , Cadiente, Erylle P. , Dayaganon, Avee

To diagnose pathologic conditions due to parasitosis, several procedures may be used in order to isolate fecal parasites. These include the simple Direct Fecal Smear (DFS) to the more complex fecal concentration techniques such as Formalin-Ether Concentration Technique (FECT). This study investigates the possibility of using the more readily available gasoline as substitute for ether, which is a highly volatile organic compound, in FECT. Two hundred positive clinical fecal parasitology specimens were pre-examined by DFS and Kato's technique. The specimens were subjected to FECT as standard vis a vis a modified technique that substituted ether with regular, special, and unleaded gasoline. Samples from both techniques were examined in parallel considering three criteria: viability in the parasitic recovery rate, sample macroscopic clarity rate, and microscopic clarity rate. Both the standard and the modified techniques gave identical results ($p > 0.05$) in terms of viability in the parasitic recovery rate and macroscopic clarity rate. However there is a significant difference ($p < 0.05$) in the microscopic clarity rate using ether, special gasoline and unleaded gasoline when compared to regular gasoline which yielded lower microscopic clarity results. These results indicate that special and unleaded gasoline may be used as a substitute to ether in the isolation of fecal parasites using FECT. **(Author's abstract)**

Keywords: *Medical Laboratory Science, Elminth eggs, Formalin-Ether Concentration Technique (FECT), Gasoline, Direct Fecal Smear (DFS), Kato Technique, Philippines, Biology*

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2013,
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NP

A k-Parameter Analysis of Hardy-Weinberg Equilibrium Conditions for the Mangrove Species in Two Islets of Eastern Visayas, Philippines

Ontoy, Dexter S. , Picardal, Jay P. , Padua, Roberto N., Tecson, Sherl

The Hardy-Weinberg Equilibrium model was used as a platform for analyzing a field survey data on the distribution of mangrove species in two islets of Eastern Visayas, Tabuk and Cabgan. The study is part of a larger Island Biodiversity program of the Cebu Normal University. A new estimator, developed by the first author, for measuring deviations from equilibrium was used in the study, while the relationship between the classical Shannon's diversity index and the Hardy-Weinberg equilibrium was likewise explored. Results revealed that the probability of extinction of the mangrove species in both islands are relatively high and the most probable future configuration of these species, apart from a total extinction scenario, is either a single-species or a two-species configuration. The protection of the Tabuk islet yielded positive benefits for the diversity of the mangrove species, while a reforestation project for the two islands served to reduce heterogeneity *viz.* reduce diversity, because only one or two species of mangroves were planted in the early part of 2000. (Author's abstract)

Keywords: *Multinomial distribution, Diversity index, Hardy-Weinberg Equilibrium, Biology*

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2011,
(Filipiniana Analytics)
NP

Kombucha fermentation of African mustard (*Brassica tournefortii*) leaves: Chemical composition and bioactivity

Rahmani, Rami , Beaufort, Sandra , Villarreal-Soto, Silvia Alejandra , Taillandier, Patricia , Bouajila, Jalloul , Debouba, Mohamed

Brassica tournefortii is an edible vegetable formerly consumed by North African populations. Nowadays, this plant has been neglected and is less used. The present study aims to give an extra nutraceutical value to *B. tournefortii* using a 2-wk kombucha fermentation process. At the end of incubation, fermented and unfermented (control) *B. tournefortii* aqueous extracts were successively fractionated with ethyl acetate (EtOAc) and n-butanol to measure their chemical composition and bioactivity. Results showed that kombucha fermentation significantly increased total phenolic content, with the highest amounts in the EtOAc fraction. The antioxidant potential of *B. tournefortii* leaves was improved by fermentation of EtOAc extracts and conversely lowered in aqueous ones. Anti-acetylcholinesterase activity was increased with fermentation to reach ~8-fold higher value in *B. tournefortii* EtOAc and aqueous extracts relative to unfermented samples. Kombucha fermentation was found to reduce cytotoxicity and xanthine oxidase inhibitory effects of *B. tournefortii* leaves. The findings suggested that fermentation is a promising, simple and safe bioprocess that could improve the food properties of less-used edible plants. (Author's abstract)

Keywords: *Brassica tournefortii, African mustard, Kombucha, Tea fungus, Biology*

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2019,
(Filipiniana Analytics)
F(S) TP248.65.F66 F66 n.30 201

Larval Mosquito Fauna (Diptera: Culicidae) of Salikneta Farm, San Jose Del Monte, Bulacan, Philippines

Almarineza, Billy Joel M. , Claveria, Florencia G.

A survey of the mosquito fauna occurring in Salikneta Farm, San Jose Del Monte, Bulacan, Philippines was conducted with the primary aim of providing baseline data that may help in coming up with strategies for short-term and long-term vector control. Six species were identified by examination of larval morphology and chaetotaxy, and are reported herein. 340 (62.27%) *Culex quinquefasciatus*, 50 (9.16%) *Cx. mimeticus*, 28 (5.13%) *Cx. vishnui*, 8 (1.47%) *Cx. tritaeniorhynchus*, 111 (20.33%) *Aedes aegypti*, and 9 (1.65%) *Anopheles tessellatus* comprised the 546 third and fourth instar mosquito larvae collected from improvised ovitraps placed in five selected sites in the farm. With the exception of *Cx. mimeticus*, the species identified in the farm are recognized as medically important taxa with the potential to transmit agents of arboviral and/or parasitic diseases. These findings imply the importance of proper and sustainable vector control measures in Salikneta Farm where human activities and habitation have been gradually increasing as a consequence of ongoing development. **(Author's abstract)**

Keywords: *Aedes, Anopheles, Culex, Identification key, Larval morphology and chaetotaxy, Vector surveillance, Biology*

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2015 June,
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Fil (S) Q1 P55 144/1 2015

Latundan banana *Musa sapientum* as nutrient source in microbial culture media

Bano, Gharen , Insoy, Iris , Baquiran, Leslie , Ago, Lhinnie Pearl , Barluado, Mary J

The use of culture media is necessary in growing microorganisms for the diagnosis of diseases, in research, and in many microbiological laboratory work. The study investigated the potential of Latundan banana *Musa sapientum* as sole nutrient source for microbial culture media. Banana powder was prepared from ripe and unripe banana fruit, and subjected to biochemical and chemical tests. Results revealed high amounts of carbohydrates, minerals (potassium, nitrogen, phosphorus, magnesium, calcium, and iron), and crude protein – all required for microbial growth. Solid media with different amounts of the banana powder were then formulated, and their capacity to sustain microbial growth for 24, 48 and 72 hours was tested using nutrient agar as positive control, and pure cultures of the bacteria *Staphylococcus aureus* and *Pseudomonas aeruginosa* and the fungus *Aspergillus niger* as test organisms. All banana media consistently sustained microbial growth, with the unripe fruit (16g/L) exhibiting the best growth in 72-hr period, which was comparable (no significant difference, $p > 0.01$) to the growth of the same microorganisms on nutrient agar as positive control. Hence, unripe Latundan banana fruit may potentially be formulated as powder and commercialised as an alternative to nutrient agar in preparing microbial culture media. **(Author's abstract)**

Keywords: *Medical laboratory science, Latundan banana Musa sapientum, Culture media, Nutrient source, Nutrient agar, Philippines, Biology*

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NP

High Lipid and Protein-Producing Epilithic Microalga, *Desmodesmus* sp. (U-AU2): A Promising Alternative Feedstock for Biodiesel and Animal Feed Production

Arguelles, Eldrin DLR. , Laurena, Antonio C. , Monsalud, Rosario G. , Martinez-Goss, Milagrosa R.

Microalgae are considered nowadays as a potential alternative feedstock for biodiesel and animal feed production since these organisms are known to possess high amounts of lipids, proteins, and other bioproducts. This study examines the possibility of using a green microalga, *Desmodesmus* sp. (U-AU2) for animal feed and biodiesel production by doing proximate analysis of the algal biomass and evaluation of fatty acid profile from biodiesel obtained from transesterified microalgal oil. Comparative analysis of the effect of different concentrations of nitrogen source (0.375-1.50 g L⁻¹ NaNO₃) on growth behavior, oil yield and fatty acid profile composition of the microalgal strain was investigated. After 22 d of cultivation, highest lipid accumulations for the alga was observed in culture growth condition with 0.375 g L⁻¹ NaNO₃, which is only a quarter of the original nitrogen source concentration. Maximum average biomass yield (under nitrogen-starved condition) of *Desmodesmus* sp. (U-AU2) is 0.675 g L⁻¹ with 27.23% lipid content per dry weight of biomass. It was observed that as the concentration of sodium nitrate in the medium decreased, algal biomass production also decreased but the lipid content increased. Fatty acid methyl ester (FAME) profiling of the biodiesel obtained contain a total saturated and monounsaturated fatty acid methyl esters of 61.11%. The physico-chemical properties were calculated using empirical equations and were found to be with in the recommended biodiesel standard specifications of EN 14214 (European) and ASTM 06751 (American). Proximate analysis of the dried microalgal biomass showed that *Desmodesmus* sp. (U-AU2) contains high protein content of 49.95±0.02%. Hence, *Desmodesmus* sp. (U-AU2) is a suitable candidate feedstock for the production of excellent quality biodiesel while its protein rich biomass can be used for animal feed. **(Author's abstract)**

Keywords: *Algal biomass, Fatty acid methyl esters, Nitrogen starvation, Proximate analysis, Biology*

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The 'mitochondrial contact site and cristae organising system' (MICOS) in health and human disease

Eramo, Matthew J. , Lisnyak, Valerie , Formosa, Luke E. , Ryan, Michael T.

The 'mitochondrial contact site and cristae organising system' (MICOS) is an essential protein complex that promotes the formation, maintenance and stability of mitochondrial cristae. As such, loss of core MICOS components disrupts cristae structure and impairs mitochondrial function. Aberrant mitochondrial cristae morphology and diminished mitochondrial function is a pathological hallmark observed across many human diseases such as neurodegenerative conditions, obesity and diabetes mellitus, cardiomyopathy, and in muscular dystrophies and myopathies. While mitochondrial abnormalities are often an associated secondary effect to the pathological disease process, a direct role for the MICOS in health and human disease is emerging. This review describes the role of MICOS in the maintenance of mitochondrial architecture and summarizes both the direct and associated roles of the MICOS in human disease. **(Author's abstract)**

Keywords: *Cristae, Membrane organization, MICOS, Mitochondria, Biology*

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2020 March,
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Marine macrophyte composition during summer, southwest and northeast monsoons in Verde Island, Batangas City, Batangas, Philippines

Persia, Alocs, Tabuga, Alvin, Arcega, John Matthew, Rula, Najeen Arabelle M., Ablaña Saco, Jayvee, Alub, Mark Ant

Verde Island Passage is the world's center of the center of marine shore fish biodiversity, located in southwestern Luzon Island in the Philippines. The passage is named after Verde Island, which is located at its middle. Although the island is located within a key biodiversity area, studies on its marine macrophyte biodiversity are scant. The present study was conducted to determine the composition, distribution, and dominance of marine macrophytes, specifically seaweeds and seagrass, during the northeast monsoon, summer, and southwest monsoon in four coastal areas in Verde Island using the line transect-quadrat method. Results revealed 63 macrophyte species, of which 92% were seaweeds and 8% were seagrass. The majority of the seaweeds were green (41%), followed by red (35%) and brown (16%) seaweeds. In most sites, the brown seaweed *Padina* sp. was dominant during summer and cover decreased during both monsoons. The green seaweed *Neomeris annulata* was present in all sites and seasons. The differences in cover across sites may be due to substratum type and topography where a relatively wider intertidal zone with different substratum such as rocky and sandy to muddy provides complex habitat promoting higher macrophyte cover. Temporal differences in marine macrophyte composition were more pronounced in macroalgae-dominated sites than in the seagrass-dominated site. Several important seaweeds that could be studied as bioindicators were recorded, such as *Padina* sp., which registered high cover especially in sites near populated areas and backyard pig pens. *Ulva* spp., which are known to form green tide blooms, and *Caulerpa verticillata* were also noted and should be monitored. Some red seaweeds with potential for cultivation were observed (i.e., *Halymenia durvillei* and *Portieria hornemannii*). *Claudea* sp., an uncommon red seaweed with limited distribution in the Philippines, was recorded and needs verification. This study is the first extensive marine macrophyte assessment at the heart of the Verde Island Passage. **(Author's abstract)**

Keywords: *Biodiversity, Bioindicator, Eutrophication, Microbenthic algae, Seagrass, Verde Island Passage, Biology*

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2020,
(Filipiniana Analytics)
NP

Microbial load determination of bacteria on the mobile phones of selected college students

Reyes, Jennifer Ashley H., Flores, Louis Antonio T., Enobio, Cyrille Maria Trinidad B., Durano, Lourivy P., Hinay, Jr., Alfr

More deaths arise due to infectious diseases in spite of the increasing awareness and preventive health practices. This alarming fact is due to the fomites such as kitchen utensils, surfaces of tables and other objects, and even gadgets such as mobile phones which can transmit bacteria. Millions of people use mobile phones and this has become a part of their daily routine. This study dealt with the microbial load determination, isolation and determination of bacteria isolated from mobile phones of randomly selected second year students of the University of the Immaculate Conception. Using quota sampling, five mobile phones were subjected to investigation. Sterile swabs were used in the sampling procedure and swabbing was done before and after (APC) was used for the microbial load determination and culture using standard laboratory media was utilized in the isolation and identification of bacteria. Results indicated that a significant difference on APC values were observed prior and after disinfection of mobile phones with 70% alcohol. Organisms that were commonly isolated were under the genus *Staphylococci* and genus *Streptococci*. Other organisms isolated included *Klebsiella pneumoniae*, species of *Micrococcus*, *Pseudomonas*, *Listeria*, *Lactobacillus*, *Acinetobacter*, *Enetrobacter*, *Bacillus*, *Citrobacter*, *Proteus*,

Providencia, and *Arizona*. Although most of these bacteria are normal flora of the body, they are also still implicated in severe opportunistic infections. **(Author's abstract)**

Keywords: *Medical microbiology, Mobile phones, Aerobic plate count, Culture media, Biochemical testing, Pathogenic bacteria, Philippines, Biology*

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2015,
(Filipiniana Analytics)
NP

0146

Mitochondrial division, fusion and degradation *Murata, Daisuke , Arai, Kenta , Iijima, Miho , Sesaki, Hiromi*

The mitochondrion is an essential organelle for a wide range of cellular processes, including energy production, metabolism, signal transduction and cell death. To execute these functions, mitochondria regulate their size, number, morphology and distribution in cells via mitochondrial division and fusion. In addition, mitochondrial division and fusion control the autophagic degradation of dysfunctional mitochondria to maintain a healthy population. Defects in these dynamic membrane processes are linked to many human diseases that include metabolic syndrome, myopathy and neurodegenerative disorders. In the last several years, our fundamental understanding of mitochondrial fusion, division and degradation has been significantly advanced by high resolution structural analyses, protein-lipid biochemistry, super resolution microscopy and in vivo analyses using animal models. Here, we summarize and discuss this exciting recent progress in the mechanism and function of mitochondrial division and fusion. **(Author's abstract)**

Keywords: *Actin, Dynamin-related GTPase, ER-mitochondria contact, Lipids, Mitophagy, Biology*

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2020 March,
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0147

Mitochondrial dynamics and interorganellar communication in the development and dysmorphism of mammalian oocytes *Udagawa, Osamu , Ishihara, Naotada*

Mitochondria play many critical roles in cells, not only by supplying energy, but also by supplying metabolites, buffering Ca²⁺ levels and regulating apoptosis. During oocyte maturation and subsequent embryo development, mitochondria change their morphology by membrane fusion and fission, and coordinately undergo multiple cellular events with the endoplasmic reticulum (ER) closely apposed. Mitochondrial fusion and fission, known as mitochondrial dynamics, are regulated by family members of dynamin GTPases. Oocytes in animal models with these regulators artificially altered exhibit morphological abnormalities in nearby mitochondria and at the ER interface that are reminiscent of major cytoplasmic dysmorphisms in human assisted reproductive technology, in which a portion of mature oocytes retrieved from patients contain cytoplasmic dysmorphisms associated with mitochondria and ER abnormal morphologies. Understanding organelle morpho-homeostasis in oocytes obtained from animal models will contribute to the development of novel methods for determining oocyte health and for how to deal with dysmorphic oocytes. **(Author's abstract)**

Keywords: *Cytoplasmic dysmorphisms, Dynamin-related GTPase, Mitochondrial fission and fusion, Oocyte maturation, Organelle morphology, Biology*

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0148

Mitochondrial nucleoid morphology and respiratory function are altered in Drp1-deficient HeLa cells

Ota, Azusa , Ishihara, Takaya , Ishihara, Naotada

Mitochondria are dynamic organelles that frequently divide and fuse with each other. The dynamin-related GTPase protein Drp1 has a key role in mitochondrial fission. To analyse the physiological roles of Drp1 in cultured human cells, we analysed Drp1-deficient HeLa cells established by genome editing using CRISPR/Cas9. Under fluorescent microscopy, not only mitochondria were elongated but their DNA (mtDNA) nucleoids were extremely enlarged in bulb-like mitochondrial structures ('mito-bulbs') in the Drp1-deficient HeLa cells. We further found that respiratory activity, as measured by oxygen consumption rates, was severely repressed in Drp1-deficient HeLa cells and that this was reversible by the co-repression of mitochondrial fusion factors. Although mtDNA copy number was not affected, several respiratory subunits were repressed in Drp1-deficient HeLa cells. These results suggest that mitochondrial fission is required for the maintenance of active respiratory activity and the morphology of mtDNA nucleoids in human cells. **(Author's abstract)**

Keywords: *GTPase, Membrane dynamics, Mitochondria, mtDNA, Respiratory complex, Biology*

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2020 March,
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0149

Molecular Identification of the Chinese Pond Mussel *Sinanodonta woodiana* (Lea, 1834) from Mindoro and Leyte Islands, Philippines

Fornillos, Raffy

The Chinese pond mussel *Sinanodonta woodiana* (Lea, 1834) is a large freshwater bivalve species of the family Unionidae and a known invasive alien species. Proper verification of its identity as well as its source population is crucial for the control of its spread. However, its high plastic shell morphology that resembles other non-invasive species of unionids can be an obstacle. The distribution and ecological impact of this invasive unionid is not fully understood and should be further investigated to prevent further spread in the Philippines. In this study, we used the cytochrome oxidase I (*cox1*) gene to verify the identity of putative *S. woodiana* samples collected from Bato Creek in Oriental Mindoro and Lake Danao in Leyte, Philippines and elucidate their source populations. Eighteen cytochrome oxidase subunit I (*cox1*) barcodes were generated from samples collected from Lake Danao, Leyte (n=13) and Bato Creek, Oriental Mindoro (n=5). These barcodes were subjected to Basic Local Alignment Search Tool (BLAST) analysis, which showed that the *cox1* sequences from the Philippine samples matched with those of *S. woodiana* (>94%) found in GenBank. The sequences were then aligned with *cox1* sequences of *S. woodiana* and other unionid representatives from GenBank. Phylogenetic and haplotype network analyses also showed three haplotypes (Hap 1, 2, and 4) of *S. woodiana* samples from Lake Danao and Bato Creek. Hap 1 and 2 are distinct haplotypes observed in Lake Danao samples while Hap 4 is shared between Lake Danao and Bato

Creek samples and have clustered with conspecific specimens from Malaysia and Indonesia, suggesting their potential Island Southeast Asian origin.

Keywords: *idae, DNA barcoding, Invasive Alien Species, Sinanodonta woodiana, Biology*

Science Diliman, Volume No. 32 Issue No. 2, 77-96
2020,
(Filipiniana Analytics)

0150

**Molecular methods and key genes targeted for the detection of fumonisin producing
Fusarium verticillioides: An updated review**
Deepa, N. , Sreenivasa, M.Y.

Contamination with *Fusarium verticillioides* not only diminishes the yield and quality of a crop but also produces fumonisin toxin. Fumonisin is a potential carcinogen which is a global concern, since it is a common contaminant of cereals and cereal-based foods. It is associated with a variety of significant adverse health effects in livestock and animals. Molecular based techniques are available for the detection of fumonisin producing *F. verticillioides* to meet the industry's need for quick results, which cannot be done using conventional mycological methods. Current molecular methods are mainly based on variants of the polymerase chain reaction (PCR) involving gene or species-specific primers, which provide a better approach than traditional methods. The present review discusses advanced molecular methods which are more labor intensive but less time consuming and specifically meant for early detection of fumonisin producing *F. verticillioides*. **(Author's abstract)**

Keywords: *Mycotoxin, Fusarium, Fumonisin, FUM gene, Cereals, Biology*

Food Bioscience, Volume No. Issue No. ,
2019,
(Filipiniana Analytics)
F(S) TP248.65.F66 F66 n32 2019

0151

**Molecular phylogenetic estimates of evolutionary affinities and the first reports of
phenotypic variation in two secretive, endemic reptiles from the Romblon Island Group,
Central Philippines**
Wood, Jr., Perry L. , Gonzalez, Juan Carlos T. , Siler, Cameron D. , Meneses, Camila G., Brown, Raf

We report on the first molecular estimates of phylogenetic relationships of *Brachymeles dalawangdaliri* (Scincidae) and *Pseudogekko isapa* (Gekkonidae), and present new data on phenotypic variation in these two poorly known taxa, endemic to the Romblon Island Group of the central Philippines. Because both species were recently described on the basis of few, relatively older, museum specimens collected in the early 1970s (when preservation of genetic material was not yet standard practice in biodiversity field inventories), neither taxon has ever been included in modern molecular phylogenetic analyses. Likewise, because the original type series for each species consisted of only a few specimens, biologists have been unable to assess standard morphological variation in either taxon, or statistically assess the importance of characters contributing to their diagnoses and identification. Here we ameliorate both historical shortfalls. First, our new genetic data allowed us to perform novel molecular phylogenetic analyses aimed at elucidating the evolutionary relationships of these lineages; secondly, with population level phenotypic data, from the first statistical sample collected for either species, and including adults of both sexes. We reaffirm the distinctiveness of both named taxa as valid species, amend their

diagnoses to facilitate the recognition of both, distinguish them from congeners, and consider the biogeographic affinities of both lineages. Our contribution emphasizes the conservation significance of Sibuyan Island's Mt. Guiting-Guiting Natural Park, the diverse, idiosyncratic biogeographic histories of its variably-assembled, highly endemic reptile fauna, and the critical importance of multiple, repeated, survey–resurvey studies for understanding forest community species composition and the evolutionary history of Philippine biodiversity. **(Author's abstract)**

Keywords: *Biodiversity, Endemism, Forest geckos, Faunal region, Fossoriality, Limb reduction, Biology*

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2020,
(Filipiniana Analytics)
NP

0152

Molecular systematic investigation of Philippine puddle frogs (Anura: Dicroglossidae: *Occidozyga* Kuhl and Van Hasselt, 1822) reveals new candidate species and a novel pattern of species dyads

Brown, Rafe M. , Rico, Edmund Leo B. , Schoppe, Sabine , Chan, K

Focusing on the phylogenetic relationships of puddle frog populations spanning the biogeographic interface between Sundaland (Borneo) and the Philippines, we demonstrate, for the first time, a widespread geographic pattern involving the existence of multiple divergent and co-distributed (sympatric) evolutionary lineages, most of which are not each other's closest relatives, and all of which we interpret as probable distinct species. This pattern of co-occurrence in the form of pairs of ecologically distinct puddle frog forms (dyads), prevails throughout northern Borneo, Palawan, Tawi-Tawi, the Sulu Archipelago, and western Mindanao (Zamboanga). Previously obscured by outdated taxonomy and logistical, legal, and security obstacles to field-based natural history studies, this pattern has remained hidden from biogeographers and amphibian biologists by an uncontested proposal that Philippine *Occidozyga laevis* is a single, "widespread," and "highly variable" species. In this paper we use an integrative synthesis of new genetic data, organismal phenotypic data, historical literature reports, and ecological observations to elucidate an interesting and potentially widespread pattern of puddle frog species coexistence at the Sundaland–Philippine biogeographic interface. Calling attention to this pattern opens promising possibilities for future research aimed at understanding the scope of this dyads pattern, and whether it extends to the more northern reaches of the Philippines. On either side of Huxley's and Wallace's lines, data suggest that the majority of puddle frog dyads at a given locality are not each other's closest relatives (are more distantly related, or non-monophyletic) and, thus, assembled ecologically, likely coexisting now as a result of their ecological tendencies toward distinct microhabitats (warmer stagnant pools in open areas, versus cool, flowing streams enclosed in forest). If these pairs of species types are determined to be the geographic norm among the more isolated, central, and northern, Philippine faunas, an obvious question will be whether they have evolved into dual ecological forms, possibly in response to ecological opportunity and/or reduced competition. **(Author's abstract)**

Keywords: *Biogeography, Taxonomy, Microhabitat, Cryptic species, Biology*

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2020,
(Filipiniana Analytics)
NP

0153

Morpho-Agronomic and Molecular Characterization of Hybrid Rice NSIC Rc318H (Mestiso 48)

Garcia, Kristy Amor A. , Caguiat, Joanne D. , Gramaje, Leonilo V. , Millas, Reneth A. , Ablaza, Marie Stella F. , Baldedara, Leila S. , dela Cruz, Imelda A. , Rigor, Alex T. , Tabanao, Dindo A.

Exploitation of male sterility genes in hybrid rice substantiates heterosis and increased vigor in F1 hybrids. Selection pressure on a limited number of traits during line development has resulted to similar morphological features among modern rice varieties with phenotypic and genotypic characterization being the best way to effectively factor out obscurity. This study aimed to evaluate grain yield and quality, characterize morpho-agronomic traits, assess reaction to biotic stresses, and to determine the molecular profile of Mestiso 48. Data indicated that it exhibited more than 15% yield advantage over the check variety, PSB Rc82, in 50% of the valid trials across regions. Its long and slender grains are comparable with the check but has slightly higher amylose content. Sensory evaluation revealed that a panel of consumers preferred Mestiso 48 over PSB Rc82 and IR64 in its cooked state at 73.9%. Its plants are slightly taller than PSB Rc82 at 109 cm and mature at 110 d after sowing across seasons. Generally, Mestiso 48 is moderately resistant to green leaf hopper and shows intermediate reaction to brown plant hopper and yellow stem borer. Molecular characterization revealed that Mestiso 48 and its female parent are *indica* whereas its male parent is *japonica*. This evidence not only explains the superior performance of this particular hybrid, but also justifies the necessity to consider heterotic groupings in breeding programs. Both parent lines and the hybrid were observed in a subcluster composed of improved varieties in a phylogenetic tree which inferred high levels of genetic similarity. It was released by the National Seed Industry Council on April 2013 for commercial use with the registry number NSIC Rc318H. Since then, it has set the standard for hybrid rice varieties not only for the breeding program at the Philippine Rice Research Institute, but also on a national level through the National Cooperative Testing. Farmers have responded positively to Mestiso 48 in participatory varietal selections in multiple sites across the country since 2015 wet season. **(Author's abstract)**

Keywords: *Characterization, Mestiso 48, NSIC Rc318H, ORF, PR35664H, SNP, Three-line hybrid, Biology*

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2018 April,

(Filipiniana Analytics)

Fil (S) SB189 P45 43/1 2018

0154

Morpho-Physiological Changes in *Euphorbia hirta* L. in Response to Mercury Exposure *Puzon, Juliana Janet M. , Tabayoyong, Elaine R. , Jumawan, Hazel Joy M.*

Euphorbia hirta (L.) plants were grown and exposed for three days in Hoagland's nutrient solution amended with different concentrations of HgCl₂, viz: 0.0 ppm (control), 0.1 ppm, and 1.0 ppm. The morpho-physiological responses of the different organs to Hg exposure and the ability of the plant to translocate and accumulate Hg in the leaves were examined. No significant morphological responses to mercury exposure were observed specifically in root length, length of mature stems, surface area of the young and mature leaves, as well as in the biomass of the roots, mature stems, flowers, young leaves, and mature leaves. The length of young stems, however, increased with increasing concentration of Hg treatment. The levels of photosynthetic pigments, viz., chlorophyll *a* and *b*, total chlorophyll, and carotenoids of the leaves and flowers were not significantly affected by Hg treatments, except for the chlorophyll *a* of flowers, and the chlorophyll *b* and total chlorophyll of the mature leaves. No significant changes in total chlorophyll content of the stems and in the carotenoid contents of young leaves, mature leaves, and flowers were observed in response to increasing HgCl₂ concentrations. Anthocyanin content in young stems was higher in the control plants compared to their Hg-treated counterparts while the reverse trend was observed in mature stems. Based on the results, the maintenance of carotenoids levels in the leaves and flowers, the increase in chlorophylls in the mature leaves and flowers, and the increase in anthocyanin content in the mature stems serve as protective, adaptive response mechanisms against Hg toxicity. Therefore, the overall morpho-physiological responses of the various organs of *E. hirta* revealed its tolerance to Hg exposure. On the other hand, atomic absorption spectrophotometry (AAS)-hydride vapour generation method revealed the ability of *E. hirta* to translocate and accumulate Hg in its leaves. The results of this study have important implications on the utilization and cultivation of the plant for medicine and for mercury phytoremediation. **(Author's abstract)**

Keywords: *Euphorbia hirta*, *Heavy metals*, *Hyponics*, *Mercury*, *Phytoremediation*, *Biology*

Philippine Journal of Science, Volume No. 144 Issue No. 2, 161-170
2015 December,
(Filipiniana Analytics)
Fil (S) Q1 P55 144/2 2015

0155

Myxomycetes of the Caramoan Islands and an update on the species found in the Bicol Peninsula, Philippines

Stephenson, Steven L. , Dela Cruz, Thomas Edison E. , Dagamac, Nikki Heherson A. , Macabago, Sittie Ai

The main objective of this study was to characterize the assemblages of myxomycetes on isolated Philippine islands through a correlational study using geographical and ecological distance in the Caramoan Islands, including an updated checklist of the myxomycetes of the Bicol Peninsula. Four islands of varying sizes and distances from each other, but all within relatively close proximity to the mainland of the Bicol Peninsula, were surveyed. A combination of traditional and more contemporary ecological tools was used to analyze diversity indices among and between the islands. Among the four islands, Matukad Island recorded the highest species richness (46.8) and taxonomic diversity index (2.6), while ranking next to Lahos island in terms of species diversity (7.9). Pairwise comparisons using community similarity indices and clustering analysis consistently showed that Lahos and Matukad are the most similar to each other, while also being closer to one another but situated farthest from the mainland. On the other hand, the two smallest islands, which were also closest to each other and to the mainland, grouped together using clustering analysis but recorded the lowest pairwise percentage similarity value. The ecological patterns in this study appear to follow the unified neutral theory of biodiversity and biogeography more than the insular biogeography theory. In addition, this study added 16 new morphospecies to the list of myxomycetes known from the Bicol Peninsula, which brings the total to 73, including one new record for the country [Lamproderma arcyrioides (Sommerf.) Rostaf.] (Author's abstract)

Keywords: *Slime molds*, *Insular*, *Biodiversity*, *Unified neutral theory*, *Biology*

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2020,
(Filipiniana Analytics)
NP

0156

The Negros Ark: A Hypothesis The systematics and biogeography of Rhopalocera (Lepidoptera) in the Philippines

Badon, Jade As

Current distributional data on Philippine butterflies suggests that colonization and exchange of species between Luzon and Mindanao are hypothesized to have occurred during the Miocene Epoch (23-5.3 million years ago). Species from the families Pieridae, Hesperidae, and Zygaenidae were set as an example to explain some disjunction of distribution of some species in the archipelago. The hypothesis will definitely become an interest in the field of biogeographical and phylogenetic studies in the country. (Author's abstract)

Keywords: *Butterfly*, *Colonization*, *Biogeography*, *Biology*

Philippine Journal of Systematic Biology, Volume No. 12 Issue No. 2, 52-61
2018,

Nepenthes cabanae (Caryophyllales, Nepenthaceae), a new species of pitcher plant from Central Mindanao, Philippines

Lagunday, Noel E., Amoroso, Victor

A new endemic species, *Nepenthes cabanae*, belonging to sect. *Insignes* is described from the Mt. Pantaron range of central Mindanao. The species is assessed as Critically Endangered. This discovery brings the number of *Nepenthes* species in this mountain range to eight. Mt. Pantaron is currently not a protected area, but the diversity of *Nepenthes* taxa suggests concerted efforts should be made to develop a conservation strategy to preserve and protect the area. (Author's abstract)

Keywords: *Carnivorous plants, Nepenthes, Pantaron range, Taxonomy, Threatened species, Biology*

Philippine Journal of Systematic Biology, Volume No. 13 Issue No. 1, 39-45
2019,
(Filipiniana Analytics)
NP

Neurotrophic properties and the *de novo* peptide sequencing of edible bird's nest extracts

Yew, Mei Yeng , Koh, Rhun Yian , Chye, Soi Moi , Abidin, Syafiq Asnawi Zainal , Othman, Iekhsan , Ng, Khuen Yen

Neural stem cells (NSC) are multipotent precursor cells in the neurogenic regions of the brain which respond to trophic factors to achieve functional recovery from neurodegenerative diseases. Edible bird's nest (EBN) is a salivary product of *Aerodramus* swiftlets and may contain potent neurotrophic compounds. Crude and water extracts of EBN were shown to have neurotrophic properties by promoting proliferation and migration of the NSC model, embryonic mouse neuroectodermal cells (NE-4C). Neuronal differentiation of retinoic acid-primed NE-4C was also increased after being treated with EBN extracts. Using *de novo* peptide sequencing with tandem mass spectrometry, a total of 29 proteins were identified from EBN extracts. It is suggested that the repulsive guidance molecule domain family member B, which has been shown to promote neurite extension and axonal growth, as well as proteins involved in the process of cell proliferation and migration such as protein lin-9 and hyaluronan mediated motility receptor might be involved in the neurotrophic effects of EBN extracts. Other proteins found in EBN extracts were known to have potential roles in immunity, extracellular matrix formation, cell survival and apoptosis, antioxidation, and common cellular processes, which may be implicated in other EBN studies. Seven hypothetical proteins suggested using the PEAKS Studio 7.0 software did not have a match in the Swiss-Prot database, which may need to be further characterized in the future. In conclusion, this study described the neurotrophic properties of EBN extracts and supports the use of EBN as a potential functional food against neurodegenerative diseases. (Author's abstract)

Keywords: *De novo peptide sequencing, Edible bird's nest, Aerodramus, Neural stem cells, Neurotrophic effects, Biology*

Food Bioscience, Volume No. Issue No. , 1-12
2019,
(Filipiniana Analytics)
F(S) TP248.65.F66 F66 n32 2019

Some new records of *Selaginella* from China

Zhang, Xia

Five Asian species of *Selaginella* distributed in the neighboring regions of China were recently discovered within the territory of China. They are *Selaginella pallida* Spring, *S. pentagona* Spring, *S. subdiaphana* (Wall. ex Hook. & Grev.) Spring, *S. tenuifolia* Spring, and *S. shakotanensis* (Franch. ex H. Takeda) Miyabe & Kudo. The first four species are mainly distributed in the East Himalaya, while the last one is from Northeast Asia. (Author's abstract)

Keywords: *Selaginella*, New records, Asia, China, Biology

Philippine Journal of Systematic Biology, Volume No. 12 Issue No. 1, 20-23
2018,
(Filipiniana Analytics)
NP

A new species of *Diplycosia*: *D. benitotanii* Argent (Ericaceae) from Mt. Halcon in the Philippines is described in honour of the late Dr. Benito Tan

Argent,

A new species *Diplycosia benitotanii* (Ericaceae) is described from Mt. Halcon, Mindoro, Philippines in honour of the late Dr. Benito C. Tan. Comments are made on the morphological similarities with other Philippine species in this genus. (Author's abstract)

Keywords: New species, *Diplycosia*, Ericaceae, Mt. Halco, Mindoro, Philippines, Biology

Philippine Journal of Systematic Biology, Volume No. 12 Issue No. 1, 73-76
2018,
(Filipiniana Analytics)
NP

Three new species of *Lepidemathis* Simon, 1903 (Araneae: Salticidae) from the Philippines

Barrion, Alberto T. , Barrion-Dupo, Aimee L

Three new species of the pluridentate spider *Lepidemathis* Simon, 1903 are described from Luzon Island, Philippines. *Lepidemathis cavinti* n. sp. is from the primary forest in Cavinti, Laguna province; *Lepidemathis dogmai* n. sp. is from the boulder in a dry river in Mauban, Quezon province; and *Lepidemathis lipa* n. sp. is from bamboo trees near a young cacao orchard in Lipa City, Batangas province. Photographs are provided to facilitate species identification. (Author's abstract)

Keywords: Araneae, Salticidae, *Lepidemathis cavinti* n. sp., *Lepidemathis dogmai* n. sp., *Lepidemathis lipa* n. sp., Luzon Island, Philippines, Biology

**A new species of *Metapocyrtus* (Curculionidae: Entiminae: Pachyrhynchini) from
Southern Mindanao, Philippines**

Coritico, Fulgent P. , Amoroso, Victor B. , Mohagan, Alman B. , Patano, Jr., Romeo R., Yap, Shery

Owing to the flightless behaviour of the Pachyrhynchini, new species are still being discovered in unexplored parts of the region. Hence, we described a new species: *Metapocyrtus bronzi* sp. nov. discovered in Mount Hamiguitan Range Wildlife Sanctuary, Davao Oriental, Mindanao, Philippines. Habitat, ecology, and threats are also described. **(Author's abstract)**

Keywords: *Curculionid, Mount Hamiguitan, New species, Terminalia, The Philippines, Biology*

**A new species of reed snake, genus *Calamaria* (Colubridae: Calamariinae), from
Mindoro Island, Philippines**

Brown, Rafe M. , Leviton, Alan E. , Weinell, Jeff

We describe a new species of reed snake of the genus *Calamaria* Boie 1827, from Mindoro Island, Philippines. The new species differs from all other species of *Calamaria* by having the following combination of characters: a high number of subcaudal scale pairs (> 40 in males, > 30 females) and ventrals + subcaudals (> 205 in males, > 210 in females); mental scale not contacting chin shields; dorsal surface of head, body, and tail uniformly dark brown; and ventral surface of body (extending to include part or all of first longitudinal row of dorsals) uniformly pale (yellow or white in life). The new species is likely most closely related to *Calamaria schlegeli* Duméril, Bibron, and Duméril 1854, which also has a high number of subcaudal scales compared to other *Calamaria* species. The new species is the second *Calamaria* species known from Mindoro Island and the eighth known from the Philippines, and its presumed distant relationship from other Philippine *Calamaria* suggests an additional colonization of the Philippines by this genus from continental Asia. **(Author's abstract)**

Keywords: *Biodiversity, Biogeography, Calamaria alcalai new species, Serpentes, Squamata, Systematics, Biology*

A new species of Sun Skink (Reptilia: Scincidae: *Eutropis*) from the Zamboanga Peninsula, southwestern Mindanao Island, Philippines
Brown, Rafe M. , Sanguila, Marites B. , Barley, Anth

We describe a new species of lizard in the genus *Eutropis* Fitzinger 1843 from the southwestern tip of the Zamboanga Peninsula on the western part of Mindanao Island, Philippines. The new species is related to *Eutropis rugifera*, which is a secretive, forest-adapted skink that ranges widely outside the Philippines from the western extent of its distribution on Nicobar Island (the type locality) through southern Peninsular Malaysia, Sumatra and the Mentawai islands, Borneo, Java, and as far east as Bali Island. The discovery of a new, morphologically distinct, and genetically highly divergent Sun Skink lineage in the low elevation forests of Zamboanga Peninsula creates a puzzling disjunct geographic distribution (*E. rugifera* has not been reported from the Sulu Archipelago). The new species is estimated to have diverged ~10–16 mya from *E. rugifera*, from which it appears to have an extralimital and isolated distribution. Considering the dynamic geological history and ancient continental origin of the Zamboanga Peninsula, colonization by the new species may have been facilitated by pre-Pleistocene overseas long-distance dispersal, saltatory range expansion and subsequent contraction/extinction in the Sulu Archipelago, and/or possibly paleotransport on the ancient crustal fragment of Zamboanga. The new species is known only from Zamboanga City's primary surface water supply catchment at the lowest elevations inside the boundaries of Pasonanca Natural Park, despite the fact that there have been historical surveys of herpetological diversity at multiple sites to the northeast (Zamboanga, western Mindanao) and to the southwest (Sulu Archipelago). The new species, thus, may be limited to just the tip of the Zamboanga Peninsula, possibly rendering Pasonanca's low elevation forests its most critical habitat resource for long term persistence and survival of the species. **(Author's abstract)**

Keywords: *IUCN Red List, Palawan microcontinent block, Pasonanca Natural Park, Sulu Archipelago, Surface catchment watershed biodiversity, Biology*

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2020,
(Filipiniana Analytics)
NP

0165

A new subspecies of microsnail from Masungi Georeserve, Rizal, Philippines
Lipae, Harold B. , Estabillo, Angelique L. , Fontanilla, Ian Kendrick C. , de Chavez, Emmanuel Ry

A new subspecies of microsnail, *Hypselostoma latispira masungiensis* subsp. nov., is described based on shell morphology and molecular characters. This new subspecies is distinguished from *H. l. latispira* from Baguio City, Benguet Province by having relatively larger major width size, additional apertural teeth (interpalatal plica), larger body whorl and apertural width, and clustering based on location. The collected samples from Masungi Georeserve, Rizal Province appear to be an ecophenotype as indicated by the novel site congruent to the clade separation of Masungi and Baguio *H. latispira*. Neighbor-joining and maximum likelihood trees also demonstrated that the two sample groups clustered separately, with bootstrap support of 84% and 78%, respectively. However, pairwise distance comparison revealed that there is only an average of 0.0131 ± 0.0126 genetic distance (99.98%) between the two populations, suggesting that they are most likely similar species; thus, the proposal of making it a subspecies. This is the first report on the new distributional record outside the type locality and a new subspecies of *H. latispira* **(Author's abstract)**

Keywords: *Land snail, Karst, Interpalatal plica, Pairwise distance comparison, Biology*

Philippine Journal of Systematic Biology, Volume No. 14 Issue No. 3, 1-12
2020,
(Filipiniana Analytics)
NP

Notes on *Distichophyllum armatum* (Daltoniaceae, Bryophyta) in Thailand
Juengprayoon, Wanwisa, Suwanmala, Orawanya, Chantanaorrapint, Sa

Distichophyllum armatum (E.B. Bartram) B.C. Ho & L. Pokorny, is newly discovered in lower montane forest in southern Thailand. A description and line drawing are provided, and its diagnostic characters and geographical distribution are briefly discussed. (Author's abstract)

Keywords: *Bryophyte, Diversity, Moss, Thai-Malay Peninsula, Taxonomy, Biology*

Philippine Journal of Systematic Biology, Volume No. 12 Issue No. 1, 54-57
 2018,
 (Filipiniana Analytics)
 NP

Occurrence of Intestinal Helminth Parasites in Domestic Dogs (*Canis familiaris domesticus*) in Arevalo, Iloilo City, Philippines Using the Parasep Fecal Parasite Concentration Technique

Lopez, John Christian, Aguirre, Marc Jerome, Dalisay, Jervin

This study tested domestic dogs in Arevalo Iloilo City Philippines for the prevalence and intensity of helminth parasites using the parasep fecal parasite concentration technique. The parasites were identified along with the risk factors that accompanied it. Results showed that 21 out of 30 dogs were positive for infection with *Ancylostoma* sp. as the most prevalent species with a prevalence of 30 percent and intensity of 93 eggs per gram. This study concluded that there is an occurrence of intestinal parasitic infection of domestic dogs in Arevalo, Iloilo City, Philippines. (Author's abstract)

Keywords: *Canis familiaris domesticus, Intestinal Helminth Parasites, Domestic Dog, Parasep Fecal Parasite Concentration Technique, Biology*

Publiscience A Research Journal of High School Researches, Volume No. 1 Issue No. 1, 95-99
 2018 May,
 (Filipiniana Analytics)
 Fil (S) Q76 P45 1/1 2018

Occurrence of Thraustochytrids on fallen mangrove leaves from Pagbilao Mangrove Park, Quezon Province

Dedeles, Gina R., Icaro, Cendrix Kyle L., Estrada, Ana Marinella T., Arafiles, Kim Hazel V., Mappala, Arlice Kristel A., Perez, Justine Gr

Thraustochytrids are marine protists that can be abundantly found on fallen mangrove leaves. These organisms are drawing attention from scientists and commercial manufacturers alike primarily because they are able to produce omega-3 polyunsaturated fatty acids (PUFA) such as docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) in copious amounts within their cells. Scientists from Brazil, Malaysia, Taiwan, and Thailand have capitalized on their country's thraustochytrids; yet, in the Philippines only a limited number of researches have been conducted on these organisms. Thus, the significance of this research is to further investigate, supplement additional information, and add to the number of existing studies on the thraustochytrids from Philippine

mangroves. This research isolated, purified, and characterized thraustochytrids present in yellow, yellow brown, and brown leaves from two (2) mangrove species—*Avicennia* and *Rhizophora* spp. in Pagbilao Mangrove Forest. The thraustochytrids from each leaf sample of the two mangrove species were isolated and purified on GYPSA (Glucose Yeast Peptone Sea Salt Agar) media. Morphological characterization was done through microscopy for partial identification. The isolates present on fallen mangrove leaves from Pagbilao, Quezon were preliminarily identified as morphologically indicative to either be *Aurantiochytrium*, *Hondaea*, or *Monorhizochytrium*. (Author's abstract)

Keywords: *Marine protists, Heterotrophs, Thraustochytriaceae, Philippines, Biology*

Philippine Journal of Systematic Biology, Volume No. 14 Issue No. 1, 1-8
2020,
(Filipiniana Analytics)
NP

0169

Old but not obsolete: an enhanced high-speed immunoblot

Higashi, Sayuri L , Yagyu, Kazuya , Nagase, Haruna , Pearson, Craig S , Geller, Herbert M , Katagiri, Yasuhiro

The immunoblotting technique (also known as western blotting) is an essential tool used in biomedical research to determine the relative size and abundance of specific proteins and protein modifications. However, long incubation times severely limit its throughput. We have devised a system that improves antigen binding by cyclic draining and replenishing (CDR) of the antibody solution in conjunction with an immunoreaction enhancing agent. Biochemical analyses revealed that the CDR method reduced the incubation time of the antibodies, and the presence of a commercial immunoreaction enhancing agent altered the affinity of the antibody, respectively. Combination of the CDR method with the immunoreaction enhancing agent considerably enhanced the output signal and further reduced the incubation time of the antibodies. The resulting high-speed immunoblot can be completed in 20 min without any loss in sensitivity. Further, the antibodies are fully reusable. This method is effective for both chemiluminescence and fluorescence detection. Widespread adoption of this technique could dramatically boost efficiency and productivity across the life sciences. (Author's abstract)

Keywords: *Chemiluminescence, Fluorescence, Immunoblot, Immunoreaction enhancing agent, Western blot, Biology*

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0170

Optimization of cultural conditions for *Labyrinthula* species isolated from mangrove leaves

Dedeles, Gina R. , Gacelo, Marine Christine P. , Pastor, Julie Ann S. , Ferrer, Angelica Anne V. , Dee, Jade Ange

Labyrinthulids which are marine osmoheterotrophic, straminipilan protists under Labyrinthulomycetes, thrive in brackish waters and mangrove-rich areas. Despite their long history and widespread occurrence in marine and terrestrial environments, this group of organisms is less studied compared to their closely-related organisms such as thraustochytrids, and so far less is known about their optimum growth conditions in laboratory setups. Although the labyrinthulid group is important ecologically, our understanding of their true culturable diversity, isolation,

and long-term viability remains poorly documented. Thus, three labyrinthulid strains (AK1, DV1, and DV2) were studied here for culture optimization, mode of growth and prolonged cell viability (at least 14 d) by using customized agar media. Optimal temperature (35°C) and pH conditions (pH 6.0-7.0) were best for their growth specifically on media with 6% glucose concentration and 60‰ salinity (parts per thousand). Broth medium with carabao grass extract was suitable in keeping the isolates viable for more than 14 d but their growth in extract-based media was not significantly different from those grown on base medium, Glucose-Yeast Extract-Peptide agar (GPYA). Although it is not well understood what defense mechanism this organism needs to provide them longer viability in the environment, this study gives insights on their preferred culturable conditions. (Author's abstract)

Keywords: *Culture medium, Labyrinthulids, Microbiology, Mycology, Protista, Biology*

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NP

0171

An overview on Philippine estuarine oomycetes *Bennett, Reuel M., Thines, Ma*

Estuarine saprotrophic oomycetes are a group of eukaryotic, fungal-like protists of the Kingdom Straminipila. Species classified as estuarine oomycetes are commonly present on mangrove leaf litter and saltmarsh plant debris. They are distributed over several families (i.e. Peronosporaceae, Pythiaceae, Salisapiliaceae, and Salispinaceae). It is estimated that there are more than 100 species of estuarine oomycetes and, surprisingly, some supposedly terrestrial phytopathogenic hemibiotrophic oomycetes, e.g. *Phytophthora elongata*, *Ph. insolita*, and *Ph. ramorum*, are likewise present in the estuarine biome. In the Philippines, this group has been neglected for several decades as compared to the obligate biotrophic and hemibiotrophic members of Peronosporaceae and Albuginaceae. In this account, a general overview on the systematics and phylogeny of estuarine oomycetes is given. Further, the state of knowledge regarding thallus organization, taxonomy, habitat, and status of Philippine oomycetes are presented. (Author's abstract)

Keywords: *Estuarine, Mangroves, Oomycetes, Phylogeny, Taxonomy, Biology*

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0172

An overview on the biology and phylogeny of the early-diverging oomycetes *Buaya, Anthony T., Thines, Mar*

Holocarpic oomycetes are ubiquitous especially in marine and freshwater environments. These organisms are mostly obligate biotrophic parasites and members of the deep-branching, early-diverging clades of the Oomycota, comprising of several genera that had their phylogenetic position only recently investigated (*Miracula*, *Olpidiopsis*, *Eurychasma*, *Haptoglossa*, *Anisolpidium*, *Diatomophthora*, *Pontisma*, *Haliphthoros*) as well as some unresolved genera (*Ducellieria*, *Petersenia*, *Sirolopidium*, *Eurychasmidium*, *Pseudosphaerita*, *Rozellopsis*). Despite their widespread occurrence and importance for understanding the evolution of the oomycetes, knowledge on the biology and ecology of these bizarre organisms is still fragmentary for temperate regions and almost absent

for the tropics. Here, an overview on the current state of knowledge on early-diverging oomycetes is presented, with emphasis on the general biology, systematics and ecology. **(Author's abstract)**

Keywords: *Early-diverging clades, Oomycetes, Oomycota, Phylogeny, Systematics, Biology*

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0173

PCR-based approach for site-specific conjugation of long double-stranded DNA to a single-domain VHH antibody

Akazawa-Ogawa, Yoko , Komatsu, Yasuo , Nakajima, Yoshihiro , Kojima, Naoshi , Hagihara, Yoshihisa

Site-specific conjugation of double-stranded DNA using antibodies enables the development of unique applications for antibody–drug conjugates utilizing recent advances in nucleic acid medicines. Here, we describe a novel method to conjugate a camelid-derived single-domain VHH (variable domain of a heavy chain antibody) antibody with arbitrarily sized double-stranded DNA by PCR. Cysteine in anti-human epidermal growth factor receptor (EGFR) VHH was replaced by alanine, and an unpaired cysteine was introduced at the carboxyl terminus. These modifications enabled site-specific labelling with a maleimide-modified DNA oligo via thioether bond formation; the ensuing product—single-stranded DNA conjugated at the carboxyl terminus of VHH—retained its affinity for EGFR. To investigate whether this VHH–single-stranded DNA conjugate might be used as a forward primer, we subjected it to PCR, producing 100–500 bp DNA. We confirmed the amplification of the VHH–double-stranded DNA conjugate by examining its mobility on acrylamide gel; retention of the binding affinity of the conjugate for EGFR was identified by immuno-PCR. **(Author's abstract)**

Keywords: *Disulphide, DNA conjugation, Heat resistance, PCR, VHH antibody, Biology*

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0174

Persulphide-responsive transcriptional regulation and metabolism in bacteria

Shimizu, Takayuki , Masuda, Shinji

Hydrogen sulphide (H₂S) impacts on bacterial growth both positively and negatively; it is utilized as an electron donor for photosynthesis and respiration, and it inactivates terminal oxidases and iron-sulphur clusters. Therefore, bacteria have evolved H₂S-responsive detoxification mechanisms for survival. Sulphur assimilation in bacteria has been well studied, and sulphide:quinone oxidoreductase, persulphide dioxygenase, rhodanese and sulphite oxidase were reported as major sulphide-oxidizing enzymes of sulphide assimilation and detoxification pathways. However, how bacteria sense sulphide availability to control H₂S and sulphide metabolism remains largely unknown. Recent studies have identified several bacterial (per)sulphide-sensitive transcription factors that change DNA-binding affinity through persulphidation of specific cysteine residues in response to highly reactive sulphur-containing chemicals and reactive sulphur species (RSS). This review focuses on current understanding of the persulphide-responsive transcription factors and RSS metabolism regulated by RSS sensory proteins. **(Author's abstract)**

Keywords: *Bacterial transcription, Cysteine modification, Persulphide, Reactive sulphur species, Sulphur transfer, Biology*

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0175

A phenetic analysis of Philippine Rubus species (Rosaceae) by morphology

Madulid, Domingo A. , Real, Mark Step

The taxonomy of the Philippine Rubus species was studied through a phenetic analysis of the morphological data from preserved specimens. After recording the character states, the data were analyzed using cluster analysis and PCA, and the resulting analysis allowed the delimitation of morphologically similar Rubus species. Specimens of the Rubus genus collected in the country were separated into two clusters distinguished by leaf structure. Specimens of the same species are often found in multiple sub-clusters, which suggests the high degree of variation within a species. PCA of morphological data from Rubus species show that leaf and floral characters, which include the maximum number of lobes, pedicel pubescence, outside pubescence of the hypanthium, apex of the simple leaf blade, and the apical process of the sepals, explain the variation in Rubus species in the Philippines. (Author's abstract)

Keywords: *Cluster analysis, Brambles, Rosaceae, PCA, Biology*

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(Filipiniana Analytics)
NP

0176

Philippine Mycology's central DOGMA

Dela Cruz-Papa, Donna May A. , Papa, Rey Do

This paper outlines the unique contributions of this Festschrift's honoree, Prof. Irineo J. Dogma Jr. to the field of mycology, microbiology, and systematics. These are evidenced by his numerous publications, involvement and leadership in professional scientific organizations and editorship in pioneering scientific publications in the Philippines.

His publications included some of the most notable papers on aquatic zoospore fungi, including those co-authored with his mentor - Prof. Frederick K. Sparrow, a pioneer in the study of aquatic phycomycetes. Through an analysis of his previously published works and interviews with several of his family members, closest colleagues, and students, we get a glimpse of Dr. Dogma as a family man, an academic, a researcher and a well-loved and respected mentor. (Author's abstract)

Keywords: *Irineo J. Dogma, Jr., Festschrift, Microbiology, Mycology, Zoospore fungi, Biology*

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NP

The Philippine slime molds after Dogma's 1975 list - How far have we been?

delacruz, Thomas Edison E. , Dagamac, Nikki Heher

One of the pioneering taxonomic works about the Philippine slime molds (that includes the myxomycetes and dictyostelids) were the annotated check list reported by Dogma in 1975 published in the Kalikasan - Philippine Journal of Biology. This report meaningfully contributed to the succeeding studies conducted with the Philippine slime molds after almost four decades of stagnancy. Hence, this review paper tackles how the studies regarding the Philippine slime molds progressed since Dogma's 1975 annotation, particularly in further understanding the ecology and systematics of these fungus-like protist. At present day, the total number of myxomycetes species in the Philippines is 159 while the number of records for dictyostelids is 12. (Author's abstract)

Keywords: *Amoebozoa, Asian Palaeotropic, Myxomycetes, Species list, Tropics, Biology*

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Physico-chemical and functional properties of dried male date palm flowers

Karra, Sirine , Sebii, Haifa , Borchani, Chema , Danthine, Sabine , Blecker, Christophe , Attia, Hamadi , Besbes, Souhail , Bouaziz, Mohamed Ali

The physico-chemical, microstructure, thermal and functional properties of Deglet Nour male date palm flowers (MDPF) of *Phoenix dactylifera* L. were studied. The main objective was to add value to this discarded by-product as a functional raw material and assess its suitability to be incorporated into foods. The pollen-free flowers were dried at 40°C. Then, a milling step was used to obtain the powdered MDPF. The results showed high amounts not only of dietary fibres (68%), especially insoluble fibre (64%), but also of proteins (14.8%), which confirmed the nutritional value of the MDPF and its possible use in dietetic products. The physical properties showed that dried MDPF were safe from deterioration, had a light colour suitable for incorporation, had an amorphous structure helpful for preservation and were thermally stable suggesting that MDPF could be a natural stabilizer. Moreover, MDPF showed interesting functional properties expressed by relatively high swelling values, and water and oil holding capacities (6.3 ml/g dry sample, 4.95 g water/g dry sample and 4.42 g oil/g dry sample, respectively), which may be helpful in foods to minimize some technical problems (e.g., improving emulsion stability in fatty products and avoiding syneresis). (Author's abstract)

Keywords: *Male date palm flowers, Phoenix dactylifera L., Nour variety, Biology*

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Physicochemical and functional properties of extruded dietary fiber from mushroom *Lentinula edodes* residues

Xue, Zihan , Ma, Qiqi , Guo, Qingwen , Santhanam, Ramesh Kumar , Gao, Xudong , Chen, Zhongqin , Wang, Cong , Chen, Haixia

Dietary fiber from *Lentinula edodes* (LEDF) residues were obtained using various extrusion conditions and their physicochemical and functional properties, such as glucose adsorption capacity (GAC), water holding capacity, oil holding capacity, glucose retardation (GRI) and bile acid retardation index (BRI) were measured. Based on principal component analysis, the optimal extrusion conditions were determined, i.e., extrusion temperature 130°C, moisture content 40% and screw speed 125 r/min. The dietary fiber contained 3.6% soluble and 88% insoluble dietary fiber and the major components were cellulose (26%) and hemicellulose (42%). Compared with untreated fibers, GAC and BRI of LEDF with optimal extrusion conditions increased 0.46 mg/mg and 28%, respectively. Regression analysis suggested that GRI and hemicellulose showed a significant positive correlation ($p \leq 0.05$). Overall, it could be suggested that the LEDF obtained with the optimized extrusion condition might be used as a potential ingredient in functional foods. **(Author's abstract)**

Keywords: *Dietary fiber, Lentinula edodes, Mushroom, Biology*

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(Filipiniana Analytics)
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0180

Physicochemical, structural and sensory properties of smooth hound autolysates-sugar conjugates formed using a glycosylation reaction

Abdelhedi, Ola , Salem, Ali , Souissi, Nabil , Nasri, Rim , Nasri, Moncef , Jridi, Mourad

The conjugation of smooth hound viscera autolysates (SHVA) and glucose (Gluc) through the Maillard reaction (MR) was studied. The degree of glycation, free amino groups, color parameters, structural (infrared and scanning electron microscopy analyses) and antioxidant properties of the resulting MR products (MRP) were studied. The degree of glycation reached 87%, at the end of the reaction, suggesting the effectiveness of the MR with heating. In addition, the MR improved the sensory attributes of the MRP, particularly, by reducing the unfavorable bitter taste. Structural changes were observed in the infra-red spectra of the final conjugates, compared to the un-conjugated ones. These changes were consistent with the antioxidant activities of the different samples. It was found that the antioxidant capacity of the MRP derived from two different autolysates increased with heating time. Thus, the combination of SHVA and Gluc led to the production of bioactive products with different structural and enhanced biological characteristics. **(Author's abstract)**

Keywords: *Smooth hound shark, Mustelus mustelus, Glucose, Maillard reaction products, Biology*

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F(S) TP248.65.F66 F66 n32 2019

0181

Physicochemical, textural, antioxidant and sensory characteristics of microalgae-fortified canned fish burgers prepared from minced flesh of common barbel (*Barbus barbus*)

Atitallah, Ali Ben , Barkallah, Mohamed , Hentati, Faiez , Dammak, Mouna , Hlima, Hajer Ben , Fendri, Imen , Attia, Hamadi , Michaud, Philippe , Abdelkafi, Slim

Microalgae have been used as natural ingredients in popular fish-based products to increase their nutritional value. The impact of the addition of *Chlorella minutissima*, *Isochrysis galbana*, *Picochlorum* sp. at concentrations of 0.5, 1, and 1.5% w/v on the texture and sensory attributes of canned burgers were investigated. Compared to controls, fish burgers containing 0.5% of *C. minutissima*, 1% of *I. galbana* and 1% of *Picochlorum* sp. had better texture and sensory properties ($p < 0.05$). These microalgae supplemented burgers showed higher swelling ability as well as water and oil holding capacities, due to the dietary fiber content of microalgae. Moreover, microalgae supplemented burgers were characterized as having low a^* and b^* values, which made the color appear to be pale orange. Because of the presence of pigments (chlorophylls, carotenoids and phycocyanin), microalgae increased the antioxidant activities of fresh fish burgers. So, microalgae could be used as nutritious ingredients to produce new fish-based products. **(Author's abstract)**

Keywords: *Common barbel, Barbus barbus, Microalgae, Chlorella minutissima, Isochrysis galbana, Picochlorum sp, Biology*

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0182

***Pinanga lepidota* (Arecaceae: Arecoideae), a new record for the Philippines from Palawan Island**

Malabrigo, Jr., Pastor L. , Logatoc, Eugene L.R. , Fernando, Edwino S., Adorador, Jir

Pinanga lepidota (Arecaceae), previously known only from Borneo, is reported here as a new record for the Philippines from Palawan Island. A key to the identification of similar species of *Pinanga* in the Philippines is provided, including brief notes on Bornean Arecaceae elements in Palawan. **(Author's abstract)**

Keywords: *Mt Mantalingahan, Palmae, Palms, Pinanga, Biology*

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NP

0183

Plant growth promoting potential of indigenous mine tailing nitrogen fixing bacteria and commercial biofertilizers on narra (*Pterocarpus indicus*)

, Aggangan, Nelly S.

Indigenous beneficial microbes such as nitrogen fixing bacteria (NFB) are known to function better than an introduced counterpart. Narra (*Pterocarpus indicus*) is a favored legume tree species for reforestation due to its fast growth in a wide environmental conditions, premium wood quality, dual association with arbuscular mycorrhizal fungi (AMF) and NFB and endemic in the Philippines. This experiment was conducted to compare the plant growth promoting potential of NFB isolated from mine tailing area with that of commercial biofertilizers. Selected plants from the mine tailing site in Barangay Capayang, Mogpog, Marinduque were collected, and the indigenous NFB were isolated from the roots. Four fast-growing NFB were four NFBs isolated from roots of

plants growing in mine tailing site were inoculated singly or in combination and with or without biofertilizers [BioNTM (coded as B) and MYKORICH® (coded as M) produced at the National Institute of Molecular Biology and Biotechnology (BIOTECH), University of the Philippines Los Baños (UPLB)]. The treatments were: control, BioNTM, MYKORICH®, NFB1, NFB2, NFB3, NFB4, NFB1+2, NFB1+3, NFB1+4, NFB2+3, NFB2+4, NFB3+4, NFB1-4 (1+2+3+4), NFB1-4+B, NFB1-4+M, and NFB1-4+B+M. Results after 4 months showed that the four combined NFB produced the heaviest stem, leaves, nodules, and total plant dry weight. NFB count in the soil was highest in NFB4, tallest height and biggest stem diameter increments were in BioNTM and MYKORICH® inoculated seedlings, respectively. NFB2 gave the highest leaf area cm², while NFB1-4+M had the lowest. These outcome indicate that the indigenous isolates could be of potential use as biofertilizers in forestry practices and in agricultural production. However, the field performance of these indigenous mine tailing NFB should be evaluated.

Keywords: *arbuscular mycorrhizal fungi, Azospirillum, biofertilizer, Leguminous plant, Narra, Pterocarpus indicus, nitrogen-fixing bacteria, Biology*

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2019,
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0184

Plant species diversity and assessment in Quezon Protected Landscape, Southern Luzon, Philippines

Tadosa, Edwin R. , Paclibar, Gicel Christ

Quezon Protected Landscape (QPL) is a tropical rainforest situated at the southern Sierra Madre mountain range. However, it is subjected to anthropogenic pressure that poses threats to its flora and fauna. This study was conducted to describe the plant diversity, assess their ecological and conservation status, and to identify current anthropogenic threats in various vegetation types in QPL. Vegetation assessment was done using quadrat method established at different land use types wherein ninety 10x10 m nested plots were used for trees, 5x5 m subplots were used for herbs and shrubs, and 1x1 m subplots were used for grasses. The study documented a total of 328 species belonging to 84 families and 208 genera with 2,737 individuals. Species diversity is high as revealed by the values obtained from species diversity (H') and species evenness (J') indexes. Out of 172 tree species identified, the most important species are: *Parashorea malaanonan* (Blanco) Merr. in the regenerating and lowland evergreen dipterocarp forest; *Diospyros pyrrhocarpa* Miq. in the karst forest; *Leucaena leucocephala* (Lam.) de Wit in the secondary forest; and *Cocos nucifera* L. in the agroforest. Assessment of ecological status showed that out of 328 species, 213 (64.94%) are native, wherein 65 (19.8%) are endemic, and 115 (35.06%) are introduced. Forty-five species (13.72%) are threatened in which 25 of those are endemic in the Philippines. Overall, QPL has a wide array of plant species and threats such as the illegal extraction of natural resources, encroachment, cleanliness and presence of invasive alien species. So, it is recommended that protection and awareness campaign should be done for conservation and sustainability. **(Author's abstract)**

Keywords: *Importance Value Index, Invasive species, Species diversity, Threatened species, Vegetation analysis, Biology*

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0185

Pre-blanching corn and pressurization effects on the physicochemical and microbiological qualities of corn milk

Sangkam, Jintanaporn , Apichartsrangkoon, Arunee , Baipong, Sasitorn , Sriwattana, Sujinda , Tiampakdee, Autchara , Sintuya, Panlop

A corn milk was developed by pre-blanching corn with drinking water at either 70 or 80°C, and the blanching water was used to extract the blanched corn seeds for corn milk BC70 or BC80, respectively. The corn milk extract was subsequently pressurized at 300–500 MPa for 10–30 min at 30°C. Pressurized corn milk was then subjected to physicochemical and microbiological assessments for color, enzymatic activities, viscosity, microbial counts and flavor volatile components. The ΔE showed that pressure of 300 MPa–500 MPa had no effect on corn milk color, while heat induced marked change of ΔE which were visible. Moreover, pre-blanching corn and pressurization at 500 MPa increased inactivation of peroxidase, lipoxygenase and polyphenoloxidase >70–90% as well as the activity of trypsin inhibitor for >90%. Furthermore, BC80 following pressurization at 500 MPa/30 min led to more gelatinization of corn starch and increase viscosity. Additionally, BC80 following pressurization at 500 MPa for 20 and 30 min eliminated total microbes and bacilli. More volatile components from raw corn milk were retained in BC70 compared with BC80. Meanwhile, most volatiles present in BC80 were not associated with the raw corn milk, but were found with pre-blanching of the corn kernel. **(Author's abstract)**

Keywords: *Corn milk, High pressure, Pre-blanching corn, Enzyme activities, Zea mays convar. saccharata, Aroma volatiles, Biology*

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2019,
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0186

Prokaryotic Community Analysis of a Hyperalkaline Spring in the Philippines Using 16S rRNA Gene Clone Library Construction

Baculi, Ronan Q. , Lantican, Nacita B. , de los Reyes, III, Francis L. , Raymundo, Asuncion K.

The prokaryotic diversity associated with serpentinization-driven Manleluag Hyperalkaline (pH 11) Spring in Pangasinan, Philippines was investigated. DNA extracted directly from the sediment samples was used to construct clone libraries based on bacterial and archaeal 16S rRNA gene sequences. Phylogenetic analysis of 16S rRNA gene sequences from the clone library revealed that the clones were grouped into *Alphaproteobacteria*, *Betaproteobacteria*, *Gammaproteobacteria*, *Cyanobacteria*, *Bacteroidetes*, and *Firmicutes*. Analysis of the archaeal 16S rRNA clones revealed the presence of sequences associated with members of *Euryarchaeota* and *Thaumarchaeota*. Most of the sequences from *Euryarchaeota* were related to *Methanobacteria* and *Methanomicrobia*. Some clones show little affiliation with known taxa and may represent novel sequences of organisms adapted to the hyperalkaline conditions. The populations found suggest the type of metabolisms that drive this specific environment, which include ammonia oxidation, and hydrogen-based and methanogenic metabolisms. This study represents the first analysis of prokaryotic diversity from community DNA of a hyperalkaline environment in the Philippines. **(Author's abstract)**

Keywords: *16S rRNA gene sequence, Alkaliphiles, Hyperalkaline spring, Phylogenetic analysis, Serpentinization, Biology*

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2015 June,
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Fil (S) Q1 P55 144/1 2015

Raffia palm (*Raphia hookeri*) wine: Qualitative sugar profile, functional chemistry, and antidiabetic properties

Erukainure, Ochuko L. , Chukwuma, Chika I. , Islam, Md Shahidul

The effects of short-term fermentation on the sugar quality, functional chemistry, antioxidant and antidiabetic properties of Raffia palm (*Raphia hookeri*) wine were investigated. Palm wine samples were subjected to open air fermentation for 24 and 48 h. The samples showed significant ($p < 0.05$) antioxidant activities with little or no differences between the unfermented and fermented samples. There was a dose-dependent inhibitory effect on α -glucosidase, α -amylase and intestinal glucose absorption with increasing fermentation time. Both non-fermented and 24 h fermentation led to increased muscle glucose uptake in a dose-dependent manner. ¹H NMR spectroscopy showed the presence of allose, cellobiose, d-tagatose, fructose, galactitol, gluconic acid, rhamnose, sucrose, xylose and β -N-acetylglucosamine in the samples. FTIR spectroscopy showed the presence of alcohols, phenols, 1° and 2° amines and aromatics functional groups in all samples. Fermentation led to the addition of the functional group, bend alkenes. These results suggested that un-fermented and fermented Raffia palm wine may have antioxidant and antidiabetic properties. **(Author's abstract)**

Keywords: *Bend alkenes, Palm wine, Raphia hookeri, Type 2 diabetes, Biology*

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2019,
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F(S) TP248.65.F66 F66 n.30 201

Rapid assessment of epiphytic pteridophyte biodiversity in Mt. Apo Natural Park, North Cotabato Province, Philippines: a comparison of disturbed and undisturbed forests

Amoroso, Victor B. , Bretaña, Bryan Lloyd P. , Cano-Mangaoang,

Pteridophytes are potential indicators of climate change and environmental disturbances because of their sensitivity to the changes in the environment such as sunlight intensities and humidity levels. The study was conducted to document the species and compare the diversity of epiphytic pteridophytes in two sites—the undisturbed and disturbed areas of Mt. Apo Natural Park, North Cotabato Province in the Philippines. In each site, four stations were established, each with four 20 m × 20 m plots that are at least 20 m apart from each other. Between stations, at least 100 m was maintained. In this study, 102 species of epiphytic pteridophytes belonging to 33 genera and 14 families were identified. Seven species are lycophytes and 95 species are ferns. The number of species recorded represents 10 % of all species of pteridophytes in the Philippines. Polypodiaceae was the most dominant family consisting of 13 genera and 33 species. Among these, *Prosaptia* was the largest genus represented by nine species followed by *Selliguea* with five species. Based on the Species Importance Value (SIV), *Lindsaea pulchella* was the most abundant species in the area studied. Abundance of epiphytic pteridophytes vary between two sites but other parameters such as species richness, evenness, Shannon-Weiner and Simpson diversity indices showed no significant differences. There were three main assemblages of epiphytic pteridophytes based on species composition with 50% overall similarity. Of the 102 species identified, 11 were threatened which represent 6.08% of the total threatened pteridophytes of the Philippines. Noteworthy is the new species record of *Asplenium beccarianum* for the Philippines. Unique composition of epiphytic pteridophytes was evident and the results showed that Mt. Apo is an important location for the conservation of these communities. **(Author's abstract)**

Keywords: *Abundance, Asplenium beccarianum, Conservation, Phorophyte, Epiphyte, Biology*

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2020,

New record of *Phyllodiaptomus (Ctenodiaptomus) praedictus sulawensis* Alekseev & Vaillant, 2013 (Hexanauplia, Copepoda, Calanoida, Diaptomidae) in the Philippines (Luzon Island)

Dumont, Henri J. , Rizo, Eric Zeus C. , Igancio, Aezrile A. , Cuballes, John Kenneth V. , Lacaba, Justine Val Jade B. , Guinto, Shea Kathleen P., Han, Bo-Ping , Papa, Rey Donne

A study originally intended to update the taxonomy and distribution of calanoid copepods in selected freshwater ecosystems of Central Luzon has led to the discovery of a new record of *Phyllodiaptomus* Kiefer, 1936 in Candaba Swamp, Pampanga. Since 1979, the only calanoid copepods recorded from this area included *Filipinodiaptomus insulanus* (Wright S., 1928) and *Tropodiaptomus australis* Kiefer, 1936. Later studies on calanoid copepods in the region have since been non-existent. Analyses of pertinent key morphological characters revealed that the specimens at hand belonged to *Phyllodiaptomus (Ctenodiaptomus) praedictus sulawensis* Alekseev & Vaillant, 2013, a freshwater diaptomid calanoid copepod subspecies discovered and known to be endemic only in Indonesia. Provided in this paper are baseline information on the morphological characters of the Philippine members of the subspecies accompanied by line drawings as well as a comparison between the recorded morphological data presented by Alekseev, Haffner, Vaillant & Yusoff (2013) and the current dataset to support the identification of the specimen. The discovery of *P. (C.) praedictus sulawensis* in the Philippines, which was thought to be endemic in Indonesia, presents a new record of this species in the country and the first such record outside of its country of origin. (Author's abstract)

Keywords: *Candaba Swamp, Copepod, Indonesia, Inland Waters, Limnology, Thailand, Biology*

Records of corticolous myxomycetes from selected trees in Angat Watershed Forest Reserve, Bulacan, Philippines

dela Cruz, Thomas Edison E. , Policina, Mon

Corticolous myxomycetes are a specialized guild of myxomycetes thriving on the bark of living trees. In this study, we explored the bark-inhabiting myxomycetes from selected trees in the Angat Watershed Forest Reserve, Bulacan, Philippines. Pieces of dead tree barks were carefully removed from selected mature trees - *Gmelina arborea* (“gmelina” or “yemane”), *Mangifera indica* (“mango”), *Parkia timoriana* (“kupang”), *Pinus* sp. (“pine tree”), *Pterocarpus indicus* (“narra”), *Samanea saman* (“acacia” or “rain tree”), and *Shorea contorta* (“white lauan”), within the accessible forest area and used for the preparation of moist chamber culture. Following incubation for 8–12 weeks, fruiting bodies from the moist chambers were identified. Results showed a total of 17 species belonging to 10 genera from five orders. The identified corticolous myxomycetes were *Arcyria cinerea*, *A. denudata*, *Comatricha pulchella*, *C. tenerrima*, *Cribraria microcarpa*, *C. violacea*, *Diderma effusum*, *D. hemisphaericum*, *Hemitrichia pardina*, *Lamproderma scintillans*, *Licea operculata*, *Licea* sp.1, *Perichaena chrysosperma*, *P. pedata*, *Physarum album*, *P. leucophaeum*, and *Trichia decipiens*. This is the first report of corticolous myxomycetes in the Angat Watershed Forest Reserve. (Author's abstract)

Keywords: *Bark, Moist chamber culture, Paleotropics, Plasmodial slime molds, Species list, Biology*

Records of cosmopolitan myxomycetes occurring on banana litter from Southern Mindanao, Philippines

Pantog, Athea Mohidda M. , Labas, Datutie A. , Abubakar, Tarhata A. , Farid, Tasmera O. , Balabagan, Nof A. , Pandulo, Almera D. , Pasandalan, Zohaina M. , Buisan, Prince Nur-Hakeem N., Dagamac, Nikki Heherson

Banana leaf litter as a microhabitat for cosmopolitan myxomycetes has never been studied in the Philippines. Since Southern Mindanao hosts a number of local banana plantations, ground leaf litters and pseudostems were randomly collected to set up moist chamber cultures that eventually yielded plasmodial or fruiting body records. Fructifications were observed from moist chambers containing the litters from the pseudostem. Five species are reported for this study namely, *Arcyria cinerea*, *Didymium nigripes*, *Didymium squamulosum*, *Perichaena depressa*, and *Perichaena vermicularis*. This record calls for comprehensive investigation of agricultural plantations in the country for possible substrate association of myxomycetes. (Author's abstract)

Keywords: *Indigenous crops, Maguindanao, Mycology, North Cotabato, Plasmodia, Biology*

New records of *Rosenvingea* (Scytosiphonaceae, Phaeophyceae) from the Philippines

Santiañez, Wilfred John E., West, John

We describe herein the morpho-anatomy of the elusive brown alga *Rosenvingea nhatrangensis* (Scytosiphonaceae, Phaeophyceae) and add this species to the flora of both the Philippines and Malaysia. At present, only two *Rosenvingea* species (*R. intricata* and *R. orientalis*) have been reported from both localities. We also report on the occurrence of *R. australis* in central Philippines based on molecular phylogenetic data, thus extending its distribution to the northern Pacific. First time account of the morphology of *R. australis* sporophyte under culture conditions is also provided. (Author's abstract)

Keywords: *Biodiversity, Brown algae, Malaysia, Rosenvingea australis, Rosenvingea nhatrangensis, Taxonomy, Biology*

Redox regulation of tyrosine kinase signalling: more than meets the eye

Dustin, Christopher M , Heppner, David E , Lin, Miao-Chong J , der Vliet, Albert van

Protein kinases are essential mediators of cellular signal transduction and are often dysregulated in disease. Among these, protein tyrosine kinases (PTKs) have received specific interest due to their common roles in various diseases including cancer, and emerging observations indicating that PTK signalling pathways are susceptible to regulation by reactive oxygen species (ROS), which are also frequently implicated in disease pathology. While it is well recognized that ROS can impact on tyrosine kinase signalling by inhibiting tyrosine phosphatases, more recent studies highlight additional modes of redox-based regulation of tyrosine kinase signalling by direct redox modification of non-catalytic cysteines within tyrosine kinases or other protein components of this signalling pathway. In this review, we will present recent advancements with respect to redox-based mechanisms in regulating PTK signalling, with a specific focus on recent studies demonstrating direct redox regulation of Src-family kinases and epidermal growth factor receptor kinases. Importantly, redox-based modulation of tyrosine kinases may be relevant for many other kinases and has implications for current approaches to develop pharmacological inhibitors for these proteins. **(Author's abstract)**

Keywords: *Redox, Cysteine, Src, EGFR, NOX, Biology*

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0194

The Regenerating Forest of Magbukún Aeta in Morong, Bataan, Philippines: A Biological Hotspot for Protection and Conservation

Cuevas, Virginia C. , Galias, Dean Ca

This research focused on the study of a tropical semi-evergreen rain forest community structure within the ancestral domain of the Aetas in Morong, Bataan. Point-Centered Quarter Method (PCQM) was used where five 200 m transects were laid across a 28-ha study site. Trees with ≥ 1 cm diameter at 1.3 m from the ground (diameter at breast height [DBH]) were sampled. Trees encountered were categorized into four groups: seedlings, saplings, pole trees and standard trees based on girth classes. A total of 76 tree species belonging to 61 genera and 35 families were recorded. The most represented family was Moraceae, followed by Dipterocarpaceae, Sapindaceae and Lauraceae. The species with highest importance percentage (IP) were *Shorea contorta* Vidal (Dipterocarpaceae) (IP=9.731), *Macaranga tanarius* (L.) Muell.-Arg. (Euphorbiaceae) (IP= 5.659) and *Canarium europhyllum* G. Perkins (Burseraceae) (IP= 4.538). Very high values of species diversity were calculated ($H' = 3.817$; $D' = 0.968$). The area was previously a dipterocarp forest and can now be classified as a young regenerating forest, composed primarily of seedlings many of which are dipterocarps. There were 17 threatened species, including two critically endangered and two endangered species (listed in The IUCN Red List of Threatened Species (2017-3) and DAO (2017-11) as well as twelve endemic species identified as present in the area. This forest is a biological hotspot that needs utmost protection and conservation. (Author's abstract)

Keywords: *Ancestral domain, Endemic, PCQM, Threatened species, Tree diversity, Biology*

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0195

Response of three cacao (*Theobroma cacao* L.) varieties to biochar and microbial inoculation

, Aggangan, Nelly S.

The study determined the influence of biochar and arbuscular mycorrhizal fungi (AMF) on the survival, growth and yield of three grafted cacao varieties planted under an agroforestry ecosystem in Barangay Mabacan, Calauan, Laguna. Plants were inoculated with AMF inoculant MYKORICH® (MR) without or with 15% bamboo biochar (15% BB). Results showed that K1 cacao variety treated with MR+15% BB had the highest height increment as compared to other treatments 1-2 yr after field planting but was outgrown by MR treatment alone after 3 yr. The highest stem diameter was also observed in MR+15% BB and MR inoculated K1 variety on the first and third year, respectively. MR treatment also consistently gave the highest plant survival in UF18 and K2 varieties (100% and 87%, respectively) throughout the 3 yr experiment. The highest mycorrhizal spore count and nitrogen-fixing bacteria was obtained in UF18 when treated with MR alone. The results also showed that soil amendment with MR alone improved the survival and rhizosphere microbial population of grafted cacao especially its association with K1 grown under acidic and drought-prone agroforest ecosystem. This practice of adding biochar and biofertilizers, either alone or in combination, can be applied in other agricultural farming system in the country.

Keywords: *acidic soil, grafted cacao, Theobroma cacao L., beneficial microbes, Philippines, microbial inoculation, biochar, arbuscular mycorrhizal fungi, Biology*

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0196

Review of the Philippine *Chalybion* Dahlbom, 1843 with descriptions of two new species and one new distributional record

Lit, Jr., Ireneo L., Abenis, Krist

Two species, *Chalybion clarebaltazarae* sp. nov., and *Chalybion stephenreyesi* sp. nov., are described as new to science on the basis of their placoid pattern and shape of genitalia. *Chalybion japonicum* (Griboldo, 1882) is also hereby reported as a new record for the Philippines. (Author's abstract)

Keywords: *Sceliphirini, Chalybion clarebaltazarae, Chalybion stephenreyesi, Chalybion japonicum, Biology*

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NP

0197

Review of the Philippine taxa formerly assigned to the Genus *Amphicnemis* Selys. Part III. Genus *Pericnemis*: *Bonita*- and *Incallida*- groups with descriptions of four new species (Odonata: Coenagrionidae)

Villanueva, Reagan Joseph T., Dow, Rory

The species formerly assigned to the genus *Amphicnemis* Selys, 1863 in the Philippines are reviewed. The present paper is the third of a series and deals with the species transferred to the genus *Pericnemis* Hagen in Selys, 1863. Specimens used in the study are all deposited in museums collections. The bonita- and incallida-groups of

Pericnemis from the Philippines are characterized. A key to species groups within Pericnemis is given, and also a key to the males of the bonita- and incallida-groups. The bonita-group includes five species: *P. bonita* Needham & Gyger, 1939, *P. flavicornis* Needham & Gyger, 1939, *P. bisaya* spec. nov., *P. gili* spec. nov. and *P. muragbonita* spec. nov. The incallida-group includes two species: *P. incallida* Needham & Gyger, 1939 and *P. yakal* spec. nov. Descriptions and illustrations are provided of both sexes of all species. (Author's abstract)

Keywords: *Zygoptera, Biodiversity, Taxonomy, Philippines, Biology*

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0198

Revisiting the aquatic phycomycete biota of the Douglas Lake region since the time of Dogma and Sparrow

James, Timothy Y. , Quandt, C. Alisha , Simmons, D. Rabern , JerÁ'nimo, Gustavo Henrique , Davis, Will

Fredrick K. Sparrow and his students, including Irineo J. Dogma, conducted many surveys of the aquatic phycomycete biota of the Douglas Lake region in Michigan, United States of America. Following the tradition of Sparrow and Dogma, we undertook an inventory of the aquatic phycomycete biota of the Douglas Lake region with an emphasis on Chytridiomycota. Cognizant of the difficulties of relying solely on light microscopy, we used a combination of light microscopy, culturing, and single cell techniques. We observed a total of 42 taxa. We successfully cultured *Terramycetaceae* sp., *Physocladia obscura*, and *Rhizoclostridium globosum*. Using single cell techniques, we obtained molecular sequence data for *Rhopalophlyctis sarcoptoides*, *Rhizophydium echinocystoides* and an unidentified parasite of *Desmidium*. Our inferred maximum likelihood phylogeny placed *Rhopalophlyctis sarcoptoides* in the Chytridiales as sister to *Chytrium hyalinus*. *Rhizophydium echinocystoides* was placed in the Rhizophydiales but did not group with the type of the genus. The unidentified parasite of *Desmidium* surprisingly grouped with members of *Synchytrium*. Our results provide a pilot study for demonstrating how light microscopy, culturing, and single cell techniques to obtain molecular sequences of chytrid taxa could be used to create a local aquatic fungal inventory based on molecular techniques, discover novel taxa, and potentially revise current taxonomy. (Author's abstract)

Keywords: *Chytridiomycota, Single cell, Smith's Fen, Bryant's Bog, Biology*

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NP

0199

Seedling growth and mineral uptake of *Eucalyptus pellita* with different mycorrhizal inoculants in Central Kalimantan, Indonesia *, Moon, Heung-Kyu*

This study was conducted to examine the response of *Eucalyptus pellita* cuttings to different mycorrhizal inoculants from the Philippines as compared with ectomycorrhizal fungi collected under *E. pellita* plantations in Kalimantan, Indonesia. Shoot tips (2-3 inches) of eucalypts were collected from the seedlings orchard, dipped in rooting hormone, inserted in rooting materials and then incubated under mist system. After 2 wk, the rooted cuttings were transferred into containers filled with soil. During seedling transfer to individual container, they were inoculated with the following mycorrhizal inoculants: KTH (contains spores of *Scleroderma* and *Pisolithus*

sp. native in Kalimantan, Indonesia), MYKOVAM®, MYKORICH®, MYKOCAP®, MYCOGROETM, MYCOGROETM+MYKORICH® and MYKORICH®+MYKOCAP® from the Philippines following the recommended dosages as stated in the label. Results showed that Mykocap® and MYCOGROETM+MYKORICH® inoculated plants were 51 and 49%, respectively, taller than the control (8.86 cm). In terms of mineral components, highest total plant N, K, Mg, Fe, and Mn uptakes were observed in plants inoculated with MYCOGROETM+MYKORICH®. MYKORICH® alone gave the highest percent increase in total plant uptakes of B (86%), Cu (76%) and Zn (104%). The results clearly showed that growth and mineral composition of *E. pellita* were greatly improved by inoculation with mycorrhizal fungi particularly by MYCOGROETM+MYKORICH®, which is a combination of ectomycorrhiza and arbuscular mycorrhizal fungi.

Keywords: arbuscular mycorrhizal fungi, ectomycorrhizal fungi, mineral elements, *Eucalyptus pellita*, *Scleroderma* sp., *Pisolithus* sp., seedling growth, mineral uptake, Biology

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0200

Selenoprotein P as a significant regulator of pancreatic β cell function

Saito, Yoshiro

Selenoprotein P (SeP; encoded by SELENOP) is selenium (Se)-rich plasma protein that is mainly produced in the liver. SeP functions as a Se-transport protein to deliver Se from the liver to other tissues, such as the brain and testis. The protein plays a pivotal role in Se metabolism and antioxidative defense, and it has been identified as a ‘hepatokine’ that causes insulin resistance in type 2 diabetes. SeP levels are increased in type 2 diabetes patients, and excess SeP impairs insulin signalling, promoting insulin resistance. Furthermore, increased levels of SeP disturb the functioning of pancreatic β cells and inhibit insulin secretion. This review focuses on the biological function of SeP and the molecular mechanisms associated with the adverse effects of excess SeP on pancreatic β cells’ function, particularly with respect to redox reactions. Interactions between the liver and pancreas are also discussed. **(Author's abstract)**

Keywords: Hepatokine, Insulin secretion, Pancreatic#946, Cell, Selenium, Selenoprotein P, Biology

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0201

Sexual dimorphism of invasive knifefish (*Chitala ornata*) in Laguna de bay, Philippines

Camacho, Ma. Vivian C. , Gonzales, Jon Carlo B. , Castro, Jhon Mich

Chitala ornata (J.E. Gray) (Osteoglossiformes: Notopteridae) has since established abundant and nuisance populations in Laguna de Bay. A fundamental prerequisite for the development of management strategies for invasive species like *C. ornata* is a full understanding of its life history characteristics including sexual dimorphism. In the present study, we examined the sexual dimorphism of *C. ornata*. Sexes of *C. ornata* can be distinguished through the examination of its genital papilla wherein females show distinct morphological adaptations for effective oviposition on a spawning substrate. Comparison of means and multivariate analysis of several morphometric characters showed that sexual size dimorphism in *C. ornata* is female-biased which is

mainly attributed to the disparity of resource expenditure between sexes for reproduction and size-dependent advantages of females in the production of more progenies with better chances of survival. (Author's abstract)

Keywords: *Genital papilla, Invasive species, Principal Component Analysis, Sexual size dimorphism, Teleost, Biology*

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0202

Siderophores of fungi from Lipa clay loam soil, Philippines
Organo, Nolissa D. , Pangga, Ireneo B. , Guerrero, Jonathan Jaime G., Dalisay, Teresita

This research was conducted to isolate culturable soil-borne fungi from Lipa clay loam soil and identify the types of siderophores they produce. The frequency of fungal isolates was likewise compared across the soil strata. Soil samples were plated on Rose Bengal Agar (RBA) and incubated for five days. Morpho-culturally unique isolates were transferred in Potato Dextrose Agar (PDA) slants and identified using taxonomic keys and by ITS sequencing. Siderophores of each species were then characterized through colorimetric methods. Twenty-nine species of fungi were identified. Six isolates were Basidiomycetes, 1 Zygomycetes and 22 Ascomycetes. Among ascomycetes, two were teleomorphs: *Chaetomium globosum* Kunze and *Emericella nidulans* (Eidam) Vuillemin. Isolates were then characterized in terms of their ability to produce siderophores. Majority produced hydroxamate type of siderophores while only *Aspergillus tamarii* Kita produced all three types of siderophores. Six other species failed to produce any of the three types. Isolates may further be studied for their metal remediating capacity and other biological activities. (Author's abstract)

Keywords: *Chaetomium globosum, Emericella nidulans, Lipa clay loam soil, Siderophores, Soil-borne fungi, Biology*

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0203

Species listing and distribution of macrofungi in Consocep Mountain Resort, Tigaon and Mount Isarog National Park, Goa, Camarines Sur

Mendiola, Julianne Paula L. , Pineda, Patricia B. , Gardaya, Reyzen Francis P. , Ilagan, Josh Patrick N. , Gamboa, Alissa Jane R. , Elsisura, Rjan Nichole Marie S. , David, Bjorn Adrian P. , Paguirigan, Jaycee Augusto G., Samelin, River N. , Pangilinan, Ma. Victo

The Philippines is known for its environmental diversity due to its ideal climatic conditions. Scientists have studied various species of flora and fauna in the country, including macrofungi. However, not all regions have been studied and explored for macrofungi such as Mount Isarog in Camarines Sur. To add to Philippine macrofungal diversity, this study accounted for naturally occurring macrofungi collected in April 2018 at Consocep Mountain Resort in Tigaon and Mount Isarog National Park in Goa, Camarines Sur. The samples collected were identified based on their morpho-anatomical characteristics, as well as their substrate with the aid of published taxonomic keys. A total of 36 taxa were identified from the two sites and classified under eight orders, 17 families, and 26 genera. Order Polyporales had the most number of specimens. The number of species

provided evidence for the high diversity of macrofungal species in the area with most of them attached to bark substrates. (Author's abstract)

Keywords: *Ascomycetes, Basidiomycetes, Mycology, Philippines, Taxonomy, Biology*

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NP

0204

New species of *Sphagnum* from the Philippines with remarkable morphological characters

Mishler, Brent D. , Ignatova, Elena A. , Ignatov, Michael S. , Nosratinia, Sonia , Tan, Ben

Sphagnum apopenneysii B.C. Tan, Ignatov, Ignatova, & B. Mishler is described as a species new to science. It was found submerged in a high mountain lake, at 2385 m elev. on Mt. Apo on Mindanao island in the Philippines. The new species is peculiar in its poor expression of leaf cell dimorphism. Cells in the upper half of the branch leaves are all identical, linear-vermicular, and all have chloroplasts and nuclei. In the mid-leaf, a moderate differentiation in shape appears with larger cells, approaching in shape to hyalocysts, yet still containing chlorophyll. Only near the base of the branch leaves is a pattern common to most *Sphagnum* species observed, including inflated hyalocysts with fibrils, albeit without any pores. Collections from deeper water have long lanceolate leaves, while plants from shallower water have stem leaves that are ovate-triangular, similar to those in many species of *Sphagnum* in section *Cuspidata*. Both nuclear and plastid DNA sequence data support the placement of this new moss in section *Cuspidata*. (Author's abstract)

Keywords: *Sphagnum apopenneysii, Sphagnum sect. Cuspidata, Chlorocyst, Hyalocyst, Biology*

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NP

0205

Spikemoss flora (*Selaginella*) in Mindanao Island, the Philippines: species composition and phenetic analysis of morphological variations

Acma, Florfe M. , Bautista, Majella G., Coritico, Fulgent P. , Amoroso, Victor

The genus *Selaginella*, commonly referred to as spikemosses, is an important component of the Philippines' lycophytes diversity. Mountain ecosystems in Mindanao island hold diverse species of lycophytes, however the morpho-taxonomy diversity of this group is poorly documented there. The study aimed to determine *Selaginella* species richness, distribution and phenetic relationships based on morphological characteristics in Mindanao island. Specimens of *Selaginella* were collected in Mt. Apo, Kidapawan City; Mt. Hamiguitan, Davao Oriental; Mt. Kiamo, Mt. Kitanglad, Mt. Musuan and Mt. Limbawon in Bukidnon; Mt. Timpoong, Camiguin; and Mt. Malindang, Misamis Occidental. The 24 *Selaginella* species were collected and subjected to numerical phenetic analysis using the PC-ORD program. A total of 11 morphological characters and 44 character states were used in the analyses. Of the 24 species, seven are Philippine endemics, four are potential new species and two species are widely distributed in the areas studied. Results of the phenetic analysis showed four major clusters. (Author's abstract)

Keywords: *Endemic species, Lycopods, Philippines, Selaginellaceae, Taxonomy, Biology*

Spore production and root colonization of arbuscular mycorrhizal fungi in different media and levels of biochar: their effect on growth of *Paspalum notatum*

, Aggangan, Nelly S.

Bahiagrass (*Paspalum notatum*) is commonly used in the mass production of arbuscular mycorrhizal fungal inoculants containing infective propagules, mycorrhizal roots and spores, and the growing medium. This study was conducted to determine the best growing medium and biochar level from bamboo (BB) trimmings and sugarcane bagasse (BSB) that promote high mycorrhizal spore count and colonized roots. Two mycorrhizal inoculants, endoROOTS® (Made in USA) and MYKORICH® (Philippines product), were used in this experiment. endoROOTS® consists of nine mycorrhizal species mostly *Glomus* while MYKORICH® consists of 12 species belonging to genera *Glomus*, *Gigaspora*, *Acaulospora*, and *Entrophospora*. Media used were oven sterilized sand (S), sand+vermiculite (SV), sand+coir dust (SCD), and sand+coir dust+vermiculite (SCDV) coded as S, SV, SCD, and SVCD, respectively. The levels of biochar were: 0, 3.75, 7.5, 15, and 30% (w/w). Seedlings were inoculated with the recommended dosages as stated in the label. Inoculation was done during transplanting of 3-wk old pregerminated bahiagrass from seed germination boxes to plastic cups (five seedlings per cup) filled with the different media amended with increasing level of biochar. After 4 mo in the screenhouse, MYKORICH® gave 124 spores per g (spg) in the presence of 7.5% BSB, 176 spg in 7.5% BB, 250 spg in 3.75% BB amended sand, and almost 300 spg in no biochar sand. Ninety percent more spores were produced by MYKORICH® than endoROOTS®. endoROOTS® gave the highest (163 spg inoculant) spore count in no biochar sand. MYKORICH® inoculated plants gave heavier biomass in BB amended sand, SV, and SVCD than in BSB amended counterpart. endoROOTS® produced more root biomass in BSB amended sand, SVCD, and SV media. SCD was not a good medium for mycorrhizal inoculant.

Keywords: *Biology, mycorrhizal inoculants, mixed inoculant, Glomous, Gigaspora, Acaulospora, Entrophospora, bahiagrass, Paspalum notatum*

Stirring rate affects thermodynamics and unfolding kinetics in isothermal titration calorimetry

Maruno, Takahiro , Ohkubo, Tadayasu , Uchiyama, Susumu

Isothermal titration calorimetry (ITC) directly provides thermodynamic parameters depicting the energetics of intermolecular interactions in solution. During ITC experiments, a titration syringe with a paddle is continuously rotating to promote a homogeneous mixing. Here, we clarified that the shape of the paddles (flat, corkscrew and small-pitched corkscrew) and the stirring rates influence on the thermodynamic parameters of protein–ligand interaction. Stirring with the flat paddle at lower and higher rate both yielded a lower exothermic heat due to different reasons. The complete reaction with no incompetent fractions was achieved only when the stirring was performed at 500 or 750 rpm using the small-pitched corkscrew paddle. The evaluation of the protein solution after 1,500 rpm stirring indicated that proteins in the soluble fraction decreased to 94% of the initial amount,

among which 6% was at an unfolded state. In addition, a significant increase of micron aggregates was confirmed. Furthermore, a new approach for the determination of the unfolding kinetics based on the time dependence of the total reaction heat was developed. This study demonstrates that a proper stirring rate and paddle shape are essential for the reliable estimation of thermodynamic parameters in ITC experiments. **(Author's abstract)**

Keywords: *Binding thermodynamics, Isothermal titration calorimetry, Protein-ligand interaction, Stirring rate, Unfolding kinetics, Biology*

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0208

Sustainable marine conservation, baselines, and systematic monitoring - a few lessons from coastal resource management in the Philippines

White, A

This review shares lessons learned from the establishment of early marine protected areas (MPAs) in the Philippines about the need to establish baseline information, do systematic monitoring of the status of the marine environment, and to progress towards more integrated forms of management that involve key stakeholders in coastal areas. The tendency for human society to change its perception of what is “normal” through the phenomena of “shifting baselines” is pointed to as a reason why more concerted action is not taken to stop the downward trends of Philippine coastal resources and environment. The small MPAs of Apo, Sumilon and Olango Islands as well as the large Tubbataha Reefs Natural Park, are cited as examples of how the establishment of baselines and the implementation of effective monitoring over time for both biophysical and governance parameters, has been instrumental in maintaining and improving the quality of the marine environment and bringing benefits to people. The development of integrated coastal management and coastal resource management programs within local government units is explained as a way of harnessing local institutions to lead the way towards improved management and stewardship of coastal resources and provide tangible benefits to coastal communities. And, the role of national government is highlighted as a facilitator and a source of technical support to local governments in the implementation of marine conservation and coastal resources management. Finally, the significant influence of Dr. Angel Alcala in marine conservation in the Philippines is noted through his research and related conservation efforts for small-island and fisheries management and his mode of sharing results with local communities and governments so that they could learn from their own mistakes and successes and become better stewards of their resources. **(Author's abstract)**

Keywords: *Apo, Community, Coral reefs, Sumilon, Tourism, Tubbataha, Biology*

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(Filipiniana Analytics)
NP

0209

Taxonomy and new records of Graphidaceae lichens in Western Pangasinan, Northern Philippines

Bawingan, Paulina A. , Fajardo, Weena

There are limited studies on the diversity of Philippine lichenized fungi. This study collected and determined corticolous Graphidaceae from 38 collection sites in 10 municipalities of western Pangasinan province. The study

found 35 Graphidaceae species belonging to 11 genera. Graphis is the dominant genus with 19 species. Other species belong to the genera Allographa (3 species) Fissurina (3), Phaeographis (3), while Austrotrema, Chapsa, Diorygma, Dypolobia, Glyphis, Ocellularia, and Thelotrema had one species each. This taxonomic survey added 14 new records of Graphidaceae to the flora of western Pangasinan. (Author's abstract)

Keywords: *Lichenized fungi, Corticolous, Crustose lichens, Ostropales, Biology*

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2019,
(Filipiniana Analytics)
NP

0210

Ultrasound-Assisted Electrodisinfection Process for the Inactivation of *Escherichia coli* Biotech 1640 in Selected Crops

Sanchez, Leandro Angelo Miguel L. , Lit, Ma. Aussielita L.

The effectiveness of combined ultrasound and electrolyzed water treatment for the inactivation of *E. coli* in cherry tomato, lettuce, and cucumber was investigated and compared to its individual treatment to assess its practicality for industrial applications. "Ultrasound only" treatment was conducted at a fixed frequency (56 kHz) while "electrolyzed water only" treatment was conducted at varying TRO concentration (5 ppm, 10 ppm, 20 ppm). For "ultrasound + electrolyzed water" treatment, 10 ppm TRO concentration was used with 56 kHz ultrasonication. Results show that ultrasound enhanced the effectiveness of electrolyzed water wherein the log reduction increased up to 118% (2.49 log to 5.45 log), 130% (2.27 log to 5.23 log), and 124% (2.28 log to 5.12 log) for cherry tomato, lettuce, and cucumber, respectively. Moreover, for all produce types, the rate constants were highest in the combined ultrasound and electrolyzed water treatment. Comparison among the disinfection treatments showed ultrasound-assisted electrodisinfection as the most efficient treatment, but electrodisinfection only may be practical for cost effective industrial application. (Author's abstract)

Keywords: *Biology, Crops, Electrolyzed water, Escherichia coli, Food safety,, Ultrasonication*

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0211

A unique mechanism for thiolation of serum albumins by disulphide molecules

Nakashima, Fumie , Shibata, Takahiro , Uchida, Koji

Protein S-thiolation is a reversible oxidative modification that serves as an oxidative regulatory mechanism for certain enzymes and binding proteins with reactive cysteine residues. It is generally believed that the thiolation occurs at free sulphhydryl group of cysteine residues. Meanwhile, despite the fact that disulphide linkages, serving structural and energetic roles in proteins, are stable and inert to oxidative modification, a recent study shows that the thiolation could also occur at protein disulphide linkages when human serum albumin (HSA) was treated with disulphide molecules, such as cystine and homocystine. A chain reaction mechanism has been proposed for the thiolation at disulphide linkages, in which free cysteine (Cys34) is involved in the reaction with disulphide molecules to form free thiols (cysteine or homocysteine) that further react with protein disulphide linkages to form the thiolated cysteine residues in the protein. This review focuses on the recent finding of this unique chain reaction mechanism of protein thiolation. (Author's abstract)

Keywords: *Disulphide molecule, Protein thiolation, Serum albumin, Biology*

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2020 February,
(Filipiniana Analytics)
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0212

**The unusual biology of marine file snakes with a perspective for the conservation of
Acrochordus granulatus
Lillywhite, Har**

Biodiversity and the function of tropical shallow-water marine environments are threatened by numerous anthropogenic factors, especially climate change, overharvesting of resources, and destruction of habitat. Marine snakes are important components of coastal shallow-water systems and should be considered as indicators of the health of coastal ecosystems such as mangroves. *Acrochordid* snakes (Acrochordidae: *Acrochordus*) represent a highly distinct evolutionary lineage with unusual adaptations to shallow water habitats and importance to biodiversity of tropical coastal regions. One of three congeneric species, *Acrochordus granulatus* (file snake), is an interesting and common inhabitant of coastal estuaries and mangroves in the Philippines. This paper reviews unusual attributes of *A. granulatus* and provides a perspective for its conservation in coastal habitats. Morphological, physiological, and behavioral characters of this snake are specialized for life in shallow-water marine environments such as mangroves. Unusual and specialized features confer abilities for prolonged submergence and include low metabolic rate, large capacity for oxygen storage, cutaneous gas exchange, nearly complete utilization of oxygen stores during aerobic submergence, intracardiac and cutaneous shunts for regulating blood flow, and reclusive behavior. Fresh water is required for water balance, and file snakes are dependent on rainfall in many habitats where they drink from freshwater lenses formed by precipitation on the surfaces of marine water. File snakes feed largely on fishes and are candidates as bio-indicators of the health of shallow-water coastal habitats. Attention should be given to threatening insults on coastal environments including climate change, habitat destruction, harvesting of resources, and other factors in need of research, monitoring, and plans for abatement. Importantly, conservation can be promoted by educating people about the docile behavior, unusual traits, and interesting ecology of *A. granulatus*. (**Author's abstract**)

Keywords: *Mangrove, Shallow water, Acrochordidae, Little file snake, Conservation physiology, Ecophysiology, Biology*

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2020,
(Filipiniana Analytics)
NP

0213

**The use of epilithic diatom assemblages in assessing land use in Silago, Southern Leyte,
Philippines
Magbanua, Francis S. , Hernandez, Maria Brenda M. , Perez, Teresita R. , Vocal, Issa Carm**

Silago is a municipality in Southern Leyte in which logging for high-quality timber and land clearing for agricultural purposes threaten stream ecosystems. The objective of this study was to assess the response of diatom assemblages in relation to land use. Diatoms and water quality sampling was done at 27 sites on two sampling occasions (June and July 2014). Multiple diatom metrics were calculated to measure the response of diatoms to changes in land use. In all, 135 diatom species distributed to 48 genera were recorded. The results showed that

diatom species and their attributes gave similar responses to those obtained in environmental variables. Pollution tolerance index classified all sampling sites as oligo-b-mesosaprobic. Meanwhile, *Cymbella* richness, percent motile taxa, and percent *Achnanthyrium minutissimum* indicated good water quality in forested areas, distinguishing them from other land use types. Contrary to other studies, species richness was found to increase with greater degrees of disturbance, thus giving unreliable evaluation of water quality. Overall, the study suggests that epilithic diatoms can be applied in biomonitoring of freshwater bodies in the country. (Author's abstract)

Keywords: *Bioindicators, Biomonitoring, Community structures, Diatom attributes, Multimetric, Water quality, Biology*

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2018,
(Filipiniana Analytics)
NP

0214

Verification of antidiabetic potential of Aloe vera: a -amylase inhibitory assay of crude aloe gel and aloe latex with rind extracts<

Alcalde, Deanne , Tajo, Diane May , Valencia, Dyan Reizl

Aloe vera has been known to have antidiabetic potential. Some studies state that aloe vera is antidiabetic because of the aloe latex while some studies state that its antidiabetic property is exhibited by the aloe gel. This study aims to verify whether aloe vera latex with rind and aloe vera gel indeed have antidiabetic potential. This study used the -amylase assay in which the inhibition of maltose was measured using a spectrophotometer. The results show that both aloe gel and aloe latex with rind extracts have antidiabetic property. It is recommended that active antidiabetic constituents be isolated and undergo further analyses to determine which constituents have better potential to be used for drug development. (Author's abstract)

Keywords: *a -amylase inhibitory assay, Crude aloe gel, Aloe latex, Aloe vera, Biology*

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0215

***Vorticella* and *Colacium* as epibionts of copepods in Pasig river, Philippines**

Papa, Rey Donne S. , Dogma, Jr., Irineo J. , Mariano, Andrea Czarina P. , Irlanda, Marianne Therese S. , Arnaldo, Mark Nathaniel L. , Corre, Pia S., Abadilla, Mary Rose Clarence S

The chitinous exoskeleton of copepods serves as a scaffold for microepibionts such as protozoa. Although copepods are highly cosmopolitan, their associated epibionts in the tropics are poorly known. This study presents the first account in the Philippines of the ciliate *Vorticella* on calanoid copepod *Arctodiaptomus dorsalis* and both *Vorticella* and the euglenoid *Colacium* on the cyclopoid copepods *Thermocyclops crassus* and *Mesocyclops microlasius* in the Pasig River. Infestation, however, was low at 0.83% (108 out of 13,039) observed copepods from four collection sites in January-May and July-December 2018. Interestingly, *Vorticella* and *Colacium* were frequently observed in cyclopoid than on calanoid copepods, predominantly on the urosome, thorax, cephalosome of copepodites and adult stages of copepods. *Colacium* was also found attached on the antennules, swimming legs, caudal rami and setae. Prevalence of epibionts was site-related; *Vorticella* being more abundant in waters near Manila Bay (Site 1) where high salinity, conductivity and total dissolved solids were recorded while *Colacium* was found more near Laguna de Bay (Site 4). Both were abundantly present in September and absent

in May, due to increased inflow of seawater from Manila Bay. Nevertheless, overall low infestation resulted in neither significant spatial nor temporal variation of epibiosis in Pasig River, probably due to heavy loadings of wastewater from nearby tributaries, noticeable algal blooms, detachment of epibionts by predations and changes in water chemistry. (Author's abstract)

Keywords: *Protozoa, Zooplankton, Epibiosis, Biology*

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2020,
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NP

0216

What's in a latin name?: *Cycas wadei* & the politics of nomenclature *Gutierrez, Kathlee*

This history piece analyzes colonial-era correspondence and botany publications fascinated with *Cycas wadei*, a cycad observed only to grow on the island of Culion in the province of Palawan. First spotted in 1902 by U.S. botanist Elmer D. Merrill, the cycad became the preoccupation of U.S. and Filipino scientists alike. It took nearly three and a half decades before the species was introduced in the Philippine Journal of Science in 1936 as *C. wadei*, named after Herbert W. Wade, head physician of the Culion leper colony established by the U.S. colonial government at the turn of the century. Tracking the history of this species—from its first sighting to its debut before the international botany community—reveals much about the institutional workings of colonial science in the Philippines in the years leading up to the Commonwealth era. It further inspires us to take stock of the ways in which the politics of Latin binomial nomenclature of a species can be historicized across scales of human and institutional interaction. Such an intellectual practice can help us continue to shed light on the history of taxonomy in the Philippines. (Author's abstract)

Keywords: *Cycads, Taxonomy, Philippine history, Bureau of Science, U.S. colonialism, Biology*

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0217

X-ray dose-dependent structural changes of the [2Fe-2S] ferredoxin from *Chlamydomonas reinhardtii*

Ohnishi, Yusuke , Muraki, Norifumi , Kiyota, Daiki , Okumura, Hideo , Baba, Seiki , Kawano, Yoshiaki , Kumasaka, Takashi , Tanaka, Hideaki , Kurisu, Genji

Plant-type ferredoxin (Fd) is an electron transfer protein in chloroplast. Redox-dependent structural change of Fd controls its association with and dissociation from Fd-dependent enzymes. Among many X-ray structures of oxidized Fd have been reported so far, very likely a given number of them was partially reduced by strong X-ray. To understand the precise structural change between reduced and oxidized Fd, it is important to know whether the crystals of oxidized Fd may or may not be reduced during the X-ray experiment. We prepared the thin plate-shaped Fd crystals from *Chlamydomonas reinhardtii* and monitored its absorption spectra during experiment. Absorption spectra of oxidized Fd crystals were clearly changed to that of reduced form in an X-ray dose-dependent manner. In another independent experiment, the X-ray diffraction images obtained from different parts of one single crystal were sorted and merged to form two datasets with low and high X-ray doses. An Fo–Fo map calculated from the two datasets showed that X-ray reduction causes a small displacement of the iron atoms in the

[2Fe-2S] cluster. Both our spectroscopic and crystallographic studies confirm X-ray dose-dependent reduction of Fd, and suggest a structural basis for its initial reduction step especially in the core of the cluster. **(Author's abstract)**

Keywords: *Absorption spectroscopy, Ferredoxin, Protein-protein interaction, Redox-dependent structural change, X-ray crystallography, Biology*

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2020 June,
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0218

High yield of tetramethylpyrazine in functional Fuqu using bacillus amyloliquefaciens

Zhang, Wenqing, Si, Guanru, Rao, Zhiming, Li, Jinglei, Zhang, Xian, Mei, Jie, Wang, Jiasheng, Ye, Ming, Zhou, Ping

Fuqu is an important starter culture used for Chinese liquor brewing. And distillers' grains (DGS) are the main by-product of the Chinese liquor industry. Tetramethylpyrazine (TTMP) is an important functional substance and key characteristic aroma component in Chinese liquor. A strain with high TTMP yield was identified as *B. amyloliquefaciens* XJB-104 and used to produce TTMP using DGS as the medium for solid-state fermentation (SSF). The cultures after SSF were used as Fuqu with high TTMP. DGS could be used as a raw material, and the production process for high TTMP producing Fuqu was developed. TTMP production (1.28×10^3 mg/kg, 365 mg/kg/d) using SSF for 3.5 d was higher than any previous results. Using SSF with DGS may provide a low-cost and effective strategy to produce high TTMP Fuqu. **(Author's abstract)**

Keywords: *Distillers grains, Bacillus amyloliquefaciens, Tetramethylpyrazine, Fuqu, Chinese liquor, Jiuqu, Biology*

Food Bioscience, Volume No. Issue No. , 1-6
2019,
(Filipiniana Analytics)
F(S) TP248.65.F66 F66 n31 2019

BOTANY

0219

Control of browning in fresh-cut eggplant (*Solanum melongena* L.) using different anti-browning agents

, , Nuevo, Perlita A.,

The effectiveness of using various browning inhibitors commonly used in the local markets and commercially available sulfite substitutes on fresh-cut eggplant stored at ambient temperature was determined. Use of sodium metabisulfite (SMS) solution effectively delayed browning of eggplant slices. Optimization studies showed that SMS at 0.09% concentration is the most effective. Alternative agents generally regarded as safe (GRAS) such as ascorbic acid, citric acid, calcium chloride and oxalic acid were also tested. Individual applications of ascorbic acid (1%, 1.5% and 2%) and citric acid (1%) were not effective in delaying browning of fresh-cut eggplant. A combination of ascorbic acid (0.5%) with citric acid (0.5%) was not effective either, but higher concentrations can be used for further study. Oxalic acid at 0.5% and 1% concentrations resulted in peel color degradation and poor visual appearance of eggplant slices. Among the solutions tested, combination of ascorbic acid and calcium

chloride (0.5%) showed potential as browning inhibitor but was still a bit less effective than SMS. Considering health concerns and safety of the traders and consumers, this would be a better option. Higher concentrations might be needed for individual or combined application, or using other combinations at different concentrations can be subjected to further study.

Keywords: *anti-browning agents, fresh-cut eggplant, fresh-cuts, sodium metabisulfite, sulfite substitutes, Solanum melongena, Botany*

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2020,
(Filipiniana Analytics)

0220

Cultivar-specific SSR markers as revealed through fluorescence-labeling and capillary electrophoresis in sugarcane (*Saccharum hybrids* spp.)
, Luzaran, Rosalyn T.

Genetic diversity in sugarcane was investigated using 21 fluorescence-labeled polymorphic SSR markers and capillary electrophoresis system. Sixty-one sugarcane varieties from the Philippines were included in the study including 21 commercial cultivars with 13 parental materials and 20 new hybrids. A total of 199 alleles were amplified, of which 90.45% were polymorphic. Number of alleles recorded per primer pair ranged 3 to 16 with an average of 8.57. Some alleles were uniquely present or absent in a particular cultivar that can be used as cultivar-specific markers for rapid discrimination. The percentage of polymorphic bands (PPB) per primer pair varied from 72.72 to 100 % with an average of 92.07 %. The polymorphism information content (PIC) value ranged 0.19 to 0.89 with an average of 0.80. An unweighted pair group method analysis was used to cluster the 61 sugarcane varieties into two major and three minor groups, which were in agreement with the results of principal component analysis except for a few cultivars that were loosely distributed distantly from the larger group. Twenty SSR primer pairs generated fingerprint markers that are useful in identifying commercial cultivars and other wild relatives of sugarcane in the germplasm collection in the Philippines. The results can be extended by using additional SSR primer pairs. The information generated from this study can also be employed in seed cane production certification, seed contaminant identification, and distinguishing among cultivars with similar phenotype.

Keywords: *CE, fluorescence, hybrids, Saccharum spp, SSR, Botany*

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2020,
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0221

Hypocholesterolemic activity of mungbean 8S α globulin engineered with lactostatin
, , Medina, Mart Almer P. ,&n

Protein engineering has been the major tool in enhancing proteins and their functional properties throughout the years. Using this technology, the improvement of proteins of important food crops such as the major storage protein of mungbean (8S α globulin) was made possible. In this study, the 8S α globulin of mungbean was engineered with the hypocholesterolemic peptide called lactostatin (originally derived from bovine β -lactoglobulin) with the sequence I-I-A-E-K (Ile-Ile-Ala-Glu-Lys), through substitution mutation, specifically

using site-directed mutagenesis approach. Initially, in silico approach was done in order to design models for the wild type (WT) and the mutant mungbean 8 α globulin protein for comparison purposes and this preliminary approach checked that the mutation plotted to the mungbean 8 α globulin gene is stable considering the relationship between the protein's structure and function. After the mutation, the mutated gene in pET21d vector was transformed and expressed in *E. coli* BL21 (DE3) cells. The average total protein concentration attained in WT and mutant 8 α globulins were $746.36 \pm 5.71 \mu\text{g mL}^{-1}$ and $1066.02 \pm 3.76 \mu\text{g mL}^{-1}$, respectively. Based on the densitometric analysis, the expression of the mutant 8 α globulin is slightly higher than the wild type 8 α globulin. Hydrophobic Interaction Chromatography (HIC) was used to purify the WT and mutant 8 α globulin, which were later on digested using trypsin and chymotrypsin enzymes at different hours interval. Peptide mapping and detection using Liquid Chromatography–Mass Spectrometry (LC-MS) revealed the successful recombinant production, expression and release of the IIAEK peptide from the mutated mungbean 8 α globulin. The percent (%) reduction of bound sodium taurocholate of HIC purified WT and HIC purified mutant 8 α globulin were $31.62 \pm 0.56 - 33.49 \pm 1.62$; and $27.54 \pm 1.82 - 40.29 \pm 6.29$, respectively. Results showed significant difference on the activity of the HIC-purified mutant protein between hours digests, and the maximum % bile-acid reduction was observed in the 24th hr digest of the HIC purified mutant 8 α globulin (40.29 ± 6.29), indicating the presence of the hypocholesterolemic activity of the released target peptide.

Keywords: hypocholesterolemic, lactostatin, protein engineering, site-directed mutagenesis, 8 α globulin, mungbean, Botany

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CHEMISTRY

0222

Antioxidant activity and phytochemical screening of the methanol, ethyl acetate, and hexane extracts of *Lansium domesticum* seeds

Andonaque, Adriel Noel, Dorado, Novie, Ledesma, Kyle Jeremiah, Manalo, Lauren

This study intended to conduct a qualitative phytochemical test and an antioxidant assay on *Lansium domesticum* seeds grown in the Philippines. The seeds were extracted through maceration in methanol, ethyl acetate, and hexane. The antioxidant activity of the seeds were tested by measuring the absorbance of the free radical, 2,2'-azinobis[3-ethylbenzothiazoline-6-sulfonate) or ABTS through the use of a UV / Vis spectrophotometer. The results were measured in % free radical scavenging activity, using 2% [g/ml] Vitamin C in distilled water as the positive control. **(Author's abstract)**

Keywords: *Lansium domesticum*, Methanol, Ethyl acetate, Hexane, Chemistry

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0223

Assessment of the Combination of Anthocyanin and Quercetin as an Angiogenic Inhibitor through a Chick Embryo Chorioallantoic Membrane Assay

Sombiro, Alexandria Marie, Valdestamon, Daphine Di, Aguirre, Kyle Dominic, Mediodia, Harold

Angiogenesis is a normal physiological process where new capillary branches sprout from preexisting blood vessels. Excessive angiogenesis can lead to the development of cancer, atherosclerosis, rheumatoid arthritis, etc. Anthocyanin is known for inhibiting angiogenesis in human endothelial cells. Quercetin has also shown an inhibitory effect when it was administered to the chorioallantoic membrane of chicken eggs. However, it has been proven that single flavonoids are less effective compared to when they are combined. This study aimed to assess the combined effect of anthocyanin and quercetin in inhibiting blood vessel growth in a chick embryo chorioallantoic membrane. Anthocyanin, quercetin, and their combination were each prepared with a concentration of 15 mg/ L. The treatments were administered to seven-day-old chicken eggs and dimethyl sulfoxide served as the positive control. The appearance of each chorioallantoic membrane was evaluated using the software ImageJ through calculation of fractal dimension values three days after the treatments were introduced. The values were then statistically analyzed through Kruskal-Wallis where it was found out that there was no significant difference between all treatments when compared to the controls. Of the three flavonoid treatments, the combination of anthocyanin and quercetin appeared to be the most effective in reducing blood vessel growth. This shows that the combination of anthocyanin and quercetin is more efficient in inhibiting angiogenesis. This treatment could be a novel source of treating pathological angiogenesis. **(Author's abstract)**

Keywords: *Angiogenesis, Flavonoids, Anthocyanin, Chemistry*

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0224

Bio-Enzymatic Degradation with Pectinase Enzyme and Activators of UV-Irradiated Low-Density Polyethylene (LDPE)

Bastareche, Regine , Catolico, Joan , Secular, Matt Andrew , Larroder, Aris

Low-density polyethylene (LOPE), classified as plastic number four, is a kind of plastic with long degradation period, low recyclability potential, and is harmful to marine habitats. Due to this, LDPE plastic strips were subjected to treatments that can hasten its degradation. They were irradiated to ultraviolet for 14 days. Bio-enzymatic degradation was then conducted using pectinase enzyme with barium, magnesium, and calcium ions as activators. The assessments for the degradation were in terms of weight loss and carbonyl index of the LOPE strips. The pectinase with magnesium activator is the most effective treatment as it was able to show a significant difference with the two parameters. **(Author's abstract)**

Keywords: *Pectinase Enzyme, UV-Irradiated Low-Density Polyethylene (LDPE), High-Density Polyethylene, Chemistry*

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0225

Circ_0000218 plays a carcinogenic role in colorectal cancer progression by regulating miR-139-3p/RAB1A axis

Pei, Fu-Lai , Cao, Ming-Zheng , Li, Yue-Feng

Accumulating researches have confirmed that circRNA abnormal expression plays a prominent role in the progression of colorectal cancer (CRC). The role of circ_0000218 in CRC and its potential mechanism are not clear. In this study, real-time polymerase chain reaction (RT-PCR) was employed to measure the circ_0000218, miR-139-3p and RAB1A mRNA expression in CRC tissues and cells. Immunohistochemistry and western blot were conducted to determine the RAB1A expression in CRC tissues and cells, respectively. Colony formation assay and BrdU method were employed to monitor the effect of circ_0000218 on cell proliferation. Transwell assay was adopted to detect cell migration and invasion. Dual luciferase reporter assay and RNA immunoprecipitation assay were adopted to confirm the targeting relationship between circ_0000218 and miR-139-3p, miR-139-3p and RAB1A. We demonstrated that circ_0000218 was notably upregulated in CRC tissues and cell lines, and its high expression level was markedly linked to the increase of T staging and local lymph node metastasis. Circ_0000218 overexpression enhanced the proliferation and metastasis of CRC cells while knocking down circ_0000218 caused the opposite effects. We also observed that miR-139-3p was negatively regulated by circ_0000218, while RAB1A was positively regulated by it. Collectively, this study suggested that circ_0000218 upregulated RAB1A and promoted CRC proliferation and metastasis via sponging miR-139-3p. **(Author's abstract)**

Keywords: *Deuterium, Circ_0000218, CRC, miR-139-3p, RAB1A, Chemistry*

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0226

Comparative Analysis of Sun Protection Factor (SPF) of Randomly Selected Branded Sunscreens Manufactured in the Philippines

Malan, Jehiel Lyre , Sabinay, Philip

UV radiation is a type of radiation emitted by the sun, alongside infrared and visible light. It is used by the body to help mediate natural synthesis of vitamin D and endorphins used by the body, but excessive UV radiation has adverse effects to the skin, like sunburns (erythema), premature skin aging, photosensitivity, suppression of the immune system, and even skin cancers. With the rise of temperatures due to global warming, demand for sunscreens - cosmetic products used to reduce the amount of UV radiation that reaches the skin - has also risen. Some studies have experimentally measured discrepancies between labeled and measured SPF values for the sunscreens. This study compares the labeled and measured SPF of some of the sunscreens manufactured in the Philippines, and has found major differences between the labeled and measured SPF values of the sunscreens. **(Author's abstract)**

Keywords: *Sun Protection Factor, UV radiation, UV rays, Sunburns, Premature Skin Aging, Chemistry*

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0227

Comparison of Sodium Alginate-Based Slow-Release Beads with Varying Calcium Chloride Concentrations

Florentino, Kiana Andrea , Santos, Tea Toni Fluer , Templonuevo, Cherry Dale

Calcium alginate-based slow-release beads have properties which allow them to be used as fertilizer reservoirs. This study aimed to determine whether the varied concentrations of the cross-linking agent, calcium chloride, has any effect on the slow-release rate of the beads in soil application and in water. Three concentrations at (3, 2, and 1 percent w/v) of calcium chloride were tested for UV-vis absorption and soil application, and their slow-release rates were determined. No significant difference was found among the various calcium chloride concentrations in both water and soil application, however the UV-vis spectrophotometry test showed that the 1 percent w/v calcium chloride concentration set-up had the slowest release rate in water. **(Author's abstract)**

Keywords: Calcium, Chloride Concentrations, Sodium, Chemistry

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Fil (S) Q76 P45 1/1 2018

0228

Compound Identification of the Methanolic Gut and Gonad Extracts of *T. gratilla*

Ambag, John Rafael, Comodoro, Blessie Marie, Salazar, Bernabe Angel, Mediodia, Harold

Taking into account that microbial populations in seawater may reach numbers as high as 10⁶/mL, it can be concluded that marine organisms, including sea urchins, are exposed in much harsher conditions in comparison to their terrestrial counterparts. Previous researches found out that various parts of *Tripneustes gratilla* manifest antimicrobial properties against an array of pathogenic bacteria, wherein the highest antimicrobial effect resulted from the guts and gonad extracts; however, the bioactive compounds present in this extract are still unknown. Identification of such bioactive compounds is necessary for the confirmation and correlation of the bactericidal effects and also the possibility of discovering novel compounds from this species. The extract was subjected to gas chromatography-mass spectrometry. The oven temperature was programmed from 110°C, with an increase of 10°C/min, to 200°C, then 5°C/min to 280°C, ending with a 9 min isothermal at 280°C. The whole sample ran for 36 minutes with the results identified by the systems spectral database. The chromatogram results showed a total of six prominent peaks. The compound n-hexadecanoic acid, which manifests antibacterial properties, was present in the sample alongside benzo[a]pyrene, 2,4-diisocyanato-1-methyl-benzene, both of which are carcinogenic and methadone N-oxide, a urinary metabolite; the presence of the two compounds suggest combustion of the sample due to the high temperatures utilized for the GC-MS procedure. From this, it can be concluded that certain compounds are present in the *Tripneustes gratilla* gut and gonads extract that can be attributed for its antimicrobial activity. **(Author's abstract)**

Keywords: *Tripneustes gratilla*, *E. coli*, *S. typhi*, *P. aeruginosa*, *S. sonnei*, *S. aureus*, *Penicillium spp*, Chemistry

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0229

CRY2 suppresses trophoblast migration and invasion in recurrent spontaneous abortion

Wu, Lianzhi, Cheng, Biheng, Liu, Qian, Jiang, Ping, Yang, Jing

Disruption of circadian rhythms is associated with aberrant trophoblast migration and invasion in recurrent spontaneous abortion (RSA). This study aims to explore the functional role and the mechanisms of cryptochrome

2 (CRY2), a fundamental component of the circadian clock, in regulating trophoblast migration and invasion. Human extravillous trophoblast cell line HTR-8/SVneo was used as a cell model. Cell migration and invasion were examined using wound healing assay and Transwell assay, respectively. The mRNA and protein levels were determined using quantitative real-time polymerase chain reaction and western blot, respectively. Luciferase reporter assay and chromatin immunoprecipitation assay were performed to explore the interaction between c-Myc to the brain and muscle ARNT-like protein 1 (BMAL1) promoter. CRY2 was highly expressed in human villous specimens of RSA. Furthermore, CRY2 overexpression impaired migration and invasion in HTR-8/SVneo cells, whereas CRY2 knockdown yielded the opposite results. Mechanistically, c-Myc bound to the BMAL1 promoter and induced BMAL1 transcription, both of which further activated matrix metalloproteinase 2/9 (MMP2/9) and facilitated migration and invasion in HTR-8/SVneo cells. CRY2 inhibited c-Myc-BMAL1 pathway and impaired migration and invasion of HTR-8/SVneo cells. Collectively, these findings demonstrate that CRY2 suppresses trophoblast migration and invasion via inhibiting c-Myc-BMAL1-MMP2/9 pathway. **(Author's abstract)**

Keywords: *BMAL1, c-Myc, CRY2, Recurrent spontaneous abortion, Trophoblast, Chemistry*

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0230

Crystal structure of the complex of the interaction domains of *Escherichia coli* DnaB helicase and DnaC helicase loader: structural basis implying a distortion-accumulation mechanism for the DnaB ring opening caused by DnaC binding

Nagata, Koji , Okada, Akitoshi , Ohtsuka, Jun , Ohkuri, Takatoshi , Akama, Yusuke , Sakiyama, Yukari , Miyazaki, Erika , Horita, Shoichiro , Katayama, Tsutomu , Ueda, Tadashi , Tanokura, Masaru

Loading the bacterial replicative helicase DnaB onto DNA requires a specific loader protein, DnaC/DnaI, which creates the loading-competent state by opening the DnaB hexameric ring. To understand the molecular mechanism by which DnaC/DnaI opens the DnaB ring, we solved 3.1-Å co-crystal structure of the interaction domains of *Escherichia coli* DnaB–DnaC. The structure reveals that one N-terminal domain (NTD) of DnaC interacts with both the linker helix of a DnaB molecule and the C-terminal domain (CTD) of the adjacent DnaB molecule by forming a three α -helix bundle, which fixes the relative orientation of the two adjacent DnaB CTDs. The importance of the intermolecular interface in the crystal structure was supported by the mutational data of DnaB and DnaC. Based on the crystal structure and other available information on DnaB–DnaC structures, we constructed a molecular model of the hexameric DnaB CTDs bound by six DnaC NTDs. This model suggested that the binding of a DnaC would cause a distortion in the hexameric ring of DnaB. This distortion of the DnaB ring might accumulate by the binding of up to six DnaC molecules, resulting in the DnaB ring to open. **(Author's abstract)**

Keywords: *Crystal structure, Distortion-accumulation mechanism, DnaB helicase, DnaC helicase loader, Helicase ring opening, Chemistry*

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0231

Determination of Chromium and Manganese in Steel Using Digital Photometry of Solutions

Vedad, Jason DR , Solivas, Josefina L. , Santos, Jose H. , del Rosario, Ernesto J.

The chromium and manganese contents of a steel sample were determined using digital photometric analysis. Digital still photographs of dichromate and permanganate solutions were taken using 10-megapixel (MP) and 12-MP digital cameras. RGB values were determined using the RGB Analysis of Image Colors and SI ColorPicker which are free-access software. G-B and a*-b* plots were constructed in order to calculate the analyte concentrations, which were then compared with those obtained by conventional spectrophotometric analysis. The concentrations obtained with the two digital cameras showed no significant differences at 95% confidence level from those calculated based on RGB values using the two software. Use of G-B plots resulted in greater accuracy than a*-b* plots for calculating chromium and manganese concentrations. Digital photometry (color image processing) was found to be reproducible and accurate and is a cheaper alternative to conventional spectrophotometry for determining the chromium and manganese contents of steel. **(Author's abstract)**

Keywords: *Chromium determination, Digital photometry, Manganese determination, Steel analysis, Chemistry*

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0232

Development of Cellulose-based Bioplastic from Corn Stalks

Rentoy, Felicia Alodia Marie , Angot, Dinah Ruth , Mabaquiao, Jimdel Ryu , Larroder, Aris

Due to the abundance of corn available, there is also a large amount of corn residue. The study aims to develop a cellulose-based sheet from corn stalks. The cellulose-based sheet was tested of its density, tensile strength, and percent elongation, and was analyzed with an fourier-transform infrared spectroscopy (FT-IR) to determine whether it is chemically similar with commercial cellophane. Overall, the cellophane sheet was similar to commercial cellophane in terms of the functional groups present but was weaker in terms of its mechanical properties. **(Author's abstract)**

Keywords: *Corn stalks, Cellulose-based Bioplastic, Carbon, Hydrogen, Oxygen, Nitrogen, Chlorine, Sulfur, Chemistry*

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0233

DNA Barcoding of Thiosulfate-Citrate-Bile Salts-Sucrose Agar-Selective Bacterial Species in the Mucus of *Acropora millepora* from Guimaras, Philippines

Suarez, Jr., Felix , Apdon, Czarina , Balinas, Rhydd Jay , Baldonado, Kate Mariene , Hernando, Krizzian

The purpose of this study was to identify Thiosulfate-citrate-bile salts-sucrose (TCBS) agar-selective bacterial species present in the mucus of *Acropora millepora* collected in Taklong-Island Marine Reserve. Nueva Valencia, Guimaras. Bacteria sample cultured in TCBS agar was sent to the Philippine Genome Center for the extraction and sequencing of the 16s rRNA gene. DNA Barcoding was done with the use of BioEdit

software and BLAST. The bacteria sample cultured and subcultured in TCBS agar plates displayed green colonies, each having a diameter of 0.3 cm. The bacterial 16s rRNA gene was successfully extracted using Quick-DNA Fungal/ Bacterial Miniprep Kit, amplified by PCR, and sequenced by Capillary Electrophoresis. The GenBank sequence database result displayed a 98 percent match with *Pseudomonas aeruginosa* 16S ribosomal RNA gene, partial sequence. This study will help assess the health of the *Acropora millepora* by further studying the implications of *Pseudomonas aeruginosa* found in its mucus. **(Author's abstract)**

Keywords: *Acropora millepora*, DNA Barcoding, *Pseudomonas aeruginosa*, Chemistry

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0234

Effect of Potassium Polyacrylate in Soil to Growth of *Zea mays* in Polyethylene Glycol-4000 Simulated Drought

Castaneda, Mary Emmanuelle , Hallado, Glennel Jan , Lujan, Recca , Mediodia, Catherine Joy , Aguaras, Lovie Grace

Zea mays L. (corn) is a staple food for about 20% of the Philippine population, making it one of the most important food crops in the country, but are threatened to have a decline in production due to El Nio and water shortage in the Philippines. This study aimed to investigate if the addition of potassium polyacrylate to the soil will improve soil water retention to help optimize the drought tolerance of *Zea mays* (maize). This can help develop a new method in assisting plant survival during drought conditions and increase crop yield and growth. Since drought is an impending problem that greatly affects agricultural industries, this study can help address the problem of hunger in some areas, especially those which rely greatly on corn produce. Thirty corn seeds were planted and divided among six different groups, five under PEG-induced drought stress

with varying concentrations of potassium polyacrylate incorporated to the soil, and one under normal conditions. Height, number of standing leaves, and soil moisture content were determined weekly for four weeks. Twenty-five plants germinated after five to six days. By the fourth week, only 11 plants were left. The results of the different parameters were insignificantly different, indicating that potassium polyacrylate was ineffective in improving soil water retention and does not help in the optimization of drought tolerance of maize. Increasing sample size, measuring daily osmotic potential, increasing frequency of measurements, observing until the reproductive stage and using PEG 6000 or 8000 instead of PEG 4000 are recommended for further studies. **(Author's abstract)**

Keywords: *Zea mays* L., Potassium, Corn, Chemistry

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0235

Effect of redox imbalance on protein modifications in lymphocytes of psoriatic patients

Wójcik, Piotr , Gęgotek, Agnieszka , Wroński, Adam , Jastrzęb, Anna , Żebrowska, Agnieszka

Lymphocytes are one of the most important cells involved in the pathophysiology of psoriasis; therefore, the aim of this study was to assess the redox imbalance and protein modifications in the lymphocytes of patients with

psoriasis vulgaris (PsV) or psoriatic arthritis (PsA). The results show a stronger shift in redox status to pro-oxidative conditions (observed as an increased reactive oxygen species level, a decrease in catalase activity and lower levels of glutathione peroxidase and vitamin E compared with healthy controls) in the lymphocytes of PsA than PsV patients. It is also favoured by the enhanced level of activators of the Nrf2 transcription factor in lymphocytes of PsV compared with decreased of these proteins level in PsA. Moreover, the differential modifications of proteins by lipid peroxidation products 4-oxononanal (mainly binding proteins) and malondialdehyde (mainly catalytic proteins with redox activity), promoted a pro-apoptotic pathway in lymphocytes of PsV, which was manifested by enhanced expression of pro-apoptotic caspases, particularly caspase 3. Taken together, differences in Nrf2 pathway activation may be responsible for the differential level of redox imbalance in lymphocytes of patients with PsV and PsA. This finding may enable identification of a targeted therapy to modify the metabolic pathways disturbed in psoriasis. **(Author's abstract)**

Keywords: Apoptosis, Lymphocytes, Protein modifications, Psoriasis, Redox balance, Chemistry

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0236

Effect of Zinc Chelate and Sulfate on Mineral Content, Antioxidant Activity and Grain Yield of *Vigna unguiculata* L.

Estrada-Dominguez, Veronica , Sanchez-Chavez, Esteban , de la Cruz Lazaro, Efraim , Cesar Marquez-Quiroz, Osorio-Osorio, Rodolfo

The study evaluated the effect of applying different doses of zinc sulfate and zinc chelate on the mineral content, antioxidant activity, and yield of grains of cowpea bean (*Vigna unguiculata* L.). Doses of 7, 14, and 28 mM L⁻¹ of zinc sulfate and chelate were assessed against a distilled water control. In the plants, the days to flowering as well as grain weight, number of pods, and number of grains per plant were recorded. Meanwhile, in the grains, antioxidant activity, phenols, phytic acid, and mineral content were determined. Results indicated that biofortification with 7 and 14 mM L⁻¹ of sulfate and zinc chelate increases earliness in flowering, the number of grains per plant, and the grain yield in addition to improving the mineral content of the grains. The highest antioxidant activity was found with the zinc chelate treatments. Phenol content increased with the zinc chelate and sulfate doses, while the phytic acid content decreased with respect to the control. Biofortification of cowpea beans with zinc chelate and sulfate at 28 mM L⁻¹ induced the highest accumulation of Zn in cowpea seeds. It is thus feasible to implement a biofortification program with zinc in cowpea beans to increase the zinc content, the mineral content, antioxidant activity, and phenol content in the grains, as well as to decrease the phytic acid content **(Author's abstract)**

Keywords: Phenols, Phytic acid, *Vigna unguiculata* L., Zinc chelate, Zinc sulfate, Chemistry

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0237

Enhancement of CO₂ Adsorption on Activated Carbon Prepared from *Canarium ovatum* Engl. Nut Shells

Yao, Marina G. , Pondevida, Josie L. , Cheng, Chi-Feng , Camacho, Drexel H.

New sources of activated carbon (AC) are desired for CO₂ capture. This study explored the potential of Philippine indigenous Pili tree (*Canarium ovatum* Engl.) waste nut shell as a source of new activated carbon. The charred sample has high fixed carbon content (86.81%), which upon activation, showed higher surface area (701 m²/g) and larger pore volume (0.45 cm³/g) compared to the unactivated sample. Modification of the carbon surface through impregnation of different amines resulted in lower surface areas, narrower pore volumes, and changes in morphology (from uniform geometric shape to spongy microstructures). The amine modified samples gave slight decrease in X-ray diffraction interlayer spacing ($d_{(002)}$) resulting in formation of micro crystallites that may promote CO₂ adsorption. Indeed, the modified AC samples had higher adsorption capacities for CO₂ than the original AC. The amount of adsorbed CO₂ on pentaethylenhexamine-modified AC was up to 2.380 mmol/g at 1 atm and 293 K, a 173% increase in comparison with that of the original AC. **(Author's abstract)**

Keywords: Activated Carbon, *Canarium ovatum*, CO₂ Capture, CO₂ Adsorption, Materials science, Pili nut, Chemistry

Philippine Journal of Science, Volume No. 144 Issue No. 2, 149-159
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Fil (S) Q1 P55 144/2 2015

0238

Eradication of *Staphylococcus aureus* Biofilms By Synergistic Action of Basil Oil and Vancomycin

Cabalfin, Zeb Jose Joshua , Gerona, Abigail Grace , Labrador, Victor Amadeus , Remaneses, Jeanelyn , Mediodia, Harold

The purpose of this study is to quantify the *in vitro* synergistic activity of basil oil and Vancomycin. A microtiter plate assay was used to determine the anti-microbial activity of the combination of both compounds against *Staphylococcus aureus* biofilms. The pre-formed biofilms were exposed to three different treatments: (1) Vancomycin, (2) basil oil. (3) and the combination of both. Water was used as the negative control. The three treatments were all active in eradicating the pre-formed biofilms with Vancomycin being the most effective followed by the combination of the two compounds. However, total biofilm removal was not achieved in any of the three treatments. The resulting action of the combination is less than that of vancomycin alone, but higher than that of basil oil alone, suggesting that there is an antagonistic interaction between the two compounds. **(Author's abstract)**

Keywords: *Staphylococcus aureus*, Basil Oil, Vancomycin, Chemistry

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0239

GRWD1 directly interacts with p53 and negatively regulates p53 transcriptional activity *Fujiyama, Hiroki , Tsuji, Takahiro , Hironaka, Kensuke , Yoshida, Kazumasa , Sugimoto, Nozomi , Fujita, Masatoshi*

Glutamate-rich WD40 repeat containing 1 (GRWD1) functions as a histone chaperone to promote loading of the MCM replication helicase at replication origins. GRWD1 is overexpressed in several cancer cell lines, and GRWD1 overexpression confers tumorigenic potential in human cells. However, less is known concerning its oncogenic activity. Our previous analysis showed that GRWD1 negatively regulates the tumour suppressor p53

via the RPL11-MDM2-p53 and RPL23-MDM2-p53 axes. Here, we demonstrate that GRWD1 directly interacts with p53 via the p53 DNA-binding domain. Upon DNA damage, GRWD1 downregulation resulted in increased p21 expression. Conversely, GRWD1 co-expression suppressed several p53-regulated promoters. GRWD1 interacted with the p21 and MDM2 promoters, and these interactions required p53. By using the Human Cancer Genome Atlas database, we found that GRWD1 expression levels are inversely correlated with the expression levels of some p53-target genes. Interestingly, high GRWD1 expression in combination with low expression levels of some p53-target genes was significantly correlated with poor prognosis in skin melanoma patients with wild-type p53. Taken together, our findings suggest a novel oncogenic function of GRWD1 as a transcriptional regulator of p53 and that GRWD1 might be an attractive therapeutic target and prognostic marker in cancer therapy. **(Author's abstract)**

Keywords: *GRWD1, p53, Transcriptional activity, Tumorigenesis, Chemistry*

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0240

Hexaploid-Tetraploid Landraces and Wild Species of Wheat Revealed Diversity for Antioxidants and Total Phenolics

Tariq, Huma , Awan, Shahid Iqbal , Sabir, Syed Mubashir , Ilyas, Muhammad

Wheat contains various phytochemicals, most importantly, antioxidants and polyphenolic compounds that have a variety of health-promoting effects. Seed material was obtained from 63 wheat genotypes of three species (*T. aestivum*, *T. durum*, and *T. sphaerococcum*) from Pakistan and Syria. This study was initiated to estimate and compare the interspecific and intraspecific diversity for antioxidant activity (AOA) and total phenolic content (TPC) in different species of wheat. The wild relatives and land races of three wheat species exhibited a highly significant interspecific and intraspecific diversity for both traits. *T. aestivum* exhibited more intraspecific diversity. The AOA of the genotypes ranged from 7.45% to 41.68%, being maximum in accessions of *T. durum* 12977 (41.68%). TPC ranged from 10.09 to 39.28 mg GAE g⁻¹ and was highest in *T. durum* accession 12999 (39.28 mg GAE g⁻¹). The lowest AOA (7.45%) and TPC (10.09 mg GAE g⁻¹) were observed in *T. aestivum* landrace LR-27. Hence, *T. durum* accessions 12999 and 12979 could be our desired accessions for future breeding programs having phytochemicals. Cluster analysis distributed the genotypes into four clusters. Genotypes of different origins grouped differently, indicating an environmental influence in the development of their genetic architecture. Cluster analysis indicated that 41.30% of the genotypes were included in the high AOA and TPC group. Members of *T. aestivum* that grouped in clusters 1 and 2 showed low to moderate AOA and TPC. The accessions of *T. durum* and *T. sphaerococcum* performed much better than *T. aestivum* for both of the biochemical traits. **(Author's abstract)**

Keywords: *Antioxidants, Landraces, Phytochemicals, Total phenolics, Triticum, Wheat, Chemistry*

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2020 March,
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0241

Immune Boosting Activity of Aqueous Lemongrass (*Cymbopogon citratus*) Leaf Extract on Native Chickens (*Gallus gallus domesticus*) Challenged with Newcastle

Disease

Sira, Ella Mae Joy, Valzado, Blessy Grace, Larroder, Aris, Cabarles, Jr., Jaime

Newcastle Disease is a highly infectious disease which can cause up to a 100% mortality in native chickens and no treatment has been yet found for it. Lemongrass (*Cymbopogon citratus*) is a plant that has alkaloid, saponin, tannin, and flavonoid to combat Newcastle disease. This study aims to measure and compare the antibody titre gain of Philippine native chickens treated with different dilutions of *C. citratus* aqueous extract. Forty-four two-month-old chickens were infected with live virus-concentrated solution. Blood was collected from all the samples prior to infection and after the treatment. Samples were grouped into four treatment groups A, B, C, and D, according to the dilution factor. Samples from the treatment group A were given with 1 mL undiluted *C. citratus* extract, treatment group B with 5-fold dilution, treatment C with 10-fold dilution, and treatment D with 20-fold dilution. Antibody titre gain was determined by hemagglutination inhibition. Results show that there is a significant increase with the antibody titre gain for unvaccinated and vaccinated groups. Unvaccinated samples do not require a treatment diluted in a specific volume of distilled water while vaccinated samples require a treatment diluted in 9 mL distilled water for an optimal antibody increase when infected with NDV. Treated samples have an increase in the average live weight with treatments B and C exhibiting a significant increase. Survival rate of the chickens is also high with 85.21%. **(Author's abstract)**

Keywords: *Aqueous Lemongrass, Cymbopogon citratus, Native Chickens, Gallus gallus domesticus, Chemistry*

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Fil (S) Q76 P45 1/1 2018

0242

Indole-3-Acetic Acid Synthesis by Plant Growth Promoting *Klebsiella* sp. (PGPB1) via Indole-3-Pyruvic Acid Pathway and its Uptake in Plants

Alvarez, Paul Lloydson J., Merca, Florinia E., Fernando, Lilia M., Roland V. Rallos, Mendoza, Christopher O.

¹⁵N-labeled tryptophan was used to trace the synthesis of indole-3-acetic acid (IAA) by plant growth promoting *Klebsiella* sp. (PGPB1). Preliminary thin layer chromatography analysis of crude extracts showed that IAA was produced from labeled tryptophan. This is further supported by high pressure liquid chromatography wherein the components of the crude extracts separated to two major peaks corresponding to indole-3-acetic acid (IAA) and indole-3-pyruvic acid (IPyA). Using Salkowski colorimetric assay, the extract was found to contain $11.81 \pm 5.98 \times 10^{-3}$ ppm of IAA and 56.91 ± 0.35 ppm of IPyA. The crude extract, IAA and IPyA fractions were found to be enriched with ¹⁵N. Likewise, the presence of higher concentration of IPyA in the extract indicates that PGPB1 is probably using the IPyA pathway in synthesizing IAA. Rice seedlings germinated and grown in the ¹⁵N-labeled IAA produced by PGPB1 showed significant differences from the control treatment in terms of higher fresh weight, root length, and shoot length. Rice seedlings were also found to be enriched in ¹⁵N, confirming that they were able to take up the applied ¹⁵N-labeled IAA. **(Author's abstract)**

Keywords: *Indole-3-acetic acid, Indole-3-pyruvic acid, ¹⁵N labeling, Plant growth promoting bacteria, Chemistry*

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0243

iTRAQ-based quantitative proteomic analysis of two transgenic soybean lines and the corresponding non-genetically modified isogenic variety

Liu, Weixiao , Zhang, Zhe , Liu, Xuri , Jin, Wujun

To investigate the unintended effects of genetically modified (GM) crops, an isobaric tags for relative and absolute quantitation (iTRAQ)-based comparative proteomic analysis was performed with seed cotyledons of two GM soybean lines, MON87705 and MON87701×MON89788, and the corresponding non-transgenic isogenic variety A3525. Thirty-five differentially abundant proteins (DAPs) were identified in MON87705/A3525, 27 of which were upregulated and 8 downregulated. Thirty-eight DAPs were identified from the MON87701×MON89788/A3525 sample, including 29 upregulated proteins and 9 downregulated proteins. Pathway analysis showed that most of these DAPs participate in protein processing in endoplasmic reticulum and in metabolic pathways. Protein–protein interaction analysis of these DAPs demonstrated that the main interacting proteins are associated with post-translational modification, protein turnover, chaperones and signal transduction mechanisms. Nevertheless, these DAPs were not identified as new unintended toxins or allergens and only showed changes in abundance. All these results suggest that the seed cotyledon proteomic profiles of the two GM soybean lines studied were not dramatically altered compared with that of their natural isogenic control. **(Author's abstract)**

Keywords: *Genetic modification, iTRAQ, qRT-PCR, Quantitative proteomic, Soybean seed cotyledons, Chemistry*

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0244

Kinetic and solvent isotope effects in oxidation of halogen derivatives of tyramine catalyzed by monoamine oxidase A

Pajak, Malgorzata

The isotope effects approach was used to elucidate the mechanism of oxidative deamination of 3'-halotyramines, catalyzed by monoamine oxidase A (EC 1.4.3.4). The numerical values of kinetic isotope effect (KIE) and solvent isotope effect (SIE) were established using a non-competitive spectrophotometric technique. Based upon KIE and SIE values, some of the mechanistic details of investigated reaction were discussed. **(Author's abstract)**

Keywords: *Deuterium, Enzyme mechanism, 3 -halotyramines, Isotope effects, MAO A, Chemistry*

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0245

Larvicidal Activity of *Anacardium occidentale* Against *Aedes aegypti*

Torres, Rosalinda C. , Garbo, Alicia G. , Walde, Rikkamae Zinca Marie L.

Dengue is the most serious vector-borne disease in the Philippines. This crucial fact led to main objective of the study which were to evaluate the toxicity of the ethanol and hexane extracts of *Anacardium occidentale* (cashew) shell wastes toward 3rd and 4th instars larvae of *Aedes aegypti* and to characterize the ethanol extract by qualitative phytochemical analysis. The shell wastes were processed for crude extraction using 95% EtOH and n-hexane. The

crude extract was bio-assayed for larvicidal activity against *A. aegypti* following the WHO standard bioassay method. The mortality was observed 24 and 48 hours after treatment and data were subjected to probit analysis to determine lethal concentrations (LC₅₀ and LC₉₀). The ethanol extract was characterized by phytochemical analysis. Both the hexane and ethanol extracts of *A. occidentale* shell wastes exhibited evidence of larvicidal toxicity. The crude ethanol and hexane extracts yielded an LC₅₀ of 2.35 mg/L and 6.93 mg/L, and LC₉₀ of 5.36 mg/L and 11.97 mg/L, respectively. Phytochemical screening of the crude ethanol extract of cashew shell wastes indicated the presence of unsaturated steroids and triterpenoids, free fatty acids, fats and oils, γ -benzopyrone nucleus (flavonoids), leucoanthocyanins, anthraquinones, and tannins. Both the hexane and ethanol extracts of *A. occidentale* showed promising potential as an alternative source of a more sustainable, non-toxic, and environmentally friendly solution for the control of dengue vector, *A. aegypti*. **(Author's abstract)**

Keywords: *Aedes aegypti*, *Anacardium occidentale*, Dengue vector, Larvicidal bioassay, Phytochemical analysis, Chemistry

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0246

Mass spectrometry-based methods for analysing the mitochondrial interactome in mammalian cells

Koshiba, Takumi, Kosako, Hidetaka

Protein–protein interactions are essential biologic processes that occur at inter- and intracellular levels. To gain insight into the various complex cellular functions of these interactions, it is necessary to assess them under physiologic conditions. Recent advances in various proteomic technologies allow to investigate protein–protein interaction networks in living cells. The combination of proximity-dependent labelling and chemical cross-linking will greatly enhance our understanding of multi-protein complexes that are difficult to prepare, such as organelle-bound membrane proteins. In this review, we describe our current understanding of mass spectrometry-based proteomics mapping methods for elucidating organelle-bound membrane protein complexes in living cells, with a focus on protein–protein interactions in mitochondrial subcellular compartments. **(Author's abstract)**

Keywords: *BioID, Mass spectrometry, Mitochondria, Proteome, XL-MS, Chemistry*

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0247

Microwave Copolymerized Carboxymethyl Cellulose-Chitosan Hydrogel

Gerona, Abigail Grace, Remaneses, Jeanelyn, Sorongon, Maxim

Copolymerization is a method used to connect different chains of polymers to form a hybrid macromolecule with modified properties of both polymers. Copolymerization can be done with different methods, one of which is microwave irradiation. Some naturally-occurring polymers are known to have excellent biocompatibility, biodegradability, and absorption. They are modified to become hydrogels or superabsorbent polymers that retain a huge amount of water. Microwave radiation initiates copolymerization. This study copolymerized carboxymethyl cellulose with chitosan using microwave radiation for 3, 6, and 9 minutes with carboxymethyl cellulose microwaved for 3 minutes as control. The findings of this study showed that the CMC-

Chitosan hydrogel yielded lower gel content compared to the control group which is the CMC hydrogel. The polymer irradiated for 9 minutes is the most efficient in terms of absorbency. All in all, the three experimental set-ups had exhibited ideal absorption values, with a slower de-swelling ratio. **(Author's abstract)**

Keywords: Copolymerization, Macromolecule, Hydrogel, Chemistry

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0248

miR-146a promoted breast cancer proliferation and invasion by regulating NM23-H1

Chen, Jun , Jiang, Qiang , Jiang, Xue-Qin , Li, De-Quan , Jiang, Xiao-Cheng , Wu, Xiao-Bo , Cao, Ya-Li

The study aimed to investigate the regulatory effect of miR-146a in proliferation, invasion and migration of breast cancer and its possible mechanism via NM23-H1. The expression levels of miR-146a in breast cancer with different pathological classification were significantly increased, while the expression levels of NM23-H1 were significantly decreased, which were closely correlated. Double luciferase reporter gene was used to verify the target regulatory relationship between miR-146 and NM23-H1 on a human breast cancer cell line. miR-146a was closely related to the proliferation and metastasis of breast cancer. miR-146a also promoted the growth of breast cancer in vivo via targeting NM23-H1. In conclusion, miR-146 can promote the proliferation and invasion of breast cancer by targeting NM23-H1. **(Author's abstract)**

Keywords: Breast cancer, Hsa-miR-146a, Invasion, NM23-H1, Proliferation, Chemistry

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0249

MiRNA-96-5p contributed to the proliferation of gastric cancer cells by targeting FOXO3

He, Xionghui , Zou, Kejian

Various microRNAs (miRNAs, miRs) and the forkhead box O (FOXO) family proteins have been shown to influence gastric cancer progression and development. Here, we aimed to identify the gastric cancer related miRNAs and their relationship with the FOXO family. MiRNA profiles were generated by miRNA microarray screening from pre-operative plasma samples. Quantitative reverse transcription PCR and western blot were used to determine the expression levels of miR-96 and FOXO family. 3-(4,5-Dimethylthiazol-2-yl)-2,5-Diphenyltetrazolium Bromide assay and colony formation assay were used to test the cell viability. The miR-96-5p and FOXO3 interaction were confirmed by luciferase reporter assay. Our results demonstrated the excessive expression of miR-96-5p in gastric cancer cell lines and plasma samples from gastric cancer patients. In addition, the protein levels of FOXO3 were decreased in tissue samples from gastric cancer patients. Moreover, miR-96-5p accelerated the gastric cancer cell proliferation by directly targeting FOXO3. Therefore, we conclude that miR-96-5p might promote the progression of gastric cancer by directly targeting FOXO3 mRNA and downregulating the expression of FOXO3 protein, which provides new insights for the molecular mechanism of gastric cancer. **(Author's abstract)**

Keywords: Forkhead box O3 (FOXO3), Gastric cancer, MiR-96-5p, Chemistry

N¹-methyladenosine (m¹A) RNA modification: the key to ribosome control
Shima, Hiroki , Igarashi, Kazuhiko

RNA displays diverse functions in living cells. The presence of various chemical modifications of RNA mediated by enzymes is one of the factors that impart such functional diversity to RNA. Among more than 100 types of RNA modification, N¹-methyladenosine (m¹A) is found mainly in tRNA and rRNA of many living organisms and is known to be deeply implicated in the topology or function of the two classes of RNA. In this commentary article, we would like to deal with the functional significance of m¹A in RNA, and also to describe one methyltransferase installing m¹A in a large subunit rRNA, whose orthologue in *Caenorhabditis elegans* was discovered recently and was reported in this journal. **(Author's abstract)**

Keywords: *m1A, Rrna, Ribosome, Methyltransferase, Chemistry*

Nonmuscle myosin IIA and IIB differently suppress microtubule growth to stabilize cell morphology

Sato, Yuta , Kamijo, Keiju , Tsutsumi, Motosuke , Murakami, Yota , Takahashi, Masayuki

Precise regulation of cytoskeletal dynamics is important in many fundamental cellular processes such as cell shape determination. Actin and microtubule (MT) cytoskeletons mutually regulate their stability and dynamics. Nonmuscle myosin II (NMII) is a candidate protein that mediates the actin–MT crosstalk. NMII regulates the stability and dynamics of actin filaments to control cell morphology. Additionally, previous reports suggest that NMII-dependent cellular contractility regulates MT dynamics, and MTs also control cell morphology; however, the detailed mechanism whereby NMII regulates MT dynamics and the relationship among actin dynamics, MT dynamics and cell morphology remain unclear. The present study explores the roles of two well-characterized NMII isoforms, NMIIA and NMIIB, on the regulation of MT growth dynamics and cell morphology. We performed RNAi and drug experiments and demonstrated the NMII isoform-specific mechanisms—NMIIA-dependent cellular contractility upregulates the expression of some mammalian diaphanous-related formin (mDia) proteins that suppress MT dynamics; NMIIB-dependent inhibition of actin depolymerization suppresses MT growth independently of cellular contractility. The depletion of either NMIIA or NMIIB resulted in the increase in cellular morphological dynamicity, which was alleviated by the perturbation of MT dynamics. Thus, the NMII-dependent control of cell morphology significantly relies on MT dynamics. **(Author's abstract)**

Keywords: *Actin, Cell Morphology, Cytoskeletal crosstalk, Microtubule, Nonmuscle myosin II, Chemistry*

Physicochemical and sensory properties of steamed bread fortified with purple sweet potato flour
Zhu, Fan , Sun, Jia

Whole purple sweet potato flour (PSP) is rich in various nutrients such as anthocyanins and dietary fiber. Chinese steamed bread (CSB) is a fermented food eaten by Chinese populations. Freeze-dried PSP was incorporated into CSB formulations up to 50%. The physicochemical and sensory properties of the resulting CSB were studied. The results showed that PSP addition up to 50% increased the antioxidant activities of CSB, while reducing the glycemic response. The total polyphenol/anthocyanin contents of CSB increased with increasing PSP level, although a portion of these polyphenols were lost during CSB production. PSP addition up to 50% had little effect on the water activity and water content of CSB and increased the hardness, while decreasing the specific volume. CSB with 5–10% PSP improved the overall sensory acceptance. PSP can be used in CSB up to 10% with wheat flour to enhance the functional properties of CSB without compromising eating quality. (Author's abstract)

Keywords: *Polyphenol, Anthocyanin, Glycemic index, Chinese steamed bread, Mantou, Purple sweet potato, Ipomoea batatas, Chemistry*

Food Bioscience, Volume No. Issue No. , 1-8
 2019,
 (Filipiniana Analytics)
 F(S) TP248.65.F66 F66 n30 2019

Potential for Biodiesel Production of Selected Seaweed Species from Taklong Island, Guimaras
Almarza, Lourde Frances Mye , Gatila, Sheena , Inosanto, Norielle

The total lipid content and fatty acid composition of *Dictyota dichotoma*, *Padina minor*, and *Sargassum cristaefolium* found in Taklong Island, Guimaras were evaluated for their biodiesel potential. The total lipid contents were determined using the Bligh and Dyer method while the fatty acid compositions were analyzed using Gas Chromatography-Mass Spectrometry. *Padina minor* (11.003 of its weight(w)) showed the highest total lipid content, followed by *Dictyota dichotoma* (8.003 w), and the lowest is *Sargassum cristaefolium* (5.673 w). This study evaluated the lipid content of the species and supported established researches regarding conspecific variations between species. With a total lipid content exceeding 103, *Padina minor* may be considered as a suitable candidate for biodiesel production in terms of total lipid content. The assessment of the biodiesel properties of the three seaweed species also passed the European biodiesel standards: EN 14214 and ASTM 06751-02. (Author's abstract)

Keywords: *Dictyota dichotoma, Padina minor, Sargassum cristaefolium, Chemistry*

Publiscience A Research Journal of High School Researches, Volume No. 1 Issue No. 1, 129-134
 2018 May,
 (Filipiniana Analytics)
 Fil (S) Q76 P45 1/1 2018

Purification, biochemical and molecular study of lipase producing from a newly thermoalkaliphilic *Aeribacillus pallidus* for oily wastewater treatment
Ktata, Ameni, Krayem, Najeh, Aloulou, Ahmed, Bezzine, Sofiane, Sayari, Adel, Chamkha, Mohamed, Karray, Aida

Treatment of oily wastewater is constantly a challenge; biological wastewater treatment is an effective, cheap and eco-friendly technology. A newly thermostable, haloalkaline, solvent tolerant and non-induced lipase from *Aeribacillus pallidus* designated as GPL was purified and characterized of biochemical and molecular study for apply in wastewater treatment. The GPL showed a maximum activity at 65°C and pH 10 after 22 h of incubation, with preference to TC4 substrates. Pure enzyme was picked up after one chromatographic step. It displayed an important resistance at high temperature, pH, NaCl, at the presence of detergents and organic solvents. In fact, GPL exhibited a prominent stability in wide range of organic solvents at 50% (v/v) concentration for 2 h of incubation. The efficiency of the GPL in oil wastewater hydrolysis was established at 50°C for 1 h, the oil removal efficiency was established at 96, 11% and the oil biodegradation was confirmed through fourier transform infrared (FT-IR) spectroscopy. The gene that codes for this lipase was cloned and sequenced and its open reading frame encoded 236 amino acid residues. The deduced amino acids sequence of the GPL shows an important level of identity with *Geobacillus* lipases. **(Author's abstract)**

Keywords: *Aeribacillus pallidus*, Lipase, Oil biodegradation, Thermo alkaliphilic, Chemistry

The Journal of Biochemistry, Volume No. 167 Issue No. 1, pages 89-99
2020 January,
(Filipiniana Analytics)
F(S) QP501 J82 167/1 2020

0255

Quality Evaluation and Utilization of *Tapuy* (Philippine Rice Wine) Lees Flour
Manaois, Rosaly V., Morales, Amelia V.

This study was conducted to evaluate *tapuy* lees, or the residue of Philippine rice wine (*tapuy*) processing, as a food ingredient. *Tapuy* lees from different rice varieties were prepared into flour (TLF) and assessed for their physicochemical properties and storage properties. TLF was then substituted to wheat flour in butterscotch at different levels, namely, 0, 15, 30, 45, and 60% (wt/wt) and the products were evaluated for their sensory and nutritional quality. Results showed that regardless of rice variety, TLF contained high levels of crude protein (CP) and dietary fiber (OF) at 44.1-57.0% and 10.2-16.5%, respectively. TLF could last up to 5 mo when stored at ambient condition (26±1 °C) in 0.03 or 0.07 mm polyethylene (PE) packaging and ≥ 7 mo when stored at low temperatures (4±1 °C). When used to substitute for wheat flour in butterscotch, increasing the levels of TLF resulted in products with higher moisture content, but water activity remained at 0.67. The degree of sweetness and caramel taste, stickiness, denseness, and moistness were not affected by TLF substitution. Use of at least 45% TLF resulted in more grainy/gritty butterscotch with significantly perceptible lees-like/fermented off-taste and off-flavor. With the optimum formulation of 30% TLF substitution, significant improvement in CP content from 4.6 to 7.3 g 100g⁻¹ and OF from 1.0 to 2.3 g 100g⁻¹ were observed. Results indicated the potential of a major by-product of rice wine manufacture in the development of a high-protein and high-fiber food ingredient. **(Author's abstract)**

Keywords: *Dietary fiber, Nutritional properties, Proteins, Rice wine, Sensory properties, Shelf life, Tapuy, Chemistry*

The Philippine Journal of Crop Science, Volume No. 43 Issue No. 1, 29-37
2018 April,
(Filipiniana Analytics)
Fil (S) SB189 P45 43/1 2018

Synthesis and Biological Evaluation of Fused Pyrans Bearing Coumarin Moiety as Potent Antimicrobial Agents

Renuka, Nagamallu , Kumar, Kariyappa Ajay

A simple approach for the synthesis of fused pyrans to coumarin moiety is presented. The intramolecular cyclisation of 1-aryl-3-(7-hydroxy-4-methyl-2-oxo-2H-chromen-8-yl)-1H-pyrazole-4-carbaldehydes under reflux conditions at 80°C afforded fused pyrans in a relatively good yield. The synthesized compounds were characterized by spectral studies and elemental analysis. The new compounds were evaluated in vitro for their antifungal and antibacterial activity against different fungi and bacterium species. **(Author's abstract)**

Keywords: *Antibacterial, Coumarins, Intramolecular, MIC, Pyrazoles, Chemistry*

Philippine Journal of Science, Volume No. 144 Issue No. 1, 91-96
2015 June,
(Filipiniana Analytics)
Fil (S) Q1 P55 144/1 2015

Synthesis of Chitosan-Hydroxyapatite Composite Gel from Waste Crab Shells for Oil Adsorption

Janiya, Danielle , Lopez, Renee Zoe , Magtoles, Lyca Marie

Composites consisting of oil adsorbing materials such as chitosan and hydroxyapatite has been proven to be a viable oil adsorbent in treating oil spills As a waste product, crab shells can be utilized as a source of raw materials for an oil adsorbent. In this study, the oil adsorption capacity of synthesized chitosan-hydroxyapatite composite were investigated and compared. Chitosan and hydroxyapatite were simultaneously extracted from crab shells The extracted samples were then verified using the Fourier Transform Infrared Spectroscopy. 1:1 ratio of chitosan and hydroxyapatite were prepared in a form of a gel composite. **(Author's abstract)**

Keywords: *Chitosan, Hydroxyapatite, Crab Shells, Chemistry*

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2018 May,
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Fil (S) Q76 P45 1/1 2018

T.E.R.R.A. (The Economical Response to Reduce Air Pollution): A New Device for Facilitating the Sequestration and Mineralization of (CO₂)

Gurrea, Luke Kenneth , Peregrino, Fern Rose , Regalado, Joachim , Salvador, Erika Eunice

The atmospheric level of carbon dioxide (CO₂) has exceeded the 400 parts per million (ppm) threshold in 2015, making global warming a concerning cause for alarm. To lessen carbon emissions, Nickel Nanoparticles (NiNPs) have been proven to catalyse mineral carbonation in a Calcium Hydroxide (Ca(OH)₂) solution (Bhaduri Siller 2012). This is seen as a viable method to reduce CO₂ in the atmosphere. However, this technology has not yet been applied in an actual device. T.E.R.R.A. (The Economical Response to Reduce Air Pollution) is a device which utilizes the catalytic effect of NiNPs and uses it to lessen the carbon

emissions of vehicles. When tested in a laboratory setting, it was found that T.E.R.R.A. was able to sequester 82.5 percent of CO₂ bubbled through. With lower pressure and improvements in the design, it is projected that higher amounts of CO₂ may be sequestered by T.E.R.R.A. , deeming it a feasible device for the mitigation of carbon emissions. **(Author's abstract)**

Keywords: *Carbon dioxide, Calcium Hydroxide , The Economical Response to Reduce Air Pollution, Chemistry*

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2018 May,
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Fil (S) Q76 P45 1/1 2018

0259

Two-stage process on the growth of high-density zinc oxide nanostructures via chemical bath deposition on glass substrates

Senados, Kennet

Zinc oxide nanostructures were deposited on glass substrates using ZnSO₄ with varying NH₄OH concentration via one-stage and two-stage chemical bath deposition (CBD) method. The two-stage process was prepared by pre-treatment of the glass substrates with ZnO colloid powder which were obtained from a previous bath deposition before the CBD takes place. Scanning electron microscope (SEM) images revealed that the two-stage CBD technique yielded a high-density of the ZnO nanostructures as compared to the one-stage process. Moreover, the growth of ZnO nanostructures exhibits a hexagonal structure as revealed by the SEM images. The growth of high-density ZnO nanostructures via two-stage CBD technique can be explained by the presence of the early nucleation of ZnO nuclei provided during the pre-treatment of the substrate with ZnO colloid powders. Furthermore, annealing the as-grown nanostructures at 200°C resulted into the decomposition of Zn complexes forming high-quality ZnO nanostructures and coalescence of smaller ZnO nanostructures to formed bigger ones also occurred. Higher absorption spectra can also be observed from the nanostructures grown via the two-stage process which further confirms the growth of high-density ZnO nanostructures. The calculated energy band gap extracted from the UV-Vis spectra is in good agreement with the reported energy band gap of ZnO nanostructures.

Keywords: *nanostructure, chemical bath deposition, glass substrate, scanning electron microscope, Chemistry*

Mindanao Journal of Science and Technology, Volume No. 15 Issue No. 1,
2017,
(Filipiniana Analytics)

0260

Urate Oxidase (UOx)-Copper Oxide (CuO)-Carbon Polymer Composite Electrode for Electrochemical Detection of Uric Acid

Buenaventura, Angelo Gabri

This study presents an electrochemical biosensor developed for uric acid (UA) determination using carbon paste electrode (CPE) modified with copper (II) oxide (CuO) particles and urate oxidase (UOx) enzyme. Base CPE is prepared using a multi-walled carbon nanotube (MWCNT) and a polydimethylsiloxane (PDMS) binder. The main sensing process is based on the oxidation of UA into 5-hydroxyisourate (HIU) as catalyzed by UOx, forming H₂O₂ as byproduct, and then the H₂O₂ reduction-oxidation (redox) reaction converts CuO to form Cu₂O; the amount of H₂O₂ and hence UA in the sample is measured by the oxidative current measured for the conversion of Cu₂O back to CuO. Cyclic Voltammetry (CV) measurements revealed that the activity of UOx was retained with an

apparent Michaelis constant (K_m^{app}) to be equal to 41.46 μM . Differential Pulse Voltammetry (DPV) measurements of UA using UOx-CuO-CPE showed a linear response ranging from 10 μM to 79.4 μM UA with a limit of detection (LOD) determined to be equal to 8.82 μM . UOx-CuO-CPE was shown to be selective towards UA even in the presence of creatinine, xanthine, and glucose. Furthermore, UOx-CuO-CPE was shown to be reusable (3.28% RSD), and its fabrication is repeatable using single factor Analysis of Variance (ANOVA) [$F(1.396) < F_{critical}(5.143)$]. UOx-CuO-CPE was also shown to be stable even after five weeks of storage using the two-sample t-test [$t(0.156) < t_{critical}(4.303)$]. Based on a recovery test using synthetic urine sample, this study showed the applicability of UOx-CuO-CPE in the detection of UA in human urine with 90.27%–102.03% recovery ($n = 3$).

Keywords: *Urate Oxidase, Copper (II) Oxide, Carbon Paste Electrode, Uric Acid, Chemistry*

Science Diliman, Volume No. 32 Issue No. 2, 42-76
2020,
(Filipiniana Analytics)

COMMUNICATIONS

0261

Fake news, panic pandemic and responsible use of communications media *Alfaro, Den*

Fake news has been circulating since before the COVID-19 pandemic, especially through social media, emails and instant messaging apps. When the World Health Organization (WHO) declared COVID-19 as a global pandemic, a lot of misinformation regarding the virus proliferated mostly online. How it started, why it started and who started it were concluded as facts, but none of it has been proven. Moreover, news about the cure proliferated that led to some people trying it out, but died in the end due to misinformation. This paper explores how fake news spread, why it is spreading and why it causes panic to people during the COVID-19 pandemic. It also looks into how crucial the role of media is in these trying times.

Keywords: *fake news, panic pandemic, COVID-19, communications, information dissemination, misinformation, media relations, Communications*

International Journal on Social Innovation & Research, Volume No. 11 Issue No. 1,
2020,
(Filipiniana Analytics)

ECOLOGY

0262

Forest Litterfall in Mount Kasunogan *Belar, Irvin D*

Forest litterfall is plant materials that have been fallen to the ground. It is vital in the process of nutrient forests. The vegetation of the stations in Mount Kasunogan consisted of 7 plant species from 7 different families; Tamanu (*Calophyllum*) from Calophyllaceae, Sweet flag (*Calamus* sp.) from Acoraceae, Pitanga (*Eugenia* sp.) from Myrtaceae, Cogon Grass (*Imperata cylindrica*) from Poaceae, Hickory Wattle (*Mangium* sp.) from Fabaceae, Nutrush (*Scleria scrobiculata*) from Cyperaceae, Screw pine (*Pandanus odoratissimus*) from Pandanaceae, and

Ivory Mahogany (*Dysoxylum* sp.) from Meliaceae. The researchers investigated litterfall production and decomposition rate and correlated these two essential processes to the soil physical and chemical composition of Mount Kasunogan. Organic matter, soil pH level, and soil moisture have a significant influence on litter production and what factors could increase or decrease its production. It has been denoted that all soil attributes (organic matter, soil pH level, and soil moisture) impact forest litterfall production. However, two of the attributes, which are the organic matter and soil moisture, barely contribute to the litterfall. In contrast, the soil pH is perfectly correlated and has a significant effect on litterfall production. Station three's advantage regarding the soil pH and wind presence due to its high elevation explains a large amount of litter production in the area. In this study, it is also concluded that the acidic the soil gets, the faster the decomposition, which also resulted in the faster decomposition in station 2 among the rest of the sites in Mount Kasunogan.

Keywords: *Litterfall production, decay or decompose, litterfall, nutrient cycling, Ecology*

SMCC Interdisciplinary Journal, Volume No. 1 Issue No. 1,
2020,
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EDUCATION

0263

Behavioral intention of students in utilizing new technology in studying: a quantitative approach

Cabauatan, Ronaldo

With the “industrial revolution 4.0” at hand, students are adopting to new technologies available in the market that could lessen the burden of studying. Lots of online materials, software, and applications are now made available for students for the purpose of coping with the different school activities given by their teachers. These new tools in learning, if used properly, would lessen the burden of and time spent by each student in accomplishing the tasks assigned to them by their mentors. Though new technologies are seen to be helpful and available, there are still students who prefer the traditional way of learning. This phenomenon signals the researchers to determine the behavior and intention of students in using the new technologies available to them. Applying multiple linear regression and with the support of coefficient of determination (R^2), the researchers found significant pieces of evidence on the relationships and the effects of students' behavior and intention, and available technology on the way they use the new and emerging technology in the market, specifically in the educational system. Results showed that intention, behavior, and technology have a positive impact on the decision of students to use the new technology with a goodness of fit of 91.50 percent. With these, the researchers suggest that school administrators should invest more on the acquisition of the new technology in education and provide trainings and seminars for faculty members and students in explaining the usefulness and the advantages of these breakthroughs to education.

Keywords: *education strategy, online platform, blended learning, behavioral response, new normal, education system, Philippines, Education*

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2020,
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0264

Career choice factors: implications to the 21st century BS Tourism Management curriculum
Guiling, Frank

This study uses a qualitative-quantitative approach meant to improve the undergraduate tourism management curriculum of a Catholic University. The 2019 graduating students of Bachelor of Science in Tourism Management (BSTM) of St. Paul University Quezon City (SPUQC) provided extensive data on their perceptions about their curriculum and the reasons they opted to take this program. Findings showed that the BSTM curriculum of SPUQC is competitive but there are some areas which need improvement. The research instrument was a survey questionnaire which was validated by a statistician and industry experts. The frequency and the percent distributions and weighted mean were used in showing the students' responses. The introduction of professional aviation related subjects in the curriculum was considered as one of the primary vehicles to make the program more attractive to students. Factors that affect career choice among tourism students were fast employability of BSTM graduates here and abroad and the industry offering high paying jobs and immense job opportunities and involving frequent travelling and immersion in cross cultural exchanges. Furthermore, results revealed that the 21st century tourism curriculum should focus on blended learning, the collaboration of critical thinking and problem solving skills, knowledge that leads to developing new skills, introduction of "multi-literacy" and provision of skills set applicable in facing the real world of travel and tourism.

Keywords: *BS Tourism Management, employability, industry, curriculum, multi-literacy, Education*

International Journal on Social Innovation & Research, Volume No. 11 Issue No. 1,
2020,
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0265

Case-based teaching and learning in enhancing the academic performance of students in disaster readiness and risk reduction
Abanto, Lem

The main purpose of this study was to assess the impact of Case-Based Teaching and Learning to the academic performance of Science, Technology, Engineering and Mathematics (STEM) students in Disaster Readiness and Risk Reduction of Malinta National High School-Senior High, Valenzuela City. This study made use of True-Experimental Research design that utilized standard questionnaires as a primary data gathering tool, the questionnaires undergo Face and Content validation as well as the Cronbach's Alpha and obtained .87 reliability results. The Control Group obtained a mean score of 26.15 and the Experimental Group obtained a mean score of 33.8. The results show that there is a difference of 15.32 % from their posttest. The t-test revealed that there is a significant difference between the posttest result of Control Group and the Experimental Group. Case-Based Teaching and Learning includes collaboration between participants and discussion of specific situations, typically examples of real-world situations. The teacher serves as facilitator in Case-Based Teaching thus encourages case exploration and consideration of the actions of the characters in the light of their own choices.

Keywords: *disaster readiness and risk reduction, case-based teaching and learning, outcome-based education, Education*

Enderun Colleges Scholarly Review, Volume No. 3 Issue No. 2,
2020,
(Filipiniana Analytics)

Challenging Popular Assumptions on Teacher Education *Dayagbil, Filomena T. , Enriqueta R*

The Revised Policies and Standards for the Undergraduate Teacher Education Curriculum, articulated in CHED Memorandum Order No. 30 (CMO 30) in 2004, marks a significant curriculum reform for teacher education in the Philippines. This paper examines the ideas and assumptions behind the reform policies articulated in CMO 30, explores the theoretical basis of these assumptions within the framework of levels of curriculum representation, and validates these assumptions from the perspective of teacher educators and students in two selected teacher education institutions in Cebu City. Using a researcher-made five-point scale, the respondents assessed a set of pre-specified assumptions on the revised teacher education curriculum with regard to the extent to which these assumptions hold in their teaching-learning environments. Results showed that the assumptions that had the highest perception ratings among teacher educators and students revolved around the assessment of entry competence of teacher education students; strengthening the connections between theory and teaching practice through the Experiential Learning Courses; the use of the National Competency- Based Teacher Standards (NCBTS) as basis for teaching practice; and the integration of theoretical principles, concepts and methods in professional education courses. To validate these assumptions, respondents also assessed their teaching-learning environments using a 7-point semantic differential based on bipolar characteristics of conventional and constructivist learning environments in terms of the nature of classes, the role of teachers and students, learning modes, instructional emphasis and assessment of student learning. Results showed that teacher educators perceived their teaching-learning environment as moving towards the constructivist while students perceived their environment as a mix of conventional and constructivist. From the results, implications and challenges for curriculum implementation and research are drawn as basis for recommending concrete actions towards the delivery of teacher education programs based on reform efforts anchored on evidence from research. **(Author's abstract)**

Keywords: *Teacher education, Revised teacher education curriculum, Curriculum reform, Assumptions on teacher education, Education*

CNU Journal of Higher Education, Volume No. 4 Issue No. 1, 98-116
2010,
(Filipiniana Analytics)
NP

A Comparative Analysis of Field Study Courses: Input for the University of Rizal System Pre-Service and In-Service Teacher Education *Binaluyo, Joselito E. , San Juan, Daisy A. , Robles, Lourdes N. , De Leon, Olivia F., Ison, Glen*

Teacher Education is known to be an important field for research. Similarly, as one of the most popular and preferred fields, teacher education has been confronted by a lot of issues and concerns affecting and making it a relevant topic for discussions, debates, arguments, and studies. The very crucial roles and contributions of teacher education Institutions as pillars of teacher education, is of great value to a country like the Philippines not only in promoting teacher education but more importantly, in developing quality teachers who promote effective instructional high quality that focuses on student learning outcomes. Basically, teacher education institutions are expected to perform gigantic tasks of uplifting and upgrading, and strengthening the quality of teacher education. This paper aims to make a comparative analysis of field study courses as an input to pre-service and in-service teacher education with an end goal of coming up with a Student Teachers Enhancement Program, or STEP. Through the utilization of the purposive sampling and descriptive-evaluative method of research, this paper reveals the mastery level of the required competencies in the field study courses in the context of the URS experience. It was found out that competencies in the field study courses were very much attained as perceived by the pre-service and in-service teacher educator respondents and as statistically entered, the results revealed that there is no significant difference in the respondents' perception of the mastery level attained. **(Author's abstract)**

Keywords: *Competencies, Field study courses, Pre-service, In-service, Teacher education, Student teacher enhancement program (STEP), Education*

CNU Journal of Higher Education, Volume No. 4 Issue No. 1, 139-159
2010,
(Filipiniana Analytics)
NP

0268

Dynamics of Code-Switching In Academic Discourse: Evidences for Multilingual Education Bill

Ramos, Ar

The aim of uniting the Filipinos for community building allowed government leaders and lawmakers to see the role of language motivating them to draft and promulgate laws for communication and instruction. However, at present, the government only perceives the critical role of Filipino in performing civic duties, declaring it a national code and English, to respond internationally, while regional languages are only used as auxiliary codes up to grade two only, leaving non-Tagalogs with doubts of the real purpose of legalizing Filipino and English as languages of communication and instruction. This paper reveals that auxiliary languages with English exist in academic discourse to facilitate learning even in a Higher Educational Institution. **(Author's abstract)**

Keywords: *Code-switching, Laws for communication and instruction, Multilingual education bill, Unity, Education*

CNU Journal of Higher Education, Volume No. 4 Issue No. 1, 12-23
2010,
(Filipiniana Analytics)
NP

0269

An Econometric Model for Determining Sustainability of Basic Education Development

Abocejo, Ferdinand T., Bacud, Donnie

The paper attempted to define an analytical framework for discussing the issue of economic sustainability for basic education in the Philippines. The said framework was summarized in terms of two indices: one which looks at the degree of insufficiency of basic education funding and another which considers time intervals in which sufficiency or insufficiency is noted. A logistic model was fitted to the gathered data sets where raw observations were standardized prior to performing regression analysis on identified variables. The findings revealed that a unit increase in per capita budget increases enrolment by 624 students in basic education. Relatedly, 97% of the variance in actual basic education enrolment is attributed to the per capita budget allocation on basic education by the national government. The study found that population growth rate and economics (GDP per capita) are the two main driving forces in basic education development. School-age population is growing by about 6% annually whereas the country's GDP average yearly growth just reaches about 4%. Ultimately, the fast expanding population has to be curbed if the country is to achieve the Millennium Development Goals (MDGs) of Education For All (EFA). **(Author's abstract)**

Keywords: *Basic education, Per capita budget education, Participation rate, School-age population, Education*

CNU Journal of Higher Education, Volume No. 4 Issue No. 1, 40-53
2010,

An Empirical Analysis of the Impact of the Teacher Factor on Student Performance across Countries Based on the 2003 TIMSS Mathematics Scores

Montalbo, Imelda C., Pogoy, Angeline

The study analyzed the impact of six (6) teacher characteristics on the mathematics performance of students based on the TIMSS (2003) mathematics scores of the top 20 and lowest 20 performing countries. Data analysis consisted of an initial exploratory procedure via forced cluster analysis and a formal test of statistical hypotheses through t-tests, analysis of variance and regression analysis. Results revealed that only three (3) of the six (6) characteristics, namely: hiring system of the nations, percentage of teachers with board certification, and nature of induction programs have statistically significant bearings on the overall quality of mathematics education in these countries. **(Author's abstract)**

Keywords: *Cluster analysis, Confirmatory methods, TIMSS mathematics, Teacher characteristics, Education*

Enhancement of Teacher Competencies through Experiential Learning Courses: Implications to the Pre-Service Teacher Education Curriculum

Lucido, Paz I., Torno, Beatriz G., Bilbao, Pur

A survey of seventy-two teacher training institutions and 2,027 prospective teachers across the country was conducted to find out the implementation of the experiential learning courses of the new teacher education curriculum. The findings revealed that all the experiential learning courses were implemented with similarities and differences in the delivery modes within the frame of time to complete the education degree programs. The public schools were made partners as cooperating schools and a laboratory for the field studies, and the teachers acted as resource persons. Both the teacher-training institutions and the cooperating public schools gained advantages as well as underwent difficulties in the implementation. On the other hand, the prospective teachers claimed to have enriched their experiences and enhanced their preparation to become teachers. Along the seven domains of the National Competency-Based Teacher Standards (NCBTS), the prospective teachers revealed that the experiential learning courses had enhanced their competencies most in personal growth and professional development and least in planning, assessing and reporting. The result may help inform curriculum planners and implementers regarding the status of the new teacher education program as a way of providing continuous feedback for curriculum development. **(Author's abstract)**

Keywords: *Experiential learning, Field study courses, Field study students, Resource persons, Cooperating schools, National competency based teacher standards (NCBTS), Education*

Enriching the technological pedagogical content knowledge (TPACK) of science teachers through an enhancement training program

Abrencillo, Erwin R., Ph.D

The study was conducted to enhance the Technological Pedagogical Content Knowledge (TPACK) of selected public school science teachers in Quezon province through development of a training program. The mixed method of research design was utilized in the study wherein quantitative data and qualitative data were triangulated. The respondents were thirty (30) science teachers from Division of Lucena City, Division of Tayabas City and Division of Quezon. The weighted mean, t-test for significance and one-way ANOVA were used as statistical treatment of the data. Based on the findings, it was concluded that the respondents have sufficient knowledge in each domain of Technological Pedagogical Content Knowledge (TPACK). However, aiming to elevate higher the TPACK of science teachers, an enhancement training program was developed. Implemented to the respondents, it is valid for use and it can enhance the science teachers' TPACK level regardless of their age, sex, and teaching experience. It was recommended that science teachers may consider using the TPACK framework in order to develop their knowledge level and to enhance the teaching and learning processes. School administrators may also adapt the TPACK training program as part of their faculty development program.

Keywords: *enhancement training program, science teachers, technological pedagogical content knowledge, Education*

Luz y Saber, Volume No. 13 Issue No. 3,
2019,
(Filipiniana Analytics)

Global Competitiveness Sub-Indices as Potential Determinants of Basic Education Quality across Different Countries

Ontoy, Dexter S., Padua, Roberto

Very recent research (Felipe and Porio, 2010) revealed no direct relationship between the lengths of basic education cycles and student performance in TIMSS (2007) science and mathematics tests. The TIMSS scores were impliedly used as proxy measures of quality for basic education. The present study is an in-depth analysis of the various socio-economic factors that directly bear on the quality of basic education outcomes using the sub-indices of the Global Economic Index (GCI) 2009 in view of the assertion that a mechanical addition of more years in basic education does not improve quality at that level. Results revealed that specific basic economic parameters (connectivity and access) related to poverty reduction, efficient and effective higher education and training of teachers, technological readiness and strengthening of economic fundamentals all significantly bear on the quality of basic education globally. **(Author's abstract)**

Keywords: *Global economic index, Infrastructure, Factor-driven economy, Efficiency, Education*

CNU Journal of Higher Education, Volume No. 5 Issue No. 1, 125-137
2011,
(Filipiniana Analytics)
NP

Information literacy program for lifelong learning in higher education

Lozanta, Ana Mae Kristi

The main objective of the research is the development of an Information Literacy Program for lifelong learning. It determines the information literacy skills of tertiary students and school administrators. It defines the management competencies of the school administrators in terms of planning, organizing, controlling, and leading. The participants in the research included five hundred two (502) tertiary students and fifty-eight (58) school administrators from different universities in the National Capital Region (NCR). The study utilized the descriptive developmental research design. The results show that the information literacy skills of students are above average in the task definition, information seeking strategies, location and access, use of information, and synthesis. However, the evaluation skills are interpreted as average and need to be improved for the research activities. On the other hand, school administrators are superior in information literacy skills. They are competent in terms of their management functions. There is a significant relationship between the information literacy skills and managerial competencies of the school administrators. These are considered essential factors in creating and sustaining an information literacy program. The crafted guidelines for the management and the utilization of the Information Literacy Program for school administrators will greatly support its sustainability.

Keywords: *information literacy, management functions, lifelong learning, Education*

Enderun Colleges Scholarly Review, Volume No. 3 Issue No. 2,
2020,
(Filipiniana Analytics)

Initial Implementation of the Field Study Courses in Region VII: Teacher Education Institutions and Department of Education Collaboration

Lapingao, Nen

The study attempted to assess the status of implementation of the Field Study (FS) courses offered by the Teacher Education Institutions (TEIs) in collaboration with the Department of Education (DepED), Region VII, for the school year 2008-2009. This study presented the profile of the implementers both from the Teacher Education Institutions and the Department of Education, described the implementation schemes employed by both TEIs and DepED, ascertained the enhanced competency level of Field Study Students (FSS) along the seven domains of DepED's National Competency-Based Teacher Standards and the difficulties and problems met as well as solutions made by both sectors. The study utilized the survey questionnaires (Forms 1, 2 and 3) developed by the Philippine Association For Teacher Education (PAFTE) National organization which were administered to Region VII TEI implementers and FSS and to DepED implementers. It was found out that the FS courses in the TEIs were handled by deans and FS supervisors who were educationally qualified as well as having a sufficient length of teaching experiences. In the same vein, these courses were also handled by equally qualified administrators and resource teachers in the DepED. FS courses were to be anchored on some prescribed professional education subjects and the majority of the TEIs offered the FS courses simultaneously with these content courses with regard to scheme of implementation. It was evident that the FS students' level of competency vis-à-vis the DepED's National Competency-Based Teacher Standards (NCBTS) was enhanced, but they scored low in the domain on planning, assessment and reporting. The TEIs and the DepED encountered many problems and difficulties in FS implementation. Summarily, through the Field Study courses, the students were able to enhance their competency level along the seven domains of the NCBTS; thus, the objective of training them to apply the principles and theories learned in content courses was achieved. However, in this initial collaboration between the Teacher Education Institutions (TEIs) and the Department of Education (DepEd) in the implementation of Field Study courses, there were some aspects which both agencies had to collaboratively settle, procedures that need to be in place and problems that have to be threshed out. Though implemented, there is a need to revisit it and possibly look into these identified problematic areas for improvement. **(Author's abstract)**

Keywords: *Field study courses, Field study students, Pre service, In-service, TEI and DepED implementers, Implementation scheme, Implementation procedures, National Competency-Based Teacher Standards, Education*

CNU Journal of Higher Education, Volume No. 4 Issue No. 1, 71-83
2010,
(Filipiniana Analytics)
NP

0276

A market research study on the UST communication program offering for UST General Santos City
Pusta, Gwene

Reputation has been shown to be an important factor in assessing the worth of an organization (Gotsi & Wilson, 2001), or the value of a product (Feldwick, 1996), and it has been positioned as playing important roles in managerial behavior (Ferris, Fedor, & King, 1994) and leadership (Ammeter, Douglas, Gardner, Hochwarter, & Ferris, 2002; Blass & Ferris, 2007; Hall, Blass Ferris, & Massengale, 2004). Nevertheless, very little theory and research on corporate reputation has been reported and the nature and dynamics of how reputation is developed and its impact on social interactions has received limited attention in the organizational sciences literature (e.g., Ferris, Blass, Douglas, Kolodinsky, & Treadway, 2003).

Keywords: *market research, communication program, UST, reputation, managerial behavior, leadership, social interaction, organization, Education*

International Journal on Social Innovation & Research, Volume No. 11 Issue No. 1,
2020,
(Filipiniana Analytics)

0277

Organizational collaboration for an industry-academe symbiotic framework
Navarro, Na

This study explored the factors and constraints that promote and hinder collaboration. Taking a perspective on knowledge interaction, this project explored how formal collaborative relationships between industry and academic based environments emerge and develop, focusing on the factors, constraints, measures and common areas and scenarios of industry and academe. The study is anchored on the theory of Resource Dependency and Systems Theory.

Keywords: *collaboration, resource dependency, systems theory, Education*

Enderun Colleges Scholarly Review, Volume No. 3 Issue No. 2,
2020,
(Filipiniana Analytics)

Student Teachers' Impact on their Basic Education Students' Cognitive, Affective and Social Development

PaÁ±ares, Zosima A. , Rosaroso, Ruf

The study examined the student teachers' influence on the cognitive, affective and social development of the basic education students. The findings suggested that the presence of student teachers in the classroom had greater impact on the students' affective and social dimensions rather than their cognitive development even with the learning they had. Student teachers from TEIs with a larger population were perceived by their students to be more sociable and affectionate than those from TEIs with fewer student teachers. But the latter have a better attitude towards teaching and better workplace interactions. **(Author's abstract)**

Keywords: *Student teacher, Social skills, Work values, Work interaction, Teaching competency, Education*

CNU Journal of Higher Education, Volume No. 4 Issue No. 1, 84-97
2010,
(Filipiniana Analytics)
NP

Student Teaching Policies and Practices across Different Countries

Montalbo, Imelda C. , Pogoy, Angel

Selected student teaching practices and policies across thirty countries (30) worldwide representing developed, developing and underdeveloped nations based on a World Bank Country Classification (2009) were analyzed by a forced cluster analysis procedure. As an outcome indicator of the effectiveness of such practices, the functional literacy (at the basic education level) of the representative countries was obtained. Results showed that the student teaching practices of the countries classified as developed, developing and underdeveloped, varied significantly. Results likewise revealed that the student teaching practices of more developed nations had a significant positive impact on the outcome indicator. **(Author's abstract)**

Keywords: *Student teaching practices, Practicum, Teacher education curricula, Cluster analysis, Education*

CNU Journal of Higher Education, Volume No. 4 Issue No. 1, 54-70
2010,
(Filipiniana Analytics)
NP

Teacher engagement and performance effectiveness: keys to organizational efficiency

Comighud, Sheena M

The study examines the level of teacher engagement in relation to their job performance effectiveness in the Schools Division of Bayawan City, Negros Oriental, Region VII, Philippines.

The study examines the level of teacher engagement in relation to their job performance effectiveness in the Schools Division of Bayawan City, Negros Oriental, Region VII, Philippines.

The respondents were 90 teachers of Bayawan City. The study utilized percentage, weighted mean, Mann Whitney U test, Kruskal-Wallis test, and Spearman rank correlation coefficient.

The study follows the descriptive-correlational research design.

The survey instruments covered the engagement of the teachers in terms of five relevant areas, namely content knowledge and pedagogy, learning environment and diversity of learners, curriculum and planning, assessment and reporting, plus factors.

The salient finding revealed that the teachers' level of engagement on the five key areas was "high" as perceived by the school heads and as "very high" as assessed by the teachers themselves. The job performance rating of the respondents was rated at "very satisfactory" levels.

A strong and significant relationship was found between the teachers' level of engagement and their individual job performance effectiveness. There is also a significant difference in their engagement when respondents are grouped according to educational attainment, level of seminars attended, and position held.

Keywords: *employee engagement, job performance effectiveness, organizational efficiency, Education*

Enderun Colleges Scholarly Review, Volume No. 3 Issue No. 2,
2020,
(Filipiniana Analytics)

0281

Utilization of Graphic Organizers in Teaching Mathematics

Decin, Ma. Be

This study aimed to determine the effectiveness of graphic organizers in teaching Mathematics to college students of JRMSU during the first semester, school year 2009-2010. Researcher-made tests were used to measure the frequency of graphic organizer use by 43 algebra instructors and the effect on the performance of 339 students. The statistical tools used were mean computations, t-test, and Pearson r Product Moment Correlation Coefficient. There was a significant relationship between instructors' utilization of graphic organizers and the students' skills in Mathematics. The use of graphic organizers in other subject areas or departments, and the conduct of more researches both to explore the effects of long-term consistent exposure to its use and to measure its effectiveness on student performance using standardized test should be done. **(Author's abstract)**

Keywords: *Graphic organizers, Teaching mathematics, Critical thinking, Problem solving, Collaboration, Communicating ideas, Education*

CNU Journal of Higher Education, Volume No. 4 Issue No. 1, 24-39
2010,
(Filipiniana Analytics)
NP

Analysis of Tensile Deformation Behavior by *in situ* Neutron Diffraction Experiments of 1 GPa-grade TRIP Steels with High Elongation

Tsuchida, Noriyuki, Tanaka, Takaaki, Toji, Yuki

The better uniform elongation of the 1 GPa-grade TRIP-aided multi-phase steel with retained austenite (γ_R) shape of needle-like was discussed by *in situ* neutron diffraction experiments during tensile test. The better uniform elongation can be ascribed by not only the deformation-induced martensitic transformation of γ_R but also the deformation behavior of γ_R and ferrite phase. Especially, the tensile deformation behavior of γ_R is found to be closely associated with both of the stress-strain curve and the deformation-induced martensitic transformation of γ_R . The tensile deformation behavior of γ_R should be considered as one of the conditions to obtain better TRIP effect. **(Author's abstract)**

Keywords: *TRIP, TRIP-aided multi-phase steel, Neutron diffraction experiments, Lattice strain, Phase strain, Deformation-induced martensitic transformation, Engineering*

ISIJ International, Volume No. 60 Issue No. 6, 1349-1357
2020,
(Filipiniana Analytics)
F(S) TS300 T29 60/6 2020

Analysis of the strength of bamboo reinforced plastic bottle concrete beams for low-cost housing

Cabatuando, Johann Sn

The world consumes about a million plastic bottles a minute, with the Philippines as one of the top plastic polluters. It is currently one of the many crises that the Philippines is experiencing. Using plastic bottles in designing a reinforced concrete beam is one of the many examples in the modernization of sustainable structures. An alternative for traditional construction materials is the key point, thus, this study incorporated the use of bamboo fibers as reinforcement in replacement of steel which is known for its high cost. Bamboo is known for its low-cost, wide availability and it is well known for its diverse properties. This research intends to investigate the flexural capacity of bamboo reinforced plastic bottle concrete beams for low-cost housing, determine the potential of this model in the field of construction, and analyze its effect on cost.

Keywords: *bamboo reinforcement, steel reinforcement, concrete blocks, plastic bottles, low-cost-housing, Engineering*

Antorcha, Volume No. 6 Issue No. 2,
2019,
(Filipiniana Analytics)

An Application of Fractal Theory to Complex Macrostructure: Quantitatively Characterization of Segregation Morphology

Cao, Jianghai , Hou, Zibing , Guo, Zhongao , Guo, Dongwei , Peng, Zhiqiang , Tang, Ping

Segregation of solute elements is an inherent characteristic of alloy solidification. Macro/semi-macro segregation seriously affects the mechanical properties of the final products. High-carbon steel billets is an important base material for producing high-end rod wire, while macro/semi-macro segregation is more serious due to its high carbon element content and low distribution coefficient. In order to control the segregation defects of high-carbon steel delicately, the morphology characteristics of segregation in 82B cord steel billet (the carbon content is 0.82 wt%) produced by continuous casting were studied based on fractal theory. It is shown that segregation morphology has fractal characteristics. Different calculation methods of fractal dimension describe segregation characteristics from different angles; fractal dimension calculated by perimeter-area method (DPA) can quantitatively characterize the complexity of segregation profile, while fractal dimension calculated by the box-counting method (DBC) reflects the spatial distribution characteristics of segregation in billets. Secondary dendrite arm spacing (SDAS) mainly affects the complexity of segregation profile. In additional, negative-correlation is shown between D_{PA} and cube root of local solidification time (the fitting coefficient is 0.79). This result demonstrated the potential of D_{PA} as a parameter for estimating local solidification time of the billet in which the measurement of SDAS is difficult. **(Author's abstract)**

Keywords: *Segregation morphology, Fractal dimension, Perimeter-area method, Box-counting method, Local solidification time, Engineering*

ISIJ International, Volume No. 60 Issue No. 6, 188-1195
2020,
(Filipiniana Analytics)
F(S) TS300 T29 60/6 2020

0285

Arijo: Location-Specific Data Crowdsourcing Web Application as a Curriculum Supplement

Banusing, Justin Enrique , Cruz, Cedrick Jason , Flores, Peter John , Briones, Eisen Ed , Larroder, Aris

Smart devices are quickly becoming more accessible to the general public. With the proper tools, they can be used to supplement the work of educators. According to studies by Beeland Jr and Roussou, learning through interaction has been considered to be effective by both students and teachers. This study aimed to develop an interactive curriculum supplement for smart devices in the form of a Location-specific Data Crowdsourcing Web Application (Arijo) which teaches students how to conduct experiments and upload their results to the internet for archival purposes. Arijo was developed with a combination of the Appsheet framework, Adobe Photoshop, and Google Maps. Three core functionalities were programmed: data input/ output, data interpretation, and information dissemination. Arijo was able to perform its intended features such as recording and displaying data within specific locations, along with displaying guides on how to conduct an experiment. Arijo was able to fulfill its main objective, to be a curriculum supplement, through the aforementioned features. In the future, Arijo may be expanded to support more year levels and multiple curriculum, the Advanced Placement and International Baccalaureate systems for example, because of its modular nature. **(Author's abstract)**

Keywords: *Engineering, Data Crowdsourcing Web Application, Appsheet framework, Adobe Photoshop, Google Maps*

Publisience A Research Journal of High School Researches, Volume No. 1 Issue No. 1, 43-48
2018 May,
(Filipiniana Analytics)
Fil (S) Q76 P45 1/1 2018

Carbon Emission Reduction and Payback Analyses of a Commercial Scale Molasses-Based Bioethanol Production

Demafelis, Rex B. , Alcantara, Antonio J. , Movillon, Jovita L. , Pacardo, Enrique P. , Flavier, Maxima E. , Espaldon, Maria Victoria O. , Tongko-Magadia, Bernadette D.

Molasses is the most common feedstock for commercial bioethanol production in the country. This study aimed to determine if domestic molasses bioethanol significantly reduces greenhouse gas emissions and contributes to the climate change mitigation target of the Philippines. Using molasses as feedstock for bioethanol production and considering the current local scenario in the Philippines wherein the bioethanol plant is distant from sugar refinery and that the bioethanol plant does not have CO₂ recovery facility, the calculated carbon emission reduction is 103.50% (by equivalent fuel volume) or 105.32% (by equivalent fuel energy) compared to gasoline use. Projecting the global mitigation target by 2030, a 20% biodiesel blend means that bioethanol blend should increase to 70% .. Furthermore, carbon payback analysis indicated that carbon debt from bioethanol plant construction can be recovered by the total bioethanol life cycle savings between 4 months to 16 months (1 year and 4 months) depending on the scenario considered. **(Author's abstract)**

Keywords: *Carbon inventory, Carbon payback period, GHG emission reduction, Molasses bioethanol, Engineering*

The Philippine Journal of Crop Science, Volume No. 43 Issue No. Spl Issue, 21-28

2018 December,

(Filipiniana Analytics)

Fil (S) SB189 P45 v.43 2018

Carbothermal Reduction, Melting Separation, and Structural Analysis of Carbon-bearing Rare Earth Iron Ore Pellets

She, Xuefeng , Yi, Wanli , Ma, Tengfei , Zhang, Zhuo , Wang, Jingsong , Xue, Qingguo

The slag of rare earth Bayan Obo complex iron ore (REBOCIO) after direct reduction and melting contains a lot of rare earth elements (REEs). In this work, the isothermal reduction and melting separation experiments of REEs-bearing iron carbon composite pellets and the detailed characterization of rare earth (RE) slag were conducted, with the aim at developing knowledge of the reduction mechanism and the behavior of REEs during the direct reduction and melting process. The results indicate that the pellets can be optimally reduced at 1200°C for 15 min with a C/O ratio of 1.2. The RE-containing phases differ depending on the reaction conditions. When the temperature is relatively low at 1100°C, the major RE phase in the slag is Ce_{4.67}(SiO₄)₃O; while (Ca, Ce, La)₅(SiO₄)₆F becomes the dominant RE phase in the slag at 1400°C. The main crystalline phase in the air-cooling slag are cuspidine (Ca₄Si₂O₇F₂), (Ca, Ce, La)₅(SiO₄)₆F and fluorite (CaF₂). The particle size of the RE phase increases as the cooling rate decreases. In the case of furnace cooling, the RE phase in the slag has a more complete structure, namely hexagonal prismatic. And the RE phase is hexagonal system with space group P 63/m and unitcell parameters $a = 9.5908(3) \text{ \AA}$, $b = 9.5908(3) \text{ \AA}$, $c = 7.0268(2) \text{ \AA}$, $\beta = 90 (3)^\circ$, and $V = 559.75(4) \text{ \AA}^3$. **(Author's abstract)**

Keywords: *Bayan Obo complex iron ore, Carbon composite pellet, Direct reduction, Rare earth slag, Crystal structure, Engineering*

ISIJ International, Volume No. 60 Issue No. 6, 1141-1148

2020,

(Filipiniana Analytics)

Casting Defect and Process Optimization of Steel Crossing

Sun, Dengyue , Lv, Ruihao , Xie, Jiuming , Xu, Shimin

The casting quality of crossing in a railway turnout is required to be higher because of the significant impact load on the rail. The simulation results of using different fever risers, the temperature field, solidification process and casting defects, were obtained by the implicit finite element method based on the ProCAST software. To improve the authenticity of the visualization of the casting process, a numerical simulation assumption of the mass flow rate attenuation was proposed for the overflow of molten metal from the risers during tilt pouring. The result shows that the temperature field is more uniform when the risers with exothermic energy of 1200 kJ/kg were chosen and the defects converge to the risers in accordance with the principle of sequential solidification. Compared with insulation riser, shrinkage porosity proportion decreased from 23.10% to 17.01%, and the shrinkage cavity proportion decreased from 1.002% to 0.530%. However, changing the burned time has no obvious effect on the casting. At the same time, the process optimization scheme of risers was put forward in this study and the casting defects such as shrinkage cavity and porosity are predicted according to the 'V type' feeding area of the fever risers. This improvement has greatly improved the performance of the casting, and the passing gross tonnage could reach 300 million tons. **(Author's abstract)**

Keywords: *Railway crossing, Mass flow rate attenuation, ProCAST software, Passing gross tonnage, Engineering*

ISIJ International, Volume No. 60 Issue No. 6, 1196-1203
2020,
(Filipiniana Analytics)
F(S) TS300 T29 60/6 2020

Challenges of Water Governance in the Philippines

Rola, Agnes C. , Pulhin, Juan M. , Tabios, III, Guillermo Q. , Lizada, Joy C. , Dayo, Maria Helen F.

Using a multi-dimensional framework of governance, this paper analyzed the state of water governance in the Philippines from the legal, organizational, and operational perspectives at various governance levels. Data were taken from secondary sources and case studies done by the authors. Results showed that the many legal documents for water are a source of confusion; that water data for planning are inadequate; that there are numerous water agencies, these are not connected vertically nor horizontally; and, that these various institutions do not have sufficient human and financial resources and presence at the local level to be effective in their mandates. The authors recommend: 1) to review the legal and institutional framework for water; 2) to improve on planning and decision making mandates; and, 3) to study and implement more participatory models of water governance fitted to the Philippine context. **(Author's abstract)**

Keywords: *Customary laws, Participatory governance, Philippines, Private-community partnership, Water governance, Engineering*

Philippine Journal of Science, Volume No. 144 Issue No. 2, 197-208
2015 December,
(Filipiniana Analytics)
Fil (S) Q1 P55 144/2 2015

Coal fly ash as cement replacement on mortar mixed with Mangima stone and conventional fine aggregates

Cabahug, Ruel R. , ,

A study was conducted to investigate the characteristics of fly ash as cement replacement on mortar mixed with Mangima stone and conventional fine aggregates. Since many studies have established that coal fly ash and Mangima stone can be a good substitute for concrete aggregates, the researchers decided to create a new experiment to show the combination of the two materials on a mortar mixture. Several design mixtures were evaluated to compare the test findings. The quality tests of the Mangima stone with conventional fine aggregates and cement with different proportions of fly ash included the following: specific gravity (SSD) and absorption test and sieve analysis (gradation test). It also presents the results of the investigation carried out to evaluate the compressive strength of 1:3 mortar mixes in which conventional fine aggregates was replaced with 50% Mangima stone fine sand by weight which was further modified by partially replacing cement with six percentage ratios i.e. 0%, 20%, 40%, 60%, 80% and 100% of coal fly ash. The compressive strength was determined by three (3) trials at 7, 14 and 28 days of age. Test results revealed that the combined use of Mangima stone and conventional fine aggregates exhibited that fly ash can only be utilized as cement replacement on mortar by 20% which attained the type S mortar.

Keywords: *coal fly ash, cement replacement, mortar mix, Mangima stone, conventional fine aggregates, specific gravity, absorption test, sieve analysis, compressive strength, Type S mortar, Engineering*

Mindanao Journal of Science and Technology, Volume No. 15 Issue No. 1,
2017,
(Filipiniana Analytics)

Comparative analysis of fuzzy-neural network implementations on an autonomous electric vehicle

, Ramoso, John

The aim of this research is to implement an optimized hybrid fuzzy-neural (FN) algorithm for an autonomous electric vehicle's stop-and-go decision-making and control. Four (4) different algorithms (purely fuzzy logic (FL), one (1) hidden layer (H1) FN, two (2) hidden layers (H2) FN, and purely neural network (NN)) were deployed in a buggy-type electric vehicle (EV) to compare their performances in real road conditions. The test EV was equipped with a LiDAR Lite sensor which served as the range finder to measure headway distance while an optical flow sensor and the motor's built-in hall sensors were used to measure speed. The EV was also retrofitted with a dsPIC30F4011 microcontroller for processing and control. Both indoor and outdoor road tests were conducted to compare the difference between a controlled environment (well-lit with good road conditions) versus actual road conditions (including physical limitations), respectively. It was observed in the indoor tests that increasing the hidden layers from H1 to H2 made the algorithm more robust and decreased jerking phenomenon when the vehicle was stationary. Results from the outdoor tests also revealed that FN network with H2 (successful in eight (8) out of ten (10) runs) had better control in maintaining proper headway distance and more fluid transition in acceleration and deceleration. Hardware considerations were also outlined focusing on deploying machine learning codes and weights to a microcontroller. The ~56kB initial code size was way above the allowable 48kB program memory of the microcontroller therefore the data type of the weights were changed to shrink the code to ~38kB.

Keywords: *artificial neural networks, autonomous vehicle, fuzzy logic, fuzzy-neural network, LiDAR Lite sensor, stop-and-go decision-making, electric vehicle, prototype, road test, Engineering*

Creep Lifetime Reduction in Heat Affected Zone in Boron-Added 9Cr Heat Resistant Steel

Matsunaga, Tetsuya , Hongo, Hiromichi , Tabuchi, Masaaki , Yamabe-Mitarai, Yoko

Boron-added 9Cr-3W-3Cr-VNb ferritic/martensitic heat resistant (MARBN12) steel is the candidate material for components used at intermediate temperatures, i.e., 923 K or less, in advanced ultra-supercritical (A-USC) power generation systems because they can suppress Type IV fracture under creep conditions. For evaluation of the creep strength of the heat affected zone (HAZ), simulated HAZ samples with peak temperatures of about 1173 K, 1223 K, 1273 K, and 1323 K with a heating rate of 100 K/s and a cooling rate of 40 K/s were crept at 923 K. Compared with the conventional Gr. 92 steel, the B-added steel showed about 10 times longer creep lifetime. Furthermore, minimum creep lifetime was observed around the AC3 point of about 1223 K. Electron back-scattered diffraction analyses revealed that clear fine-grained HAZ was not formed and that martensite remained in the simulated HAZ samples of the MARBN12 steel. Microstructural change occurred only around the prior austenite grain boundary (PAGB), i.e., fine grains were formed there. It generated grain boundary sliding in the vicinity around PAGB, leading to shorter creep lifetime than the base metal. Results show that the creep lifetime around HAZ in the MARBN12 steel was affected by the microstructure near PAGB. Also, that in the Gr. 92 steel was influenced by the grain size, i.e., Type IV fracture. **(Author's abstract)**

Keywords: *B-added steel, Creep, Heat affected zone, Type IV fracture, Welding, Engineering*

Data Assimilation in the Welding Process for Analysis of Weld Toe Geometry and Heat Source Model

Shiraiwa, Takayuki , Enoki, Manabu , Goto, Sota , Hiraide, Takashi

Finite element simulations are widely conducted to evaluate the heat transfer and deformation during welding. Basically these welding simulations require input variables such as shape parameters and heat source parameters, which are not directly measured by the experimental method. In this study, two methods were proposed to obtain these input parameters more efficiently: a method of automatically identifying toe radius and reinforcement angle from height profile, and a method of estimating a heat source model in welding simulation. In the first method, the toe radius and reinforcement angle were extracted from the height profile by Akaike's information criterion. The extracted results were consistent with the manual fitting results. In the second method, the optimal combination of the heat input parameters was automatically searched by Bayesian optimization. Comparing the accumulated regrets, it was found that the probability of improvement and upper confidence bound provide more efficient optimization than the other acquisition functions in the calibration of the heat input parameters. Both temperature history and shape of fusion zone and heat-affected zone calculated at the optimized condition were in good agreement with the experimental results. These results demonstrated that the two proposed methods are effective to create a numerical model for welding simulation. **(Author's abstract)**

Keywords: *Welded joints, Residual stresses, Finite element analysis, Bayesian optimization, Fatigue, Engineering*

**A Data-Driven Multiobjective Dynamic Robust Modeling and Operation Optimization
for Continuous Annealing Production Process**
Wang, Yao , Wang, Xianpeng , Dong, Zhiming , Wang, Zan

There are many dynamic disturbances during the continuous annealing production line (CAPL) in iron and steel enterprise. Traditional robust operation optimization considers only the maximum disturbance range in previous production and overrides the dynamic changes of these disturbances, which often results in high production cost and low product quality. Therefore, this paper proposes a novel multiobjective dynamic robust optimization (MODRO) modeling method by further taking into account the dynamic changes of these disturbances and adopting a time series prediction model based on a least square support vector regression (LSSVR) to predict the range of disturbances in next time slot. The main feature of the model is that the robustness can be dynamically adjusted according to the disturbance range predicted by the LSSVR. To solve this model, an improved NSGA-II algorithm is developed based on a new crowding metric. Numerical results based on actual production process data illustrate that the proposed MODRO modeling method is obviously superior to traditional static robust operation optimization, and that it can significantly improve the strip quality and the capacity utilization of the CAPL, and reduce the total energy consumption. **(Author's abstract)**

Keywords: *Continuous annealing, Time series prediction, Dynamic robust operation optimization, Multiobjective evolutionary algorithm, Engineering*

**Decoupling Strategy and Dynamic Decoupling Model of Flatness Control in Cold
Rolling Strip**

Song, Ming-ming , Liu, Hong-min , Wang, Dong-cheng , Xu, Yang-huan

Taking a 1420 mm UCM six-high cold rolling mill as the research object, by calculating and analyzing the relative gain array of flatness adjustments, the flatness control strategy of independent control primary flatness, decoupling control quadratic and quartic flatness is proposed, which simplifies the complex three-loop decoupling to the two-loop decoupling, and facilitates the design of flatness control system. In order to overcome the shortcomings of the long response time and the process fluctuation of the static matrix decoupling control, based on the multi-input and multi-output decoupling control theory, a method and model for the whole process decoupling of quadratic and quartic flatness control loops is proposed by introducing dynamic decoupling matrix instead of static decoupling matrix. The simulation results show that the dynamic matrix decoupling control method can make the system adjust quickly and smoothly, and by controlling the primary, quadratic and quartic flatness, the cubic flatness can also be controlled effectively. This paper opens up a new way and method for developing a simple, practical and high performance flatness control system. **(Author's abstract)**

Keywords: *Flatness control, Influence matrix, Relative gain array, Static decoupling matrix, Dynamic decoupling matrix, Process decoupling, Engineering*

Design of Robust Optimal Fractional-Order Pid Controllers Using Particle Swarm Optimization Algorithm for Automatic Voltage Regulator (AVR) System
Balochian, Saeed , Baloochin, Hossein , Ramezani, Hadi

In this paper, a fractional order controller with a first-order low pass filter in derivative was designed. Since disturbance rejection is more common than set point tracking in industrial processes, the performance of the system was evaluated by its ability to reject disturbance. Moreover, a method for robust optimum tuning of fractional PID controllers for AVR system using Particle swarm optimization (PSO) algorithm was presented. Using the H_∞ -norm of a SISO linear system, condition for disturbance rejection was determined and constrained optimization problem was solved. The proposed approach with new defined fitness function has very easy implementation and has the most control performance. The influence and efficiency of the proposed method were illustrated in simulations. **(Author's abstract)**

Keywords: *AVR system, Fitness function, H_∞-norm, Robust optimal fractional-order PID controller design, Engineering*

Development, Implementation and Testing of Language Identification System for Seven Philippine Languages
Laguna, Ann Franchesca B., Guevara, Rowena Cristina L.

Three Language Identification (LID) approaches, namely, acoustic, phonotactic, and prosodic approaches are explored for Philippine Languages. Gaussian Mixtures Models (GMM) is used for acoustic and prosodic approaches. The acoustic features used were Mel Frequency Cepstral Coefficients (MFCC), Perceptual Linear Prediction (PLP), Shifted Delta Cepstra (SDC) and Linear Prediction Cepstral Coefficients (LPCC), Pitch, rhythm, and energy are used as prosodic features. A Phone Recognition followed by Language Modelling (PRLM) and Parallel Phone Recognition followed by Language Modelling (PPRLM) are used for the phonotactic approach. After establishing that acoustic approach using a 32nd order PLP GMM-EM achieved the best performance among the combinations of approach and feature, three LID systems were built: 7-language LID, pair-wise LID and hierarchical LID; with average accuracy of 48.07%, 72.64% and 53.99%, respectively. among the pair-wise LID systems the highest accuracy is 92.23% for Tagalog and Hiligaynon and the lowest accuracy is 52.21% for Bicolano and Tausug. In the hierarchical LID system, the accuracy for Tagalog, Cebuano, Bicolano, and Hiligaynon reached 80.56%, 80.26%, 78.26%, and 60.87% respectively. The LID systems that were designed, implemented and tested, are best suited for language verification or for language identification systems with small number of target languages that are closely related such as Philippine languages. **(Author's abstract)**

Keywords: *Gaussian Mixture Models, Language Identification, Speech Processing, Engineering*

Development of porous ceramic diffuser from red clay, diatomite and rice hull ash mixtures using slip casting method

Jabile, Liez

A red clay-based porous ceramic for water aeration diffuser application was produced from different compositions of Lama-Lama clay, Kapatagan diatomite, and rice hull ash. The formulations were based on the clay to silica ratio of 40/60, 45/55, 50/50, and 55/45. Low-cost additives like cornstarch and cassava starch were also added as pore formers at 15 weight percentage. Cylindrical and rectangular test pieces were made by slip casting that was fired at 1050°C and 1150°C. The solid casting of slip was done by heating in a microwave oven at 60°C and 80°C, respectively. Various tests were conducted on the fired specimens such as firing shrinkage, water absorption, apparent porosity, bulk density, specific gravity, modulus of rupture, and scanning electron microscopy. The best formulation appropriate for air diffuser was the sample with the composition of 55/45 clay to silica ratio without starch and was fired at 1050°C.

Keywords: *porous ceramic diffuser, red clay, diatomite, rice hull ash, slip casting method, clay to silica ratio, firing shrinkage, water absorption, apparent porosity, bulk density, specific gravity, modulus of rupture, scanning electron microscope, Engineering*

Distribution Characteristics and Thermal Stability of Primary Carbide in Cast Ce-H13 Steel

Huang, Yu , Cheng, Guoguang , Li, Shijian , Dai, Weixing

The primary carbide precipitated during the solidification process will act as the crack source to reduce the performance of H13 steel. It is necessary to obtain the nature of the primary carbide in H13 steel to reduce its detriment. Therefore, the distribution characteristics and thermal stability of the primary carbide in cast Ce-H13 steel were analyzed in this paper. There is a huge difference in the shape of the primary carbide between the 2D observation and the 3D observation. The shape of the primary carbide is a dendritic structure, and the branch is rich-V carbide and the trunk is rich-Ti-V carbide. The primary carbide size in the 3D observation increases gradually from the margin of the Ce-H13 ingot to the center. The rapid growth of the branch leads to an increase in size, and the decrease in the cooling rate is the main reason for the increase in size. When the heating temperature is 1150°C, the rich-V carbide starts to dissolve and dissolved completely at 1250°C. However, the rich-Ti-V carbide just starts to dissolve when the heating temperature is 1250°C. The number density and size of primary carbide decrease gradually with the increase of the heating temperature. Elemental Ce can effectively decrease the size of the primary carbide, but not for the number density. The calculated results are in keeping with the experimental observations. High-temperature heating can effectively reduce the primary carbide size, but cannot eliminate it. **(Author's abstract)**

Keywords: *Primary carbide, H13 steel, Rare earth, Thermal stability, Engineering*

Effect of Cold Rolling on Stability of HCP and FCC Phases in Fe–Mn Alloys

Okuda, Kaneharu, Xu, Xiao, Kainuma, Ryoosuke

The phase transformation behavior of an Fe–20%Mn alloy during a heating process after various cold-rolling reductions was investigated, and the phase stabilities of the γ and ϵ phases were discussed. The initial hot-rolled material was composed of an ϵ martensite matrix and a small amount of the γ austenite phase at room temperature. The deformation of the martensite alloy in the cold rolling was not homogeneous, and the microstructure of some regions was clearly adopted from that in the hot-rolled sample. Moreover, a residual γ phase was still detected even after 35% cold-rolling reduction. In the heating stage, a remarkable reverse transformation to the γ phase started at 200°C or higher, and its finishing temperature clearly increased with the rolling reduction ratio. However, the *in situ* X-ray diffraction and electron back scatter diffraction (EBSD) observations revealed that the reverse transformation had already started from the residual γ phase particles even at temperatures below 200°C. In addition, from the EBSD–image-quality map, the distribution of the dislocations was considered to remain in the γ phase even after the reverse transformation. **(Author's abstract)**

Keywords: *High-manganese steel, #949 martensite, Cold rolling, Phase transformation, in situ EBSD, Engineering*

Effect of Crystallographic Texture on Anisotropy of Mechanical Properties in High Strength Martensitic Steel

Kitsuya, Shigeki, Ohtsubo, Hirofumi, Fujita, Noriki, Ichimiya, Katsuyuki, Hase, Kazukuni

The thermomechanical control process (TMCP) is widely applied as one of the effective processes for improving the strength and toughness of steel plates. In actual application, the anisotropies of mechanical properties arising from the crystallographic texture developed during the controlled rolling process are important issues. In this study, the effect of texture on the anisotropies of mechanical properties in an experimentally manufactured YP960 MPa class steel plate was investigated. Strength varied through the plate thickness from the surface to mid-thickness. At the surface, the strength in the longitudinal direction was higher than that in the transverse direction, and in contrast, at mid-thickness, the strength in the transverse direction was higher than that in the longitudinal direction. The major components of the texture at the plate surface were $\{110\}\langle 111 \rangle$ and $\{112\}\langle 111 \rangle$, whereas those at mid-thickness were $\{332\}\langle 113 \rangle$ and $\{211\}\sim\{311\}\langle 011 \rangle$. It is considered that the texture of the plate surface was formed by shear strain in the austenite region, whereas that at mid-thickness was formed by plane strain compressive. A crystal plasticity analysis based on the initial texture information obtained experimentally revealed that the anisotropies of mechanical properties were strongly affected by the crystallographic orientation. **(Author's abstract)**

Keywords: *TMCP, Ausforming, Anisotropy, Crystallographic texture, Crystal plasticity, Engineering*

Effect of Initial Microstructure on Creep Strength of ASME Grade T91 Steel

Sawada, Kota , Sekido, Kaoru , Kimura, Kazuhiro , Arisue, Ko , Honda, Masaki , Komai, Nobuyoshi , Fukuzawa, Norihide , Ueno, Tomonori , Shimohata, Nobuaki , Nakatomi, Hitoshi , Takagi, Kenji , Kimura, Takahiro , Nomura, Kyohei , Kubushiro, Keiji

To clarify the cause of heat-to-heat variation in the creep strength of Grade T91 steels, the influence of the initial microstructure on creep strength was investigated. The distribution of chromium concentration considered to be remaining segregation was observed as corresponding to lamellar contrasts parallel to the longitudinal direction of the boiler tube. Standard deviation (SD) of ΔCr was employed as an indicator of the degree of segregation, and a good correlation was found between the SD of ΔCr and the creep rupture life at 650°C. Remaining segregation was reduced by renormalizing heat treatment at 1200°C instead of 1250°C. The creep rupture life of steel subjected to renormalizing heat treatment at 1200°C and tempering at 760°C, followed by normalizing and tempering under standard heat treatment conditions for Grade T91 steel, was prolonged by a factor of 2.3–2.8. The strengthening effect of renormalizing at 1200°C to reduce the remaining segregation was confirmed by creep tests up to about 10000 h at 600°C and 650°C. Decreases in the number density of $M_{23}C_6$ carbide particles, length of high-angle boundaries and average KAM values during creep exposure are promoted by the presence of remaining segregation. Since diffusion is enhanced by the concentration gradient of elements, degradation due to microstructural change is promoted by the presence of remaining segregation. Segregation should be reduced to obtain high creep strength with homogenized concentration of chemical composition. **(Author's abstract)**

Keywords: *Creep strength enhanced ferritic steel, T91, Creep strength, Segregation, Engineering*

Effect of Lattice Defects on Tribological Behavior for High Friction Coefficient under TCP Added PAO Lubrication in Nanostructured Steels

Tonotsuka, Kazuki , Todaka, Yoshikazu , Adachi, Nozomu , Horii, Motohiro , Toda, Kenichi , Mitsuhashi, Masatoshi , Iwasaki, Masumi , Shiihara, Yoshinori , Umeno, Yoshitaka , Nishida, Minoru , Nakashima, Hideharu

The effect of lattice defects on the tribological behavior under tricresyl phosphate (TCP) added poly- α -olefin (PAO) lubrication was investigated in the nanostructured steels produced by heavy plastic deformation processes. In surface-nanostructured SUJ2-bearing steel, tribological behavior with high friction coefficient was observed in ball-on-disk tests when compared to non-deformed steel. In addition, a similar phenomenon was observed in ultra-low carbon (ULC) steel with a high density of lattice defects (grain boundary, dislocation and so on). By increasing the density of lattice defects, a higher friction coefficient was observed. The reason for the tribological behavior with high friction coefficient seems to be that the compound film of Fe–O–P system formed in the ball-on-disk test was worn down. **(Author's abstract)**

Keywords: *Coefficient of friction, Tribology, Lattice defect, Nanostructure, Ball-on-disk test, Heavy plastic deformation, Engineering*

Effect of Magnetite on Mineral Phase Formation in Sintering Process

Wang, Ziming , Maeda, Takayuki , Ohno, Ko-ichiro , Kunitomo, Kazuya

Mineral phase formation behavior in the sintering process is one of the most important factors for quality and productivity of iron ore sinter. As resource of high-grade hematite ore is exhausting, it is expected that hematite ore can be replaced by magnetite in iron-making. So that, the purpose of this study is to investigate the effect of magnetite on mineral phase formation. To clarify the effects of magnetite on mineral phases formation, sintering experiments using hematite and magnetite reagent were carried out. To research the effects of atmosphere and temperature, samples were sintered under oxidizing (air) and reducing (CO–CO₂) atmosphere at 1250°C and 1350°C respectively. The results were analyzed by microscopic observation and image processing. Under both oxidizing and reducing atmosphere, the shapes of each phase after sintering of magnetite samples are likely to hematite samples. From the image processing results, the ratio of each phases formed after sintering of samples were at the same level. So, it is expected that magnetite can be used as raw material instead of hematite in sintering process. Under Air atmosphere, both hematite and magnetite samples formed more calcium ferrite phase when the sintering temperature was higher. Moreover, under Air atmosphere, the calcium ferrite formation ratio of both hematite and magnetite samples was larger than that of under CO–CO₂ atmosphere. Therefore, it is very important to keep oxidation state in sintering process. **(Author's abstract)**

Keywords: *Sinter, Magnetite, Mineral phase formation behavior, Temperature, Atmosphere, Engineering*

Effect of Shear Stress on Heat Transfer Behavior of Non-Newtonian Mold Fluxes for Peritectic Steels Slab Casting

Gu, Shaopeng , Wen, Guanghua , Guo, Junli , Wang, Zhe , Tang, Ping , Liu, Qiang

A new mold flux based on non-Newtonian fluid for the peritectic steels casting was prepared. The heat transfer behavior and lubrication property of this non-Newtonian mold flux were examined by heat flux simulator, ultraviolet-visible-near-infrared spectrometer (UV-Vis/NIR), Raman spectroscopy, SEM, and confocal laser scanning microscopy (CLSM), and the results were compared with the conventional mold flux used in peritectic steels casting. The results showed that the heat transfer property of liquid layer of N1 slag was reduced through the destruction of silicate network structure by shear stress. Compared with the data obtained under static and stirring conditions, the q_{\max} and degree of polymerization (DOP) of N1 slag were reduced from 0.921 MW/m², 0.728 to 0.716 MW/m², 0.583, respectively. However, the shear stress has no effect on the heat transfer property of liquid layer of N0 slag. Second, the heat transfer properties of solid slag layer of N0 and N1 slag were all inhibited through increasing the crystallization rate, crystallization fraction, and slag film thickness by shear stress. While, under stirring condition, the slag film thickness and t_2 of N1 slag was lower than that of N0 slag. Third, the heat transfer behavior of air gap layer of N0 and N1 slag were all controlled by shear stress. The surface roughness (Ra) and shedding time of N0 and N1 slag with agitation were increased to 54.49 μm , 61 s and 52.87

um, 59 s, respectively. Finally, the break temperature of N1 slag was 9 K lower than that of N0 slag. **(Author's abstract)**

Keywords: *Non-Newtonian slag, Heat transfer performance, Shear stress, Peritectic steels casting, Crystallization, Engineering*

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0306

Effect of Silicon, Manganese and Heating Rate on the Ferrite Recrystallization Kinetics *Shah, Vitesh , Krugla, Monika , Offerman, Sven Erik , Sietsma, Jilt , Hanlon, David Neal*

This study presents the effects of silicon (Si) and manganese (Mn) concentration and of heating rate on the ferrite recrystallization kinetics in seven model alloys with different Si and Mn concentrations, which are of relevance for the development of Advanced High Strength Steels (AHSS). The recrystallization kinetics were studied with *in-situ* 2D X-ray Diffraction (2D-XRD) and ex-situ microstructure observations using Scanning Electron Microscopy (SEM). The experimentally observed differences in the recrystallization start temperature (T_s), dependent on the Si and Mn concentrations and the heating rate, can be described by combining the non-isothermal JMAK-model with a modified version of Cahn's solute drag model. The modified Cahn model takes into account – in an approximate manner – that the interaction energy of the solute atoms with the grain boundary depends on the Si and Mn concentrations in the boundary and the Wagner interaction parameters. The collective contribution of the Si and Mn atoms to the increase in the T_s with respect to the reference alloy (without Si and with very little Mn) is higher than would be expected from the simple addition of the effects of the Si and Mn concentrations alone. This means that the interaction between Si and Mn atoms leads to an additional increase in T_s , *i.e.* a coupled solute drag effect. For the later stages of recrystallization, we have studied the change in the number density and the growth rates of the recrystallizing grains using SEM. The observations show non-random nucleation, early impingement of the grains in the normal-direction and non-constant growth rates of recrystallizing grains. **(Author's abstract)**

Keywords: *Ferrite recrystallization, Recrystallization start temperature, Coupled solute drag, Manganese, Silicon, Engineering*

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0307

Effect of Single Power Two Circuits Electroslag Remelting Process on the Cleanliness of the Remelted Ingot

Cao, Haibo , Jiang, Zhouhua , Dong, Yanwu , Liu, Fubin , Hou, Zhiwen , Yao, Kean , Yu, Jia

Single power two circuits electroslag remelting process with current carrying mould (ESR-STCCM) has been developed to remelt high alloy. In the present work, the laboratory experiments, physical simulations and numerical simulations were set up to systematically investigate the droplet size and cleanliness of the remelted ingot for ESR withdrawing process (ESRW) and ESR-STCCM. The results indicated that ESR-STCCM can change the distribution of electromagnetic force, thereby reducing the droplet size in the case of the same remelting power. ASPEX explorer was utilized to investigate the non-metallic inclusions of the remelted ingot for

different remelting processes, and the result indicated that the types of the non-metallic inclusions for the different remelting processes were not changed, however, the number decreased by 42.3% for ESR-STCCM. Compared with the ESRW, the deoxidation ability of ESR-STCCM increased by 10.7% meanwhile, the desulfurization ability increased by 24.5%. **(Author's abstract)**

Keywords: *Electroslag remelting, Single power two circuits, Current carrying mould, Cleanliness, let size, Engineering*

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0308

Effects and optimization of aggregate shape, size, and paste volume ratio of pervious concrete mixtures

Corpuz, Ma. Patricia Leriezz

Pervious concrete has been widely used in other countries due to its environmental benefits such as water quality improvement and high permeability. However, due to its high void content, this type of concrete has a significantly lower compressive strength compared to conventional impermeable concrete. In the Philippines, the use of pervious concrete is minimal. To achieve its most effective performance, this paper aims to optimize pervious concrete mixtures in terms of permeability and compressive strength by varying aggregate shape, size, and paste volume (PV) to inter-particle void ratio (IPV). The effect of viscosity modifying admixture (VMA) on the permeability and compressive strength was also quantified. The optimized mix consists of single graded 9.5 mm, angular aggregates with 70.90% PV/IPV. This proportion can produce a compressive strength of 17.95 MPa and a permeability of 1.35 mm/s, applicable for low-traffic pavements such as parking lots. Adding VMA increased the compressive strength by 23.74% and decreased permeability by 35.49%.

Keywords: *pervious concrete, permeable concrete, paste volume, strength, void ratio, viscosity modifying admixture, Engineering*

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0309

Effects of Alloy Elements on Carbon Partitioning in Early Stages of Proeutectoid Ferrite Transformation in Low Carbon Mn–Si Steels

Yamashita, Takako , Enomoto, Masato , Tanaka, Yuji , Matsuda, Hiroshi , Okuda, Kaneharu

Controlling the carbon concentration and distribution among constituent phases is one of the most important issues for achieving high strength and ductility in the design of steel. The carbon distribution near the α/γ interface in the early stage of isothermal holding at 750°C was measured and visualized in Fe–C–Mn–Si alloys containing 2 mass% Si and 1.5 or 2 mass% Mn using a high precision FE-EPMA developed recently by the authors, and the results were compared with the theory of ferrite growth in multi-component low alloy steel. The carbon concentrations at α/γ interfaces in austenite were generally between the NPLE/PLE and paraequilibrium $\alpha/(\alpha + \gamma)$ boundary concentrations. In alloys with carbon contents smaller than the NPLE/PLE boundary, the α/γ interfaces appeared to migrate under a condition close to paraequilibrium or with partially developed spikes of alloy elements

in the early stages. On the other hand, in alloys with a bulk composition on the boundary and its higher carbon concentration side, Mn enrichment was observed at the interfaces, and the carbon concentrations tended to be higher than those in alloys with lower carbon contents, albeit there were variations at individual interfaces. **(Author's abstract)**

Keywords: Ferrite transformation, Local equilibrium, Paraequilibrium, Computational microstructure prediction, High tensile low alloy steel, Engineering

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0310

Effects of Temperature and Phase Transformation on Post-buckling Behavior of Non-oriented Electric Steel during Hot Finishing Rolling
Liu, Chao , He, Anrui , Mi, Zhenli , Sun, Wenquan , Song, Yong

The traditional buckling model is based on the assumption of homogeneous material. However, for non-oriented electrical steel with high-temperature phase transformation, the transverse differences of temperature and phase transformation during the hot finishing rolling result in uneven distribution of material properties in the dual-phase region. In order to study the effect of inhomogeneous material on the post-buckling behavior of strip, the relationships between tangent modulus and temperature in the austenite region and ferrite region are firstly obtained by hot compression experiments. Secondly, the transverse distribution function of tangent modulus is calculated according to the distributions of temperature and phase structure in the dual-phase region. Finally, the large deflection theory of thin plate is modified, and the elastic modulus constant is replaced by the distribution function of tangent modulus. The post-buckling model considering inhomogeneous material is established to analyze the effect of temperature and phase transformation on the wave height. The results show that strip thickness and tension have great effect on the post-buckling deformation of global longitudinal wave, but little effect on local longitudinal wave. The temperature drop and phase transformation at the strip edge have no significant effect on the wave heights of global and local center waves, but they reduce the wave heights of global and local edge waves by 6% and 20%, respectively. **(Author's abstract)**

Keywords: Temperature, Phase transformation, Post-buckling, Hot finishing rolling, Non-oriented electrical steel, Engineering

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0311

Energetics and Environmental Assessment of a Commercial Scale Bioethanol Processing Plant using *Sargassum* spp.
Gatdula, Kristel M. , Rex B. Demafelis,, Hourani,Klarenz A. , Movillon, Jovita L , Sanchez, Denise Ester S. , Magadia, Jr., Richard V.

This study details the energetics and environmental analysis of a commercial plant capable of producing 30 million liters of ethanol per year using seaweed *Sargassum* spp. as feedstock. Two scenarios were considered depending on the substrates used for ethanol production. Scenario 1 utilized the alginic acid, mannitol and the cellulose contents of the seaweeds. Scenario 2 employed only the substrates mannitol and cellulose. The total energy

expenditures for Scenario 1 were 582,257.06 GJ yr⁻¹ and 162,334.73 GJ yr⁻¹ for Scenario 2. The energy output for Scenario 1 was 1,054,097.04 GJ yr⁻¹ and 1,060,058.01 GJ yr⁻¹ for Scenario 2. Energy ratio was 1.81 for Scenario 1 and 6.53 for Scenario 2. Based on these results, Scenario 2 is more energy efficient than Scenario 1. Scenario 2 has an equivalent energy potential of 638,257.98 GJ yr⁻¹ displacing 0.66 L of gasoline for every 1 L of bioethanol. Considering the electricity surplus, its greenhouse gas (GHG) reduction potential based on its annual emissions can be as high as 86.44% and based on gasoline offset, can reach up to 60.33%. If electricity surplus is not considered, the GHG reduction potential would still be high at 76.49% based on annual emissions and 68.17% based on gasoline offset. **(Author's abstract)**

Keywords: *Alginic acid, Cellulose, Cost, Energetics, Macroalgae, Mannitol, Sargassum, Engineering*

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0312

Energy Neutral Phosphate Fertilizer Production Using High Temperature Reactors: A Philippine Case Study

Haneklaus, Nils , Reyes, Rolando , Lim, Wendy G. , Tabora, Estrellita U. , Palattao, Botvinnik L. , Petrache, Christina , Vargas, Edmundo P. , Kunitomi, Kazuhiko , Ohashi, Hirofumi , Sakaba, Nariaki , Sato, Hiroyuki , Goto, Minoru , Yan, Xing , Nishihara, Tetsuo , Tulsidas, Harikrishnan , Reitsma, Frederik , Tarjan, Sandor , Sathrugnan, Karthikkeyan , Jacimovic, Radojko , Birky, Brian K. , Al Khaledi, Nahhar , Schnug, Ewald

The Philippines may profit from extracting uranium (U) from phosphoric acid during fertilizer production in a way that the recovered U can be beneficiated and taken as raw material for nuclear reactor fuel. Used in a high temperature reactor (HTR) that provides electricity and/or process heat for fertilizer processing and U extraction, energy-neutral fertilizer production, an idea first proposed by Haneklaus et al., is possible. This paper presents a first case study of the concept regarding a representative phosphate fertilizer plant in the Philippines and exemplary HTR designs (HTR50S and GTHTR300C) developed by the Japan Atomic Energy Agency (JAEA). Three different arrangements (version I-III), ranging from basic electricity supply to overall power supply including on site hydrogen production for ammonia conversion, are introduced and discussed. **(Author's abstract)**

Keywords: *Energy neutral, High temperature reactors (HTRs), Philippines, Phosphate fertilizer production, Uranium extraction, Wet acid process, Engineering*

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0313

Erosion of Carbon Brick by Zinc in Hearth of Blast Furnace

Deng, Yong , Lyu, Qing , Zhang, Jianliang , Jiao, Kexin

The service life of a blast furnace (BF) is affected by the accumulation of zinc. To clarify the erosion mechanism of the carbon bricks, due to the zinc action, a dissection investigation of a commercial BF was carried out. The results show that the zinc content reaches up to 10.59% in the tuyere coke. The carbon bricks were sampled in a region characterized by high erosion levels and molten iron was detected. More interestingly, zinc was detected between the molten iron and the carbon bricks: the high zinc content of the bosh gas of the BF induces the zinc

vapor to penetrate into the molten iron surface. The zinc vapor and the molten iron mix together, and zinc migrates from the molten iron into the carbon bricks. The thermodynamic behavior of zinc was analyzed and the volume expansion rate (56.94%) was calculated when Zn oxidizes into ZnO. The oxidation process may be the main reason behind the carbon brick erosion. The results show that molten zinc flows to the brittle layer of the carbon bricks, and finally solidifies, the carbon bricks become easy to break at the brittle layer. Countermeasures to reduce the harm of zinc have been suggested based on the zinc balance calculation. **(Author's abstract)**

Keywords: Blast furnace, Hearth, Zinc, Carbon brick, Erosion mechanism, Engineering

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0314

Ethanol Fermentation of Sweet Sorghum SPV 422 (*Sorghum bicolor* L. Moench) Syrup *Lit, Fernando C. , Movillon, Jovita L. , Guerrero, Gino Apollo M. , Gatdula, Kristel M.*

To evaluate the potential of sweet sorghum as an alternative feedstock for bioethanol production, the effects of various parameters such as type of yeast, initial °Brix, inoculum loading, and sterilization on the ethanol fermentation of sweet sorghum (SPV 422) syrup were determined. The performance of three species of *Saccharomyces* (*S. bayanus*, *S. carlsbergensis*, *S. ellipsoideus*) was evaluated. The most exceptional rate of fermentation was observed with *S. bayanus*, reaching essential completion in 24 hr. By following the experimental matrix, the study found that an initial sugar concentration of 20 °Brix and an inoculum loading of 10% v v⁻¹ were best for fermenting the syrup using the yeast *S. bayanus*. Also, under similar parametric conditions, this study determined that the unsterilized syrup yielded a higher ethanol concentration in a shorter period of time than the sterilized samples. Among all runs, the highest ethanol concentration observed was 9.6% v v⁻¹. **(Author's abstract)**

Keywords: Bioethanol, Biofuels, Fermentation, Sterilization, Sweet sorghum, Engineering

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0315

Ethanol Fermentation Performance of Acid-Tolerant *Saccharomyces cerevisiae* TB3 in Sugarcane Molasses *Garing, Clare L. , Abrigo, Jr., Casiano S. , Pajares, Irene G. , Elegado, Francisco B.*

Contamination problem is one of the major challenges of industrial ethanol production. The usual solution to minimize this problem is by lowering the pH of the fermentation broth which adversely affects yeast strains having low tolerance to acidic environments. In this study, an acid-tolerant and high-ethanol producing strain, *Saccharomyces cerevisiae* TB3 from BIOTECH-UPLB, was evaluated for its ethanol fermentation performance and was compared to an industrial strain *S. cerevisiae* HBY3 using 2³ full factorial experimental design. Fermentation was conducted at initial pH values of 3.0 and 4.5 using blackstrap molasses medium. Effect of bacterial contamination was also investigated by spiking with *Leuconostoc mesenteroides*. Monitoring of CO₂ gas production was performed to observe fermentation progress by periodic weighing of fermentation set-ups. Final ethanol concentration was measured using gas chromatography.

Results of ANOVA using Design Experts Software showed that fermentation pH had significant effect on the ethanol performance of the two strains. Bacterial contamination had significant effect on ethanol performance at initial pH of substrate at 4.5 pH but none at pH 3.0. Highest fermentation performance values were observed from *S. cerevisiae* TB3 which proved its remarkable potential as an alternative strain for industrial scale fermentation with highest attained value of ethanol produced at 11.53% (v v⁻¹) or 90.97 g L⁻¹, overall fermentation efficiency of 88.91% and high volumetric ethanol productivity of 2.74 g L⁻¹ h⁻¹ even after only 24 hr. **(Author's abstract)**

Keywords: *Acid-tolerance, Ethanol fermentation, Saccharomyces cerevisiae, Sugarcane molasses, Engineering*

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0316

Evolution of Bonding Interface during Ultrasonic Welding between Ni and Steels with Various Microstructure

Lin, Jhe-Yu , Nambu, Shoichi , Koseki, Toshihiko

In this study, Ni was bonded with steels having various microstructures to investigate the effect of various microstructures in steels on the bonding strength evolution by ultrasonic welding. It is found that at Ni/ferrite interface having similar hardness, the bonding can be produced by flattening of wear particles generated from the abrasion during ultrasonic welding to obtain a higher degree of plastic deformation, which is positive to bonding strength evolution. As for Ni/pearlite and Ni/martensite interfaces having dissimilar hardness, the bonding formation is difficult due to the presence of hard phases that limit the degree of plastic deformation near the interface, and Ni fragments are attached on the steel side. As a result, lower bonding strength evolution is correspondingly obtained due to slower increment of bonded area, whereas longer time is required for bonding formation between attached Ni fragments and the base metal Ni. **(Author's abstract)**

Keywords: *Ultrasonic welding, Microstructure, Hardness, Steel, Engineering*

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0317

Experimental and Numerical Investigations of Turbulent Flow in a Staggered Tube Bundle

Matsushita, Yohsuke , Hagiya, Hideto , Aoki, Hideyuki

Experimental and numerical investigations were carried out on turbulent flow in a staggered tube bundle. In the experiment, a hot-wire anemometer was employed to investigate the developments of the flow at the Reynolds number of 9160. In microscopic numerical study, the standard *k-ε* model was used with a boundary fitted coordinate system to calculate velocity, pressure drop and kinetic energy of turbulence. The new macroscopic turbulence model with volume averaging and additional source terms was proposed for turbulent flows in tube bundles or packed beds. The turbulence constants were determined by the microscopic numerical experiments.

The microscopic and macroscopic numerical results were in good agreement with the experimental results, or the empirical equation in the axial velocity and kinetic energy of turbulence. **(Author's abstract)**

Keywords: *Turbulent flow, Tube bundle, Packed bed, Turbulence model, Boundary fitted coordinate, Engineering*

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0318

Fabrication of Sugarcane Bagasse Based Mesh as an Adsorbent of Copper (Cu²⁺) Metal Contaminant for Wastewater Treatment

Bayer, Jr., Rex, Farinas, IV, Serafin, Navarra, Justine, Yurralde, Raphael Eric

Water pollution is one of the main problems faced in the present due to contaminants from industrial areas discharged to the environment such as toxic heavy metals. Sugarcane bagasse as a raw waste material can be utilized to adsorb known metal contaminants such as copper. In this study, the percent reduction of the fabricated bagasse mesh was investigated. The testing of the product involved exposure of the mesh to known concentrations of synthesized wastewater. The final concentrations were then analyzed using the UV-Vis spectrophotometer. Results show that the mean of percent reduction amongst 5 replicates is 37.2-31.5 percent. Certain parameters, such as contact time and pore size, affect the adsorption rate of the mesh yielding low in value. From these results, it is concluded that sugarcane bagasse based mesh is viable for copper adsorption. Modifications is recommended to further increase the adsorption rate of the product. **(Author's abstract)**

Keywords: *Copper, Sugarcane Bagasse, Wastewater Treatment, Engineering*

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0319

A Finite Element Simulation for Induction Heat Treatment of Automotive Drive Shaft

Park, Siwook, Kim, Dong-Wan, Kim, Jong-hyung, Lee, Si Yup, Kwon, Dongil, Han, Heung Nam

A finite element model was developed to predict deformation, temperature, phase fraction and hardness during heat treatment of an automotive drive shaft. The heat generation due to induction was treated as one of the boundary conditions for heat flux on the specimen together with the conduction heat loss during quenching. As for diffusional transformation, the transformation kinetics were modeled by Johnson-Mehl-Avrami-Kolmogorov equation, whereas the Marburger equation was used for displacive martensitic transformation. The transformation plasticity was considered through the constitutive equations corresponding to each transformation mechanism and these equations were incorporated into the finite element model. Besides the transformation plasticity, an implicit procedure to calculate the thermo-elasto-plastic deformation was implemented in the model. The prediction accuracy for phase evolution, residual stress, hardness and dimensional change of the specimen was verified from the measured data. The effect of transformation plasticity on whole deformation behavior was described by the developed model. **(Author's abstract)**

Keywords: *Induction heating, Transformation plasticity, Finite element simulation, Residual stress, Hardness, Engineering*

Formation Mechanism of Dislocation Walls during Cyclic Deformation in an Fe–Si Alloy

Shuto, Hiroshi , Tanaka, Yuhei , Miyazawa, Tomotaka , Arai, Shigeo , Fujii, Toshiyuki

Low-cycle fatigue tests of a polycrystalline Fe–3 mass%Si alloy were performed at room temperature under a constant total strain amplitude of 1×10^{-2} . Dislocation structures were observed by high-voltage scanning transmission electron microscopy. The development of dislocation walls parallel to (110) started during the first few tens cycles of fatigue. The activation of a set of double slip systems, (211)[11 1] and (11 2)[111], contributed to the formation of (110) walls. The (110) walls lie in the directions bisecting the angles between the Burgers vectors of the two active dislocations of the double slip systems. **(Author's abstract)**

Keywords: *Fatigue, Cyclic deformation, Dislocation structure, Wall structure, Labyrinth structure, Iron, Steel, Silicon, High-voltage scanning transmission electron microscopy, Engineering*

Greenhouse Gas Emission Reduction Potentials of Bioethanol Production and End-Use in the Philippines at Varying Sugarcane Yields: An *Ex-Ante* Analysis

Tongko-Magadia, Bernadette D. , Demafelis, Rex B. , Mendoza, Teodoro C.

The Philippine sugar industry aims to increase its productivity and efficiency as well as maximize the utilization of sugarcane resources. Aside from sugar, bioethanol, having a captive market as mandated under Biofuels Act of 2006, is another product that can be processed from sugarcane. This paper examined the effects of increasing sugarcane yields at the farm level to the greenhouse gas (GHG) emission reduction potential of bioethanol in the Philippines. Data on sugarcane cultivation practices were obtained from available and credible Philippine-specific secondary sources. Typical small farms in the country which yield only about 40 TC ha⁻¹ or in some cases approximately 65 TC ha⁻¹ have an equivalent GHG emission reduction of 131.86 and 154.08%, respectively. When sugarcane farms are managed properly resulting in 90 TC ha⁻¹ sugarcane yield, GHG emission reduction can increase to 161.56%. In addition, using location-adapted variety and good agronomic practices, the GHG emission reduction potential of bioethanol can further increase to about 169.06%. The results of this study suggest that the efforts of the government to increase sugarcane farm productivity to accommodate bioethanol production is in line with the thrust towards GHG emission reduction of the country, particularly the transportation sector. **(Author's abstract)**

Keywords: *Philippine bioethanol GHG emissions, Sugarcane bioethanol, Sugarcane yield sensitivity analysis, Engineering*

Identification, Selection and Prioritization of Key Performance Indicators for the Improvement of Occupational Health (Case Study: An Automotive Company)

Vosoughi, Shahram , Chalak, Mohammad Hossein , Yarahmadi, Rasoul , Abolaghasemi, Jamileh , Alimohammadi, Iraj , Ahmadi kanrash, Fakhradin , Pourtalari, Mehran

Regarding the important role of occupational health in the continuous improvement of organizations, the aim of this study was to identify, select and prioritize key indicators for improvement of occupational health in an automotive company. This cross-sectional descriptive study was carried out in three stages. First, a semi-structured interview as well as an inspection and a review of the company's documentation and studies were carried out, and a set of key indicators were identified and selected. Then, the validity of the indicators were determined by experts (N = 11). Following that, the indicators were prioritized based on SMART criteria. Following the study framework, we collected a set of indicators that included 45 health indicators and 17 educational ones. The results of examining their content validity showed that among the 45 primary health indicators and 17 educational ones, 12 and 9 indicators had acceptable validity, respectively, and a total of 21 indicators were suggested for the purpose of the study by the expert team. The results of prioritizing showed that the leading indicator such as the percentage of corrective and preventive health actions done with the weight of 0.146 was the first priority. A set of key indicators was proposed according to the results, based on the objective of the study, which can help managers and industrial hygiene experts to assess performance in the automotive industry. **(Author's abstract)**

Keywords: Occupational health, Health, Identification, Industry, Engineering

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Influence of Microstructure Evolution on Reheat Cracking Behavior of T23 Steel Weld Joint

Xu, Mengjia , Liu, Bosheng , Dong, Zhibo , Wang, Zhenmin

In this work, T23 steel was treated by two thermal cycles, to simulate the second heating process in coarse grained heated affected zone (CGHAZ) of weld. Meantime, the effect of microstructure evolution on reheat cracking sensitivity was investigated by using strain-to-fracture (STF) tests. It was found that the second thermal cycle procedure could alter the grain boundary network of prior austenite grain boundaries (PAGBs) of CGHAZ. The extent of boundary evolution was dependent on the peak temperatures of the applied thermal cycles. Kernel average misorientation (KAM) and fracture surface observation was applied to analyze plastic deformation and fracture mode after STF tests. The relevancy between the grain boundary character and reheat cracking sensitivity were analyzed quantitatively using fractal analysis. The results showed that the zigzag configuration of the PAGBs with larger fractal dimension could prevent the reheat crack from propagating and reduce reheat cracking susceptibility. The increase of the peak temperature of the second thermal cycle would lead to grains coarsening and straight grain boundaries, which improve the reheat cracking sensitivity for the reheated CGHAZ in T23 steel. **(Author's abstract)**

Keywords: Reheat cracking, Recrystallization, Grain boundary, Second thermal cycle, Engineering

***In-situ* Measurements of Solute Partition Coefficients between Solid and Liquid Phases in Fe–Cr–Ni–Mo–Cu Alloys during Solidification**

***Kobayashi, Yusuke , Dobara, Kento , Todoroki, Hidekazu , Nam, Cheolhee , Morishita, Kohei , Yasuda,
Hideyuki***

The *in-situ* measurements of the solute partition coefficients, *k*, between the solid and liquid phases in Fe–Cr–Ni–Mo–Cu alloys were conducted using X-ray transmission imaging and X-ray fluorescence spectroscopy (EDS) in a synchrotron radiation facility, SPring-8.

A nearly planar solid/liquid interface was achieved in a furnace with a temperature gradient (5–10 K/mm) using X-ray transmission imaging. The measurement points in the solid and liquid phases and close to the solid/liquid interface were determined by X-ray imaging. The compositions of the solid and liquid phases were measured by EDS. The solute partition coefficients along the solidification path in the Fe - 19.89–25.82mass% Cr - 24.73–34.81mass% Ni - 4.46–10.28mass% Mo - 1.47–5.79mass% Cu alloy were determined at 56 different liquid compositions. At the beginning of solidification, the partition coefficients of Cr, Ni, Mo and Cu were 0.96, 0.97, 0.70 and 0.86, respectively. The partition coefficients of Cr and Ni were almost constant during the unidirectional solidification. The partition coefficient of Mo gradually changed from 0.7 to 0.6, leading to a severe microsegregation at the end of solidification. In contrast, the partition coefficient of Cu was dispersed in the range from 0.8 to 0.9. This study demonstrated that the *in-situ* measurement was effective for systematic measurement.

(Author's abstract)

Keywords: *Partition coefficient, Solidification, Microsegregation, Stainless steel, X-ray imaging, X-ray fluorescence analysis, Engineering*

***In-situ* Phase Identification of Crystallized Compound from $2\text{CaO}\cdot\text{SiO}_2\text{--}3\text{CaO}\cdot\text{P}_2\text{O}_5$ Liquid**

Suzuki, Masanori , Nakano, Sho , Serizawa, Honami , Umesaki, Norimasa

In dephosphorization process in steelmaking, phosphorus in molten iron is distributed into molten slag after oxidized, and it forms $3\text{CaO}\cdot\text{P}_2\text{O}_5$. It has been known that dicalcium silicate ($2\text{CaO}\cdot\text{SiO}_2$) formed in molten slag and $3\text{CaO}\cdot\text{P}_2\text{O}_5$ make a solid solution, which could promote dephosphorization efficiency from molten iron. It has been reported that $2\text{CaO}\cdot\text{SiO}_2\text{--}3\text{CaO}\cdot\text{P}_2\text{O}_5$ solid solution (α phase) is formed for entire composition range at higher temperatures than 1673 K, and many previous studies on dephosphorization behavior assumed that the α phase would be precipitated from molten slag. However, we found that the α phase cannot be obtained at low phosphorus concentrations when the pellet of $2\text{CaO}\cdot\text{SiO}_2$ and $3\text{CaO}\cdot\text{P}_2\text{O}_5$ powders mixture is annealed and quenched to room temperature. In this study, we conduct high temperature *in-situ* X-ray diffraction analysis to the aerodynamically levitated sphere of the $2\text{CaO}\cdot\text{SiO}_2\text{--}3\text{CaO}\cdot\text{P}_2\text{O}_5$ liquid to identify primary crystallized phase. It has been verified that the α phase is precipitated from the liquid for wide phosphorus concentrations. In addition, a rapid phase transition of the $2\text{CaO}\cdot\text{SiO}_2\text{--}3\text{CaO}\cdot\text{P}_2\text{O}_5$ solid solution has been detected by the time-division X-

ray diffraction with high resolutions when the levitated sample containing the α phase is quenched from the precipitated temperature. **(Author's abstract)**

Keywords: *Dephosphorization, 2CaO·SiO₂-3CaO·P₂O₅ solid solution, High temperature in-situ X-ray diffraction, Aerodynamic levitation, Crystallization, Engineering*

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0326

From Iron Ore to Crude Steel: Mass Flows Associated with Lump, Pellet, Sinter and Scrap Iron Inputs

Harvey, L. D. Danny

This paper presents mass accounting models that trace the flow of major individual elements from iron ore through to iron lumps, pellets or sinter, the transformation of these intermediate products into pig iron (PI) or direct reduced iron (DRI), and the transformation of PI and DRI into crude steel in a basic oxygen furnace (BOF) or electric arc furnace (EAF) with the addition of scrap iron or steel or varying purity. Account is taken of non-iron oxides (gangue), addition of fluxes, the production of slag, and iron losses in slag. Simple relationships are developed giving the flux requirements for and slag production from a BF for various iron inputs, and relationships are developed giving flux requirements, the production of slag, and iron yield as a function of the proportions of PI, DRI and scrap inputs to a BOF or EAF. The mass and flow analysis presented here, and the energy flow analysis presented in a companion paper, provides a foundation for tracking the impact on energy use and iron losses of alternative pathways that might be used in the future as part of a broad-based effort to reduce energy use and associated greenhouse gas emissions. **(Author's abstract)**

Keywords: *Iron and steel production model, Iron and steel mass flow, Lump ore model, Pelletizing model, Sintering model, Engineering*

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0327

Kinetics of CO Gas Dissolution into Stirred Liquid Fe at 1823 K and Its Impact on Nozzle Clogging during Continuous Casting

Lee, Joo-Hyeok, Kang, Youn-Bae

CO gas generated by a carbothermic reaction in Submerged Entry Nozzle (SEN) can reoxidize an Ultra Low C (ULC) steel during continuous casting. When Ti presents in the ULC steel, the CO gas oxidizes the liquid steel and Fe₂O-Al₂O₃-TiO_x liquid oxide mixed with solid alumina forms at the interface between the steel and the nozzle. The reoxidation is partly responsible for the nozzle clogging. In the present study, the kinetics of CO gas dissolution into liquid Fe at 1823 K was investigated in order to understand how fast the reoxidation occurs, which is responsible for the liquid oxide formation and the nozzle clogging. A series of gas-liquid reaction experiments were carried out under various conditions (gas flow rate, stirring speed, the partial pressure of CO). Dissolved C and O contents in the liquid Fe were analyzed in order to find possible rate controlling step. It was found that a gas phase mass transfer is a possible rate controlling step at low rate of CO gas supply if the flow rate (Q) is lower than 0.75 L min⁻¹, which is thought to be higher than the actual CO gas supply rate in a typical SEN (~0.15 L

min⁻¹, volume corrected at room temperature). Therefore, the reoxidation is limited by the supply of CO gas to liquid steel. Decreasing CO gas generation from the nozzle is recommended to suppress the nozzle clogging. **(Author's abstract)**

Keywords: *CO(g) = C+O, Reoxidation, Nozzle clogging, ULC steel, Engineering*

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0328

Macroalga Species Prioritization for Sustainable Bioethanol Production using Calibrated Fuzzy AHP and Grey Relational Analysis

Eusebio, Ramon Christian P. , Ventura, Ruby Lynn G. , Promentilla, Michael Angelo B. , Ventura, Jey-R S.

The macroalgae as biomass for biofuel production has been gaining wide attention because it is non-food competitive, lignin-free, has high carbohydrate content, and has no land and freshwater requirement. In the Philippines, its potential to supply bioethanol using macroalgal biomass is quite high since it is an archipelagic and tropical country. Our work thus proposes a decision model based on calibrated fuzzy analytical hierarchy process (CFAHP) and grey relational analysis (GRA) to identify the suitable and sustainable macroalga species to be used in bioethanol production. Indication suggests from our case study that the domain experts weighted the economic criterion as the highest compared to the environmental and social criteria. Moreover, the biomass yield sub-criterion was ranked first in the normalized weight of all the sub-criteria, followed by biodiversity, and wildlife. Results from the prioritization via GRA indicate that the brown and red macroalgal species (*Sargassum* spp. > *Turbinanria* spp. > *Gracilaria* spp. > *Kappaphycus* spp.) were the biomass choice for sustainable bioethanol production. Sensitivity analysis also revealed that *Sargassum* spp. is still the best biomass for bioethanol production when the weights of biomass yield and bioethanol conversion were increased. Insights derive from this study can aid policy makers, academia, and research communities in the prioritization of the best macroalgal biomass for bioethanol or biofuel conversion. **(Author's abstract)**

Keywords: *Anaerobic digestion, Biogas production, Chemical oxygen demand, Swine manure, Engineering*

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0329

Management information system for smart agriculture (MISSA) soil sensing in Initao, Misamis Oriental

Pecson, Roland Joshua S.

The present practice in the Department of Agriculture 10 (DA 10) involved a conventional process of data collection in the farms, relying mainly on the farmer's perception which causes inconsistency. Given the seen gap, this study on the Management Information System for Smart Agriculture (MISSA) Soil Sensing System was conducted. It is an approach to modernize the determination of the nitrogen, phosphorous, and potassium (NPK) quality and pH level of soil samples qualitatively. The main objective of the study was to develop an integrated sensor prototype determining the NPK and pH which has a local database generating a geographical coordinate transmitted to a develop MISSA Portal. Soil samples were collected from selected farms in Tubigan, Initao,

Misamis Oriental and analyzed qualitatively using the developed MISSA soil sensing prototype. Obtained results were comparable to the DA standard for soil tests.

Keywords: *soil sensing, smart agriculture, management information system, data collection, NPK quality, soil pH, soil test, Philippines, Engineering*

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0330

Mechanical Property of Ultrafine Elongated Grain Structure Steel Processed by Warm Tempforming and Its Application to Ultra-High-Strength Bolt

Kimura, Yuuji, Inoue, Tadanobu

Our strategy is to enhance the fracture property of ultra-high-strength low-alloy steels with a yield strength of 1.4 GPa or over by arresting the propagation of brittle cracks in hierarchical, anisotropic, and ultrafine-grained structures. This provides a fail-safe design in addition to suppressing crack initiation. The present article reviews the strength, ductility, toughness, and delayed fracture resistance of ultra-high-strength low-alloy steels with ultrafine elongated grain structures processed by the deformation of tempered martensitic structures at elevated temperatures (referred to as *warm tempforming*). The evolution of heterogeneous microstructures during warm tempforming using multi-pass caliber rolling is discussed, as are the microstructural factors controlling the strength and fracture properties of warm tempformed steels. Furthermore, we apply warm tempformed steels with ultrafine elongated grain structures to the fabrication of ultra-high-strength bolts. **(Author's abstract)**

Keywords: *Thermomechanical treatment, Martensitic steel, Strength, Ductility, Toughness, Delayed fracture, Ultrafine grained microstructure, Bolt, Engineering*

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0331

Microstructure and Mechanical Properties of a Hot-rolled High Manganese TWIP Steel Containing 0.3%V

Sun, Xinjun, Wang, Xiaojiang

In this paper, the microstructure, precipitates and mechanical properties of a 0.3%V-alloying high Mn austenitic TWIP steel after hot rolling and aging treatment were investigated, aimed to improve the yield strength of high Mn austenitic steel. Experimental results showed that an elongated and unrecrystallized grain structure could be obtained at a finish rolling temperature of 850°C or below in 0.3V steel. The amount of VC precipitates was very small and most vanadium remained in solution after hot rolling. Therefore, the solute drag effect of dissolved vanadium rather than the Zener pinning effect of VC precipitates was mainly responsible for the inhibition of recrystallization. The yield strength increase of 0.3V steel with decreasing finish rolling temperature was much more remarkable than that of V-free steel. Quantifying possible strengthening mechanisms revealed that most of the YS increase was due to the dislocation strengthening in 0.3V steel. The aging treatment for 30 min promoted the precipitation of VC, but the precipitation amount was still much less than the equilibrium precipitation amount. The comparative analysis on precipitation kinetics of VC in high Mn and low Mn steels indicated that the former

had a more sluggish precipitation rate than the latter. This result was further analyzed in terms of the effect of Mn on the solubility product of VC in austenite. **(Author's abstract)**

Keywords: TWIP steel, Vanadium microalloying, Precipitation, Recrystallization, Aging treatment, Engineering

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0332

Modelling student dropout using AdaBoost and survival analysis

, , Sagun, Mikayla Al

The average graduation rate of UPD COE freshmen admitted between 2009 and 2013 is 66.89%. The UPD COE graduation rate is quite low compared to other schools, indicating that it is important to investigate the dropout rates of students as well. Existing studies made use of several different models in order to predict student dropout. These studies made use of both pre-enrollment data and data on student performance per semester. Out of the different models used, the AdaBoost model and the Cox models consistently performed well. For this study, the AdaBoost model and time-varying Cox model were used to predict whether a student drops out, predict when a student will dropout, and analyze the features that lead to student dropout. Hazard ratios from the Cox model allow us to know whether the features increase or decrease risk of dropout. Pre-enrollment data and post-enrollment data was used to analyze student dropout. Higher number of semesters of absence without leave increase the risk while high school GWA and getting accepted in the student's first or second choice degree program decrease the risk of dropout. These features were found to be significant factors that affect dropout risk for both 4-Year and 5-Year programs. Of the two models, the AdaBoost model performed better at predicting student dropout and drop time. The results of the models can be used to help identify at-risk students as early as possible and guide them with regards to their specific needs.

Keywords: AdaBoost, machine learning, student out, student retention, survival analysis, Cox model, student assessment, Engineering

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0333

Molecular Dynamics Study of the Effect of Carbon Atoms on the Surface Tension of Silicon-carbon Alloy

Narumi, Taka , Shibuta, Yasushi , Yoshikawa, Takeshi

We conducted molecular dynamics simulations of Si-C alloy to understand the atomistic behavior of solute C atoms near the melt surface and to estimate the surface tension. The surface tensions of liquid Si and C were first evaluated and compared with experimental values and those for other metals. The composition dependence of the surface tension of Si-C alloy was then evaluated, and compared with estimates obtained using the modified Butler's model. The behavior of C atoms at the surface of liquid Si-C alloys is also discussed. **(Author's abstract)**

Keywords: Molecular dynamics, Surface tension of alloy, Solution growth, Silicon carbide, Engineering

An MSULBP features selection based on GA and majority voting mechanism in facial expression recognition

Sheykhzadeh, Jafa

Because of excellent capability of description of local texture, local binary patterns (LBP) have been applied in many areas. Also, to extract individual features the efficacy of the uniform LBP has been validated. In this study, a proposed new facial expression recognition system based on Multi-Scale Uniform LBP (MSULBP) schema can fully utilize LBP information. In the previous works, the selection of the optimal subset of the extracted features has not been considered. But in the proposed algorithm, the MSULBP features were extracted from the original facial expression images. The best subset from MSULBP features was found by genetic algorithm (GA) and majority voting mechanism (MVM) and was represented as a histogram descriptor. Finally, support vector machines (SVM) classifier was used for facial expression classification. The experimental results on the popular Japanese female facial expression (JAFFE) database illustrate that the presented facial expression recognition method based on MSULBP obtains the best recognition accuracy rate. Additionally, experiments show that the MSULBP features are robust to low-resolution images, which is critical in real-world applications.

Keywords: *facial expression recognition, local binary patterns, multi-scale uniform LBP, genetic algorithm, majority voting mechanism, support vector machines, Japanese female facial expression, Engineering*

Multistage Base-Catalyzed Transesterification of Soybean Oil for Biodiesel Production

Dizon, Lisa Stephanie H. , Demafelis, Rex B. , Bambase, Jr., Manolito E. , Movillon, Jovita L. , Garcia, Aries Fernan M. , Amponin, Michael Serge S. , Gatdula, Kristel M.

The technical viability of soybean biodiesel production was evaluated to meet the Philippines' increasing demand for diesel blending as mandated by The Biofuels Act of 2006. Multistage base-catalyzed transesterification reaction of soybean oil using methanol and sodium hydroxide at ambient temperature was performed to reduce the biodiesel production cost. The effects of varying the first stage reaction time (t_1), second stage reaction time (t_2), and alcohol/catalyst mixture distribution (D) between stages for the two-stage transesterification and the effects of varying the second stage reaction time (t_2), third stage reaction time (t_3), alcohol/catalyst mixture distribution (D) between stages and alcohol-to-oil molar ratios (R) for the three-stage transesterification were investigated using ANOVA at 5% significance level. A maximum of 97.90% FAME purity of crude biodiesel was produced for the two-stage transesterification at $t_1=45$ min, $t_2=15$ min and $D=70-30$. For the three-stage reaction using 1 :5 alcohol to oil molar ratio, a maximum of 98.29% FAME purity of crude biodiesel was obtained at $t_1=15$ min, $t_2=30$, $t_3=30$ min and 60-20-20 distribution ratio of alcohol/catalyst loading while the highest FAME purity of 98.42% was attained at 1 :6 alcohol to oil molar ratio using the same conditions. Therefore, the results of ANOVA suggested that a two-stage process is better for 1 :6 oil-to-alcohol molar ratio while a three-stage strategy is recommended for 1:5 oil-to-alcohol molar ratio. **(Author's abstract)**

Keywords: *Biodiesel, Multistage transesterification, Optimization, Soybean oil, Engineering*

A New Design of Oxygen Sensor for Electromotive Force Measurement and Electrochemical Deoxidation by Using Oxygen Pump

Li, Jiajun , Kobayashi, Yoshinao

Electromotive force measurement (EMF method) has developed for many decades. It provides a universal approach to measure quantities such as oxygen partial pressure and activity coefficient of metals. Here we present a new design of oxygen sensor, aiming to avoid complications and inaccuracies which are caused by the effect of extra metallic lead wires. Hereafter, we focus on the development of a cleaner electrochemical deoxidation technology by using the newly developed apparatus. The EMF experiments demonstrate a favorable agreement with previous literature, and the electrochemical deoxidation experiments show remarkable results of oxygen contents reducing. All of these results pinpoint the feasibility of the newly developed apparatus. Based on these positive results, we discuss a possible application of this study in the steelmaking process, illustrating a high potential of a further and ultimate deoxidation by a cheaper and cleaner approach. **(Author's abstract)**

Keywords: *Electromotive force measurement, Solid electrolyte, Oxygen sensor, Electrochemical deoxidation, Steelmaking process, Engineering*

Nonlinear Vibration Characteristic Analysis of Roller-Plate System Based on Asymptotic Methods

Wang, Liping , Zhao, Yulai , Zhu, Qingyu , Liu, Yang , Han, Qingkai

A roller-plate system is taken as the research object in this paper. The influence of rolled products of metal plates (thick or middle thick plate) as an excitation parameter on the vibration characteristics of the system during warm rolling process is mainly studied. In view of the hysteresis characteristics between rolling force and deformation of rolled products of metal plates in actual process, Duffing equation is innovatively introduced into the dynamic model and used to generate nonlinear force. The analytical solution of the dynamic model of the roller-plate system is obtained by asymptotic methods, and the correctness of the analytical solution is verified by Runge-Kutta method. Finally, the influence of nonlinear stiffness and nonlinear damping on vibration characteristics of rollers is analyzed, which provides an important theoretical basis for the study of nonlinear vibration characteristics and vibration suppression of roller-plate system during warm rolling. **(Author's abstract)**

Keywords: *Warm rolling, Rolled products, Duffing equation, Asymptotic methods, Hysteretic characteristics, Engineering*

A Novel On-Line Model for the Prediction of Strip Profile in Cold Rolling

Nam, Seung Yeon , Zamanian, Ahmad , Shin, Tae Jin , Hwang, Sang Moo

This paper presents a new on-line model for the prediction of the roll force profile across the strip in cold rolling. Also presented is a new on-line model for the prediction of roll deformed profile in a six-high mill. It is shown that an integrated model may be formed for the prediction of the strip profile on the basis of them. The prediction accuracy of the proposed models is examined through comparison with the predictions from Finite Element simulation. **(Author's abstract)**

Keywords: *Finite element method, Cold rolling, Roll force profile, Strip profile, Roll deformed profile, Engineering*

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Numerical Simulation for the Influence of EMS Position on Fluid Flow and Inclusion Removal in a Slab Continuous Casting Mold

Li, Bin , Lu, Haibiao , Zhong, Yunbo , Ren, Zhongming , Lei, Zuosheng

Electromagnetic stirring (EMS) has been used to improve the steel quality in continuous casting process and EMS position is a key factor in optimizing the stirring performance. In order to clarify the issue that where to install the electromagnetic stirrer, a mathematical model, coupling electromagnetic field and fluid flow field, was developed in this paper. Three cases differing in EMS position have been investigated: the stirrer was installed above the submerged entry nozzle (SEN) port; the stirrer was installed near it; and the stirrer was installed below it. The model was validated by the comparison of electromagnetic flux density. The influence of EMS position on electromagnetic force, flow field and inclusion removal was analyzed. Index R_c was introduced to quantify the possibility of slag entrapment. The results shows that as the stirrer moves downwards, the maximum electromagnetic force increases, index R_c increases first and then turns to decrease, and the electromagnetic force causes the jet to bend more horizontally, resulting in an inactive zone when the stirrer is installed near the SEN port. Furthermore, under our computed condition, to improve the inclusion removal, the stirrer is suggested to be installed below the SEN port. **(Author's abstract)**

Keywords: *Continuous casting, Electromagnetic stirring (EMS), EMS position, Fluid flow, Inclusion removal, Engineering*

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Numerical Simulation of Impinging Gas Jet on a Liquid Bath Using SPH Method

Maruyama, Jumpei , Ito, Kazuki , Ando, Makoto , Okada, Jun , Ito, Kimihisa

As the basis of injection metallurgy, an impinging gas jet on a liquid bath surface was simulated and experimentally verified. The SPH simulation of the gas-liquid two phase flow was developed by using the XSPH method, and the calculation speed was considerably increased with the use of general-purpose computing on graphics processing units. For N₂ gas – water bath system, the simulated shapes and penetration length of the cavity were in good agreement with the experimental results, and the three modes of cavity were reproduced by the calculation. N₂ gas–molten iron bath system was also simulated. The cavity mode was “dimpling mode” for all calculations. **(Author's abstract)**

Keywords: *Gas jet, Cavity depth, Numerical simulation, SPH method, XSPH, Two phase flow, Engineering*

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0341

Optimization of the Mixing Time Using Asymmetrical Arrays in Both Gas Flow and Injection Positions in a Dual-plug Ladle

de Jesus Villela-Aguilar, Jose , Ramos-Banderas, Jose Angel , Hernandez-Bocanegra, Constantin Alberto , Uriostegui-Hernandez, Antonio , Solorio-Diaz, Gildardo

In this work, the multiphase mathematical simulation (steel-argon-slag-air) was used to improve the mixing time in a secondary refining ladle, which is validated with a physical scale model using dye tracer dispersion and measurement of mixing time. An experimental 3k-p design was performed to optimize the number of cases and analyze the effect of injection gas flow arrangement. A mathematical methodology was described to determine the mixing time in a ladle with a multi-sensor system. By means of an analysis of variance, it was found that the angle of separation between plugs is the most relevant variable to reduce mixing time. It was determined that, by using a good asymmetric configuration in both gas flow and location of the porous plugs, it is possible to reduce the mixing time in a secondary steel refining ladle. **(Author's abstract)**

Keywords: *Mixing time, Ladle furnace, Numerical model, Physical modeling, Engineering*

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0342

Parametric Analysis of Pyrolysis Conditions for Yield and Physico-Chemical Characteristics of Biochar from Waste Cacao Pod Husk

Requero, Mariane Concepcion J. , Maguyon-Debras, Monet Concepcion , Capunitan, Jewel A. , Alfafara, Catalino G.

The effects of pyrolysis conditions on the yield and physico-chemical characteristics of the biochar produced from waste cacao pod husk (CPH) was observed using a laboratory-scale batch pyrolysis reactor. Pyrolysis parameters such as temperature (300 and 600°C) holding time (30 and 120 min), and particle size (0.125 and 2.0 mm) were varied following a 2³ factorial design. Statistical analysis using ANOVA at $\alpha = 0.05$ revealed that all three factors

are significant in predicting the yield of biochar. Both temperature (A) and holding time (B) has negative effect on the yield of biochar while particle size (C) has positive effect. Interactive effects such as temperature - holding time (AB), holding time - particle size (BC), as well as the three-way interaction of all the parameters (ABC) were also found to significantly contribute to biochar yield. The effect on the physico-chemical characteristics of these parameters was also observed by conducting proximate analysis and higher heating value (HHV) determination on the CPH feedstock and the biochar. The HHV of CPH feedstock and the biochar was used to determine the energy recovery of CPH biochar and it was found that the highest mass (59.60%) and energy (63.00 %) yield was obtained at 300°C, 30 min holding time and 2.0 mm particle size. The biochar produced was also evaluated using the Van Krevelen diagram for its possible fuel application. Results show that the CPH biochar produced falls in the region of coal solid fuel. **(Author's abstract)**

Keywords: Biochar, Pyrolysis, Waste cacao pod husk, Engineering

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0343

Parametric and Optimization Studies on the Solvent Extraction of Petroleum Nuts (*Pittosporum resiniferum*) Oil

Borines, Myra G. , Migo-Sumagang, Ma. Victoria P. , Movillon, Jovita L. , Maguyon-Oetras, Monet Concepcion , Bambase, Jr., Manolito E. , Guerrero, Gino Apollo M. , Guting, Rose Angeli L.

These studies focused on the extraction of oil from petroleum nuts (*Pittosporum resiniferum*) using polar and non-polar solvents such as ethanol, isopropanol, hexane, and cyclohexane. The dried petroleum nuts contain 55.88% moisture, 21.03% carbohydrate, 9.24% crude fiber, 7.86% crude fat, 4.22% ash, and 1.77% crude protein by weight. The effects of solvent-to-nut ratio, extraction time and temperature on oil yield and recovery were determined using different solvents. Among the three factors considered, solvent to nut ratio gave significant effect on yield and oil recovery for all the solvents used in the study. The highest oil yield and oil recovery were observed for all types of solvent used at 50°C, 3.5 solvent to nut ratio and 12 hr. The highest amount of oil was obtained using ethanol as solvent with an oil yield of 15.38 to.18% (wt/wt) while the lowest oil yield was obtained using hexane with yield of 11.67 to.84% (wtJwt). The highest oil yield was obtained using ethanol due to its hydroxyl group allowing it to attract polar and ionic molecules while its ethyl group is non-polar so it also attracts non-polar molecules. An optimization study on oil extraction using ethanol as solvent was conducted since it gave the highest oil yield. Optimum conditions for the extraction of oil from petroleum nuts were found to be at 47.81°C, 2:1 (vol/wt ethanol to nut ratio), and 8 hr extraction time for a maximum oil yield of 11.6272 % and minimum operating costs. The predicted values obtained from the optimization study were validated experimentally and found to have no significant difference with the predicted values. Therefore the generated equation can be used to predict oil yield with high certainty. Results also showed that the oil contains C6, C10, C12, C14, C16, and C18 as well as terpinenes, monoterpene, monoterpene alcohol and sesquiterpenes which may indicate the potential of petroleum nuts as source of both fuel and high value products. The solvent extraction method gave an oil yield of almost two times compared with the traditional cold pressing and hydro-steam distillation. **(Author's abstract)**

Keywords: Oil extraction, Petroleum nuts, *Pittosporum resiniferum*, Solvent extraction, Engineering

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Passivation Mechanism of Galvanized Steel Rebar in Fresh Concrete

Maeda, Mari , Li, Xiuyang , Ooi, Azusa , Tada, Eiji , Nishikata, Atsushi

We studied the passivation behavior of hot-dip galvanized steel (HDG) rebar and ordinary steel (black) rebar in fresh concrete using electrochemical techniques. Although the passivation behavior was considerably different, both types of rebar were fully passivated. The black rebar was immediately passivated after exposure to fresh concrete; however, the HDG rebar was passivated after being kept active for tens of hours. The corrosion rates of both types of rebars after passivation seemed comparable. To further investigate the difference, we monitored the passivation processes by electrochemical impedance spectroscopy using carbon steel and zinc electrodes in fresh mortar and saturated $\text{Ca}(\text{OH})_2$ solution, which simulated the water in the concrete pores; furthermore, we observed similar trends for fresh concrete. Initially, the Zn surface was partially covered with calcium hydroxy zincate (CHZ) whose coverage increased with exposure time. Finally, the surface was fully covered with a CHZ film after passivation. **(Author's abstract)**

Keywords: *Galvanized steel rebar, Zinc, Passivation, Concrete, Calcium hydroxy zincate, Electrochemical impedance spectroscopy, Engineering*

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Relationship between Thermal Conductivity and Structure of the $\text{CaO-BO}_{1.5}\text{-AlO}_{1.5}$ System

Shirayama, Sakae , Aoki, Hodaka , Yanaba, Yutaka , Kim, Youngjae , Morita, Kazuki

During the continuous casting process in steel making, the mold flux plays an important role in establishing adequate heat flow. Therefore, it is important to optimize the thermal conductivity of the flux system to control this process. Boron oxide (B_2O_3) is one of the components of the mold flux system and its structural complexity is well known. With the aim of revealing the relationship between the thermal conductivity and flux structure, the authors previously studied $\text{BO}_{1.5}$ -containing mold flux systems. In this study, the thermal conductivity of the $\text{CaO-BO}_{1.5}\text{-AlO}_{1.5}$ flux system was measured above 1 500 K for various compositions using the transient hot-wire method. The composition dependence of the flux thermal conductivity was investigated in terms of its local structure, as analyzed using Raman spectrometry and MAS-NMR. The non-additive change in the thermal conductivity of the $\text{CaO-BO}_{1.5}\text{-AlO}_{1.5}$ system, which is known as the borate anomaly, is attributed to the relative fraction of the $\text{BO}_{1.5}$ structural unit or the three-dimensional (3D) structural network involving the $^{[4]}\text{A-O-}^{[3]}\text{B}$ bond. The results obtained by Raman spectrometry revealed that the complexation of the flux structure by the 3D AlB_3O_7 structure can increase the thermal conductivity at a high $\text{BO}_{1.5}$ content. The formation probability for this structure was calculated based on the MAS-NMR results. Thus, the increase in thermal conductivity can be adequately explained by the formation of the AlB_3O_7 structure. For practical purposes, the effect of substituting SiO_2 for $\text{AlO}_{1.5}$ on thermal conductivity was also investigated with fixed $\text{BO}_{1.5}$ and CaO concentrations. **(Author's abstract)**

Keywords: *Thermal conductivity, Glass structure, Mold flux, Alumino-borate, Raman spectrometry, MAS-NMR, Engineering*

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Removal of Fine SiO₂ Composite Inclusions from 304 Stainless Steel Using Super-gravity

Guo, Lei , Gao, Jintao , Li, Chong , Guo, Zhancheng

The super-gravity technique was used to remove the SiO₂ composite inclusions from 304 stainless steel. The effects of different super-gravity coefficients and super-gravity treatment time on the removal effect of inclusions were studied. It was found that the SiO₂-based composite inclusions floated up to the top of the sample after the super-gravity treatment, and the inclusions in the lower part of the sample were largely removed. The volume fraction and number density of inclusions presented a gradient distribution along the direction of the super-gravity, which became steeper with increasing gravity coefficient and treatment time. The total oxygen content at the bottom of the sample was reduced from 150 ppm to 93 ppm within 15 min of super-gravity treatment under the gravity coefficient of $G = 80$. **(Author's abstract)**

Keywords: *Super-gravity, Hige, Inclusion, 304, Stainless steel, Engineering*

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Scheduling Model for the Practical Steelmaking-continuous Casting Production and Heuristic Algorithm Based on the Optimization of “Furnace-caster Matching” Mode

Yang, Jian-ping , Wang, Bai-lin , Liu, Qian , Guan, Min , Li, Tie-ke , Gao, Shan , Guo, Wei-da , Liu, Qing

Considering the “furnace-caster matching” modes, this paper focuses on the scheduling problems from practical steelmaking-continuous casting production lacking refining span. Aiming at the improvement on quality and output of steel products, a mathematical model is established with multi-objective optimization including the minimum earliness/tardiness of starting cast times, the shortest waiting times of heats among different processes and the shortest idle times of converters. A heuristic algorithm based on the optimization of “furnace-caster matching” mode is developed to solve this model, which involves two procedures of device assignment and conflict elimination. Through the detailed analysis on workshop layout and production rhythm, four classes of matching modes of “refining furnace-caster” are proposed to perform the assignments of refining furnaces. The assignments of converters rely on three categories of greedy strategies in terms of minimizing conflicts among heats. A rough scheduling solution with some possible conflicts among heats is obtained through combining “furnace-caster matching” modes and greedy strategies. Then applying the linear programming method to eliminate the conflicts and generate the final solution. Based on the proposed algorithm and the improved genetic algorithms, simulation experiments are carried out by introducing actual production plans as instances. The results indicate that heuristic algorithm based on the optimization of “furnace-caster matching” mode is the right candidate owing to its acceptable scheduling solutions with the better process matching relations and the highlighted performances under crane constraint. Currently, the proposed model and algorithm have been successfully used in a large converter steel plant in China. **(Author's abstract)**

Keywords: *Steelmaking-continuous casting, Workshop layout, Scheduling model, Heuristic algorithm, Furnace-caster matching, Engineering*

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2020,
(Filipiniana Analytics)

Selection of Atomic Emission Lines on the Mutual Identification of Austenitic Stainless Steels with a Combination of Laser-induced Breakdown Spectroscopy (LIBS) and Partial-least-square Regression (PLSR)
Kashiwakura, Shunsuke , Wagatsuma, Kazuaki

Laser-induced breakdown spectroscopy (LIBS) is a promising method for the rapid determination of compositions of stainless steels in steel scrap. LIBS is widely known as a method for very rapid elemental analysis in open-air without any pretreatment. We applied a laboratory-build LIBS system for mutual identification of 5 types of austenitic stainless steels, SUS304, SUS310, SUS316, SUS321, and SUS347. The certified reference materials of JSM M 200 were employed for establishing supervised models, conducting partial-least-square regression (PLSR) for the determination of Cr, Ni, Mo, Ti, and Nb. Since it needed more than 10 minutes of calculation time when all the wavelength range were utilized for PLS2 regression, suitable emission lines in the determination were picked up for the reduction of calculation amount and time. When we select single emission lines having higher excitation levels to avoid an affection by self-absorption, the good determination results for Cr, Ni, Mo, and Nb could be obtained with reasonable accuracy and precision by the calculation with PLS1 regression. **(Author's abstract)**

Keywords: *LIBS, PLS regression, Stainless steel, Engineering*

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Short-term forecasting model for solar PV power output using LS-SVM
Gallano, Russe

The use of renewable energy resources is becoming more prevalent nowadays, especially in distribution systems and microgrids. However, the variability of renewable energy output poses a challenge on the stability and resilience of the power system, particularly in balancing the supply with the load. An output forecast model is useful in this balancing, esp. in scheduling the supply power.

Solar photovoltaic (PV) systems, commonly used as a distributed generator (DG), has a variable output that depends on external factors, such as temperature, irradiance, cloud cover, and so on. The lack of data about these external factors may hinder the accurate modelling and forecasting of solar PV output. This study attempts to develop a short-term forecast model of the output power of solar PV DGs using only historical solar PV output data. Least-Squares Support Vector Machine (LS-SVM) is used to establish the forecasting model and shows promising accuracy, even when used to forecast fluctuations in solar output.

Keywords: *forecasting model, LS-SVM, short-term forecast, solar power model, solar PV, renewable energy, Engineering*

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2021,
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Simulation of Snaking and Buckling in Hot Sheet Rolling

Komori, Kazutake

In hot sheet rolling, the sheet rear end often snakes, contacts the inlet side guide, buckles, and goes into the roll gap, whereas the overlapped rear end of the sheet is squeezed. Although a number of researches on the simulation of the sheet snaking are reported, no researches have been performed to simulate both the sheet snaking and the sheet buckling. In this study, a combined method to simulate the sheet snaking by the rigid-plastic FEM and to analyze the sheet buckling by the elementary theory of buckling was proposed. First, the method in which the in-plane lateral load and the in-plane bending moment were assumed at the surface of the simulation region by the rigid-plastic FEM was proposed. Next, the amount of snaking at the sheet rear end simulated by the rigid-plastic FEM agreed with that analyzed by the elementary theory of rolling. Finally, the effects of rolling conditions on the occurrence of squeezing, such as the difference in the sheet thickness in the direction of the roll axis, the difference in the roll gap in the direction of the roll axis, and the amount of the sheet off-center, were clarified. **(Author's abstract)**

Keywords: *Sheet snaking, Sheet buckling, Simulation, Hot sheet rolling, Engineering*

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Simultaneous Broadening Analysis of Multiple Bragg Edges Observed by Wavelength-resolved Neutron Transmission Imaging of Deformed Low-carbon Ferritic Steel

Sato, Hirotaka , Iwase, Kenji , Kamiyama, Takashi , Kiyonagi, Yoshiaki

With the goal of real-space mapping of dislocation information using a wavelength-resolved (spectroscopic) neutron transmission imaging method, broadenings of multiple Bragg-edges in neutron transmission spectrum were investigated in detail for the first time. Data of time-of-flight (TOF) neutron transmission imaging and diffraction experiments on a polycrystalline low-carbon ferritic steel sample while undergoing tensile testing were analysed. The Bragg-edge neutron transmission spectroscopy was combined with the classical Williamson-Hall method corrected by the crystal elastic anisotropy using the ratio of diffraction Young's modulus, namely, the corrected classical Williamson-Hall (ccWH) method. As a result, the broadening values evaluated from the ccWH analysis of Bragg-edge data were consistent with results of both our TOF neutron diffraction experiments and previous reports. In addition, it was deduced that the line-broadenings appearing in the plastic deformation condition during tensile testing in our experiment were mainly caused by micro-strain (dislocation density) effect and not by crystallite size effect. Finally, a Bragg-edge broadening mapping method, using a simultaneous multiple Bragg-edges profile analysis based on the ccWH method, could identify plastically deformed zones in the sample more clearly than a traditional single Bragg-edge broadening analysis method. **(Author's abstract)**

Keywords: *Pulsed neutron transmission imaging, Multiple Bragg-edges broadening analysis, Corrected classical Williamson-Hall method, Micro-strain, Dislocation density, Crystallite size, Engineering*

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Smart adaptor: a wireless power switch of home appliances for risk reduction

Contreras, Harvvey Leona

As the technology invades our homes, the chance of electrical fires happening increased over recent years. The study, Smart Adaptor is the solution suited in preventing those fires with simple home automation using smart adaptor system which transforms traditional appliances at home into a smart one. It was focused on creating a device to be added to the home appliances that is efficient, reliable and accurate and helped on lessening fire breakouts due to electronic malfunction. The device was tested in two households in Brgy. 150 Tondo, Manila wherein the device was used in two weeks span. The three main components were examined wherein the PIR sensors ability to detect human presence, the smart adaptors capability of turning off appliances and the Main servers monitoring skill were tested. The efficiency was based on the power consumption in two households wherein a decrease of 20-28% in the total power consumption with Smart Adaptor was measured. The average response time of 0.95 seconds proved the reliability of the PIR sensor to detect human presence within the range of 105o within 5.4 meters distance and 2.74 meters width. The connectivity of the PIR and main server had an accuracy of 90% while that of the smart adaptor to the main server was 85%. Hence, the three main components in a system were acceptable to the respondents with 4.35 overall rating. Thus, the system was capable of monitoring home appliances and reduces fire breakouts at the same time.

Keywords: *PIR sensor, smart adoptor, main server, alarm system, Engineering*

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2019,
(Filipiniana Analytics)

Structural Evolution of Molten Slag during the Early Stage of Basic Oxygen Steelmaking

Zhang, Rui , Min, Yi , Wang, Yu , Zhao, Xuan , Liu, Chengjun

The better understanding of structural effect of composition is of primary importance in the design of converter slag and for rationalizing the foaming performance of smelting process. In the present work, the CaO–SiO₂–Fe_xO samples with different compositions were prepared to simulate the converter slag of initial smelting stage. The compositions and structural units of slag samples were investigated by combining X-ray fluorescence spectroscopy and Raman spectroscopy. According to the results, the transformation behaviors of structural units and the degree of polymerization (DOP) of molten slag were further analyzed. The results of Raman spectra showed that when basicity increased from 0.38 to 0.97 and total iron content decreased from 32.77 to 13.26 mass%, increasing O²⁻ led to the depolymerization of [SiO₄]⁴⁻ tetrahedrons from Q³ to Q⁰ units and the increasing [FeO₄]⁵⁻/[FeO₆]⁹⁻ ratio. With further increasing basicity from 0.97 to 1.25, Q³ units disappeared and more O²⁻ reacted with [FeO₄]⁵⁻ tetrahedrons to form [FeO₆]⁹⁻ octahedrons. Meanwhile, Fe³⁺ could probably form Si–O–Fe bond by replacing Si⁴⁺ cations in Q³ units. Overall, the depolymerization of [SiO₄]⁴⁻ tetrahedrons from Q³ to Q⁰ units was the main reason for the decreasing DOP of molten slag during the early stage of basic oxygen steelmaking. **(Author's abstract)**

Keywords: *Basic oxygen steelmaking, Molten slag, Melt structure, Evolution, Engineering*

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2020,

Structural Transformation of Molten CaO–SiO₂–Al₂O₃–Fe_xO Slags during Secondary Refining of Steels

Wang, Yu , Zhang, Rui , Zhao, Xuan , Min, Yi , Liu, Chengjun

According to the variation of compositions during steel secondary refining process, the ice-quenched samples of CaO–SiO₂–Fe_xO–Al₂O₃ system were prepared, the structure were detected via the method of Raman spectroscopy, and the evolution of structural units were further analyzed. The results showed that, for the Fe³⁺ cation, two types of units of tetrahedral fourfold coordination ([FeO₄]) and octahedral sixfold coordination ([FeO₆]) coexisted in the molten slag, and the ratio of [FeO₆]/[FeO₄] increases with the decreasing ratio of CaO/(SiO₂+Al₂O₃). For the Al³⁺ cations, four types of aluminum units of Q²_{Al}, Q³_{Al}, Q⁴_{Al} coexisted in the molten slag and the lower polymerized units Q²_{Al} transform into the higher polymerized Q³_{Al} and Q⁴_{Al} along with the ratio of Al/(Al+Si) increasing from 0.41 to 0.85. For the Si⁴⁺ cations, Q⁰_{Si}, Q¹_{Si} and Q²_{Si} are the main types of [SiO₄]-tetrahedral units, the Ca²⁺ cations of oxygen coordination in [SiO₄]-tetrahedral units are gradually replaced by Al³⁺, which just act as network modifier, with the increase of Al/(Si+Al) ratio. Accordingly, the degree of polymerization of molten slag presented in NBO/T increases with the process of secondary steelmaking. **(Author's abstract)**

Keywords: *Secondary steelmaking, Refining slag, Melt structure, Raman spectroscopy, Engineering*

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Supergravity-Induced Separation of Oxide and Nitride Inclusions from Inconel 718 Superalloy Melt

Shi, Anjun , Wang, Zhe , Shi, Chengbin , Guo, Lei , Guo, Changqing , Guo, Zhancheng

Herein, a method of supergravity-enhanced separation was used to remove oxide and nitride inclusions from Inconel 718 superalloy melt, with elucidating the inclusion removal behavior by varying the gravity coefficients (G) and separation times (t) used for melt treatment. Under supergravity conditions, inclusions concentrated at the sample top and are almost absent at the sample bottom. Moreover, the inclusion number density and average size showed a gradient distribution along the supergravity direction, and the steepness of this gradient rapidly increased with increasing G and t. The experimentally determined inclusion movement velocities agreed well with those calculated using Stokes's law at $G \leq 210$ and $t \leq 10$ min. At $G = 210$ and $t = 10$ min, the total oxygen and nitrogen contents of the sample decreased from 34.4 to 8.7 ppm and 133.4 to 34.1 ppm, respectively, corresponding to oxide and nitride removal efficiencies of 74.7% and 74.4%, respectively. **(Author's abstract)**

Keywords: *Supergravity, Oxide inclusion, Nitride inclusion, Separation, Superalloy, Engineering*

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Taguchi Orthogonal Test on Granule Properties and Porosity Distribution in Sintering Bed using High-resolution X-ray Computed Tomography

Xu, Jianuo , Zhou, Hao , Zhou, Mingxi , Hu, Shihao , Zuo, Yuhang

Granulation and packing of iron ores are highly essential for having a strong function with packed bed porosity distribution, and further affecting the subsequent sintering process. In this study, high-resolution X-ray computed tomography technique was applied to investigate the influence of moisture, hydrated lime and concentrate levels on granule properties and porosity distribution of packed bed based on the Taguchi orthogonal array tests, and the optimum granulation factors combination was determined by the defined porosity segregation degree for improving packed bed homogeneity. Moisture was found to be the dominant factor affecting granule size with a major percent contribution of 94.42%. Bulk bed porosity was significantly affected by all three selected factors of moisture, hydrated lime and concentrate levels. The percent contribution order was shown as hydrated lime (55.10%)> moisture (29.12%)> concentrate (14.36%). The whole packed bed was found to exhibit significant inhomogeneity. Axial porosity increases from the bottom upwards along the packed bed height, and radial porosity appears a symmetric parabolic distribution where porosity achieves the minimum of 0.3 at bed center and increases sharply near the wall. To achieve the homogeneous packed bed of iron ore granules, the optimum granulation factors combination for decreasing axial and radial porosity segregation are determined as 6.8% moisture, 4% hydrated lime, 0% concentrate and 5.8% moisture, 4% hydrated lime, 0% concentrate, respectively. The results provide the theoretical guidance for granulation and packing in iron ore sintering to improve sintering yield and quality. **(Author's abstract)**

Keywords: *Iron ore sintering, Granule properties, Bed porosity distribution, X-ray computed tomography, Taguchi orthogonal test, Engineering*

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Tailor Welded Partition Blanks: New Methods Improve the Ductility of Ultra-high-strength Welded Joint

Xing, Fei , Qiu, Xiaoming , Lu, Yuzhen , Luo, Cui , Wang, Dengfeng

A novel quenching and partitioning (Q&P) processing was applied to the ultra-high-strength tailor welded blanks (TWBs) with an equiaxed martensite, retained austenite and carbides in the weld. The Q&P processing consisted of a cooling step and a partition step at 450°C for 10 s to 30 s. The fraction of martensite after the processing was nearly 64%. During partitioning, carbides precipitates with an average size of 30 nm formed inside the martensite. Currently, the interstitial content of austenite was increased to an average of almost 1.2 wt.%. After Q&P processing, the TWB of partition joints exhibited outstanding mechanical properties including a yield strength of 450 MPa, a tensile elongation of 15% at room temperature, and a formability ratio of 108.72% and 81.66%, with respect to the BMs DP1180 and DP590. Furthermore, the tempered martensite formation and austenite ductile-effect were attributed to the formability improvement of ultra-strength-steel TWBs. **(Author's abstract)**

Keywords: *TWBs, QP processing, Ultra-high-strength steel, Formability, Engineering*

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Tension Leveling Using Finite Element Analysis with Different Constitutive Relations

Wang, Honghao , Wu, Boxun , Higuchi, Takuya , Yanagimoto, Jun

In hot sheet rolling, the sheet rear end often snakes, contacts the inlet side guide, buckles, and goes into the roll gap, whereas the overlapped rear end of the sheet is squeezed. Although a number of researches on the simulation of the sheet snaking are reported, no researches have been performed to simulate both the sheet snaking and the sheet buckling. In this study, a combined method to simulate the sheet snaking by the rigid-plastic FEM and to analyze the sheet buckling by the elementary theory of buckling was proposed. First, the method in which the in-plane lateral load and the in-plane bending moment were assumed at the surface of the simulation region by the rigid-plastic FEM was proposed. Next, the amount of snaking at the sheet rear end simulated by the rigid-plastic FEM agreed with that analyzed by the elementary theory of rolling. Finally, the effects of rolling conditions on the occurrence of squeezing, such as the difference in the sheet thickness in the direction of the roll axis, the difference in the roll gap in the direction of the roll axis, and the amount of the sheet off-center, were clarified. (Author's abstract)

Keywords: *Sheet snaking, Sheet buckling, Simulation, Hot sheet rolling, Engineering*

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Thermal Decarboxylation of Coconut Oil using Different Catalysts

Capunitan, Jewel A. , Bambase, Jr., Manolito E. , Borines, Myra G. , Demafelis, Rex B. , Movillon, Jovita L. , Abarquez, Nathalie Claire R. , Condecion, Gino L. , Garcia, Ahmad A. , Paz, Gillianne Alyana O.

Thermal decarboxylation, one of the various pathways by which hydrocarbons can be produced from biomass, was applied to coconut oil, an abundant and readily available feedstock in the country. Various catalysts, namely, magnesium oxide (MgO), calcium carbonate (CaCO₃), bentonite and calcium oxide (CaO), were tested in this study. Reactions were carried out for three hours to determine the effect of three variables - temperature (150°C and 200°C), solvent (kerosene) concentration (76.9 wt% and 90.9 wt%) and catalyst concentration (0.99 wt% and 23.1 wt%), via 2k factorial design of experiment, on the percent oil conversion. The percentage of triglycerides in the oil that reacted was quantified by determining the change in the amount of triglycerides before and after the reaction by thin layer chromatography (TLC). Results showed that generally, higher levels of each factor resulted in increase in percent oil conversion. Using MgO and CaCO₃ as catalysts gave significantly higher average oil conversion (46.2% and 57.6%, respectively) than when using bentonite and CaO (28.7% and 29.4%, respectively). All the factors as well as the temperature-catalyst and solvent concentration-catalyst concentration interactions significantly affected the percent oil conversion for MgO. For CaCO₃ catalyst, all of the factors considered had a positive significant effect on the percent conversion, except for temperature, which has a pronounced effect only if its interaction with the other factors is considered. Highest oil conversion was observed at the high levels of the factors (200 °C, 90.9 wt% solvent and 23.1 wt% catalyst) for both MgO and CaCO₃ catalysts. The results showed that thermal decarboxylation of coconut oil may be carried out under conditions of ambient pressure and mild temperatures, and using readily-available catalysts such as bentonite, CaO, MgO and CaCO₃. (Author's abstract)

Keywords: *Bentonite, Calcium carbonate, Calcium oxide, Coconut oil, Decarboxylation, Magnesium oxide, Engineering*

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2018 December,
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Thermodynamic performance evaluation of internal heat exchanger in a compressor-driven ejector heat pump system

Garcia, John C

This study provides a theoretical analysis of the effect of an internal heat exchanger (IHX) on an ejector heat pump system. An internal heat exchanger is placed between the intermediate-pressure and high-pressure sides of the system. The performance of the systems with and without IHX is evaluated using the coefficient of performance and exergy efficiency. The results show that the ejector heat pump system with IHX has a higher heating capacity, coefficient of performance, and exergy efficiency. The introduction of IHX also increases the reliability of the compressor by ensuring that only vapor refrigerant enters the component. The performance of five refrigerants, namely R32, R290, R407c, and R410a, are compared. Among the refrigerants observed, R134a has the highest coefficient of performance (7.17), while R32 has the highest exergy efficiency (68.73%). The effects of evaporating and condensing temperatures to the system with IHX are also investigated. It is found out that the evaporating temperature has a significant effect on both the coefficient of performance and exergy efficiency.

Keywords: *ejector, heat pump, COP, exergy analysis, Engineering*

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Time Change in Scale Microstructure of Fe-5 mass%Ni Alloy at 1200°C

Harashima, Aya , Kondo, Yasumitsu , Hayashi, Shigenari

Ni containing steel is known to form a complex oxide scale, which consists of an outer layer of Fe-oxides and an inner layer of FeO with complicated distribution of Ni(Fe) metal particles. Due to the complex microstructure, descaling of the oxide scale formed on Ni containing steel during a hot-rolling process is very difficult. In order to improve the descaling process, microstructural control of the inner oxide layer to eliminate its detrimental effect is necessary.

In this study, the change in microstructure of the outer and inner layers formed on Fe-5 mass%Ni alloy during oxidation is investigated. In particular, the change in the microstructure of the metal particles in the inner layer with oxidation time is considered.

The inner layer consisted of FeO, Ni(Fe), and voids. The concentration of Ni in the Ni(Fe) was found to increase across the inner layer from the scale/steel interface toward the outer/inner scale interface due to the equilibrium Ni concentration in the Ni(Fe) particles with FeO, which corresponded to the oxygen potential gradient in the inner layers. The number and area fraction of the Ni(Fe) metal particles decreased, whereas the size of the particles increased with oxidation time. This coarsening of the metal particles was proposed to be due to Ostwald ripening.

(Author's abstract)

Keywords: *Oxidation, Scale, Inner layer, Nickel, Void, Oxygen potential gradient, Ostwald ripening, Engineering*

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2020,

Tracking the Burden Surface Radial Profile of a Blast Furnace by a B-mode Mechanical Swing Radar System

Tian, Jiuzhou , Tanaka, Akira , Meng, Yue , Hou, Qingwen , Chen, Xianzhong

To continuously track the burden surface radial profile inside a blast furnace in every noncharging period, a new organizing structure for the scanned data of a mechanical swing radar system was proposed. The detection results of the radial shape of the burden surface in one scanning period can be organized into a matrix and represented by a composite image. Then, the extraction of the burden surface radial profile can be achieved by the segmentation of a featured region in the composite image. To address the incorrect segmentation results caused by the deterioration of the image quality in the later stage of each noncharging period, a priori curve-based image segmentation algorithm was proposed. The shape prior was constructed by a priori shape function and a current state function decomposed from the contours of the priori and current segmented regions, respectively. Compared with the classical region-scalable fitting segmentation algorithm, the proposed algorithm has the ability to provide more reasonable segmentation results during the entire noncharging period. The tracking of the burden surface radial profile can be accomplished by calculating the corresponding shape function from the contour of the segmented image region. Compared with the results produced by the existing A-mode radar data processing method, oscillations and local outliers can be avoided in the results of the proposed method. The goal of the continuous tracking of the burden surface radial profile was accomplished. **(Author's abstract)**

Keywords: *Blast furnace, Burden surface shape, Radar, Image segmentation, Level set method, Engineering*

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ENVIRONMENTAL SCIENCE

Biomass and carbon sequestration of forest tree species in response to microbial biofertilizers

, Algabre, Iris Ashley C.,

Climate change is presently the most important issue facing our generation. Estimation of plant biomass is one of the methods used to determine the amount of stored carbon, which can help implement appropriate strategies to reduce environmental degradation and mitigate climate change. This study assessed the carbon sequestration and storage by three reforestation species: *Pterocarpus indicus*, *Acacia mangium*, and *Eucalyptus urophylla*, as influenced by microbial fungi with or without nitrogen fixing bacteria (NFB). *Pterocarpus indicus* were grown in a nursery in Gasan, Marinduque for 5 months, while *A. mangium* and *E. urophylla* were raised at the screen house of BIOTECH UPLB. Inoculation was done during pricking while lime and vermicompost were applied to all seedlings during field planting. Allometric equation developed by Martines-Yrizar *et al.* (1992) was used to determine biomass density using stem diameter and total height of the tree. Representative trees were excavated 27 months after field planting. Results showed that *A. mangium* and *P. indicus* inoculated with mycorrhiza + NFB showed a 128% and 17%, respectively, increase in accumulated biomass and CO₂ content. In *E. urophylla*, 83% biomass increase was observed with mycorrhizal inoculation alone. The results suggest that plant biomass and carbon sequestration due to microbial inoculation vary depending on tree species. *A. mangium* produced higher

plant biomass, that consequently, gave higher amount of stored or sequestered CO₂ than *E. urophylla* and *P. indicus*. Similar studies should be conducted in other mined- out areas in the country to validate the results.

Keywords: *Cardaba banana, debelling, fruit quality, brunch quality, hand trimming, Pterocarpus indicus, Acacia mangium, Eucalyptus urophylla, microbial fertilizer, biomass, Environmental science*

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0364

Design of a low-cost differential optical absorption spectroscopy set-up for simultaneous monitoring of atmospheric NO₂ concentration and aerosol optical thickness

Bacaoco, Migu

Air quality monitoring in urban areas is indispensable in understanding the environment and how anthropogenic factors contribute to the increasing volume of pollutants in the atmosphere. Differential optical absorption spectroscopy (DOAS) is a useful technique in identifying and quantifying trace amounts of air pollutants over a wide region. In this paper, a low-cost DOAS set-up was developed and was used to measure nitrogen dioxide (NO₂) concentration and aerosol optical thickness (AOT) in the University of the Philippines Diliman campus. The temporal variation of NO₂ concentration from the DOAS measurement was found to agree with the relative NO₂ integrated absorbance from 430-450 nm. A calibration curve was then constructed with calculated sensitivity of 4.467 per mg•mm⁻³ (8.540 per ppm). The concentration range of the low-cost set-up is also able to detect unhealthy NO₂ levels in the Philippines. Aerosol optical thickness was then retrieved and showed similar temporal variation with NO₂ throughout the duration of the experiment. The correlation was attributed to the photochemical reaction of NO₂ to NO₃⁻, which then forms into aerosol. Average daily AOT at different wavelengths was then determined and was compared to AERONET's data. The results were in agreement with each other and both displayed decreasing AOT at increasing wavelength, which is an expected behavior for a Mie-scattered light due to aerosol. More importantly, proof-of concept demonstration of low-cost DOAS set-up, capable of measuring trace amounts of NO₂ and AOT, was successfully performed. Results show that the low-cost design can provide an alternative, cheaper and portable atmospheric NO₂ and aerosol measurement technique with reliable sensitivity for environmental monitoring applications.

Keywords: *nitrogen dioxide (NO₂), aerosol, differential optical absorption spectroscopy (DOAS), urban air pollution, Environmental science*

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0365

Effects of Operational Factors on the Performance of Biogas Production of Simple Swine Manure Digester

Sobremisana, Marisa J. , Alcantara, Antonio J. , Zamora, Oscar B. , Saludes, Ronaldo B.

The use of an anaerobic digestion system also known as biogas digester, is becoming a popular producer of alternative source of energy, low cost wastewater treatment approach and greenhouse gas (GHG) emission reduction technology. However, adoption of this technology is limited by the difficulty in controlling the

operational parameters and its sensitivity to varying input variables. In this study, critical operational factors such as pH, temperature, organic loading rate, mixing and hydraulic retention time (HRT) were monitored, and their effects analyzed. Performance indicators such as volatile solids and chemical oxygen demand (COD) reduction and biogas production were measured and analyzed in relation to the operational factors in a simple swine manure digester. Low production of biogas corresponded to low pH of the manure slurry. The COD of anaerobic digester loaded twice daily is higher than a loading interval of once daily under constant organic loading rate. Regardless of the loading interval the digesters were subjected to, the COD after 15 d HRT is still higher compared to the allowable effluent COD of 100 mg L⁻¹ for Class C (for Freshwater) and 60 mg L⁻¹ for Class SB (for Marine Water) water body classification before disposal. Better performance of continuous flow-stirred digesters should maintain an organic loading rate at low-medium total solid (TS) content of (10-20%). **(Author's abstract)**

Keywords: *Anaerobic digestion, Biogas production, Chemical oxygen demand, Swine manure, Environmental science*

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0366

Influence of microbial inoculation on heavy metals absorption of three reforestation species *, Morong, Lea Joy M.*

Pterocarpus indicus, *Acacia mangium* and *Eucalyptus urophylla* are fast growing tree species that thrive in diverse environments and have the potential to rehabilitate heavy metals (HM) contaminated areas i.e. mined-out areas. To determine the effect of microbial inoculation on the absorption and translocation of HMs, three treatments consisting of no microbial inoculants, mycorrhiza and mycorrhiza+NFB were applied to three reforestation species following a 2-factor experiment in RCBD. The bioconcentration factor (BCF) values indicate that *P. indicus*, *A. mangium* and *E. urophylla* accumulated higher HMs in their roots with respect to their corresponding rhizosphere soil, therefore reducing the availability of HMs in the environment. Among the tree species *P. indicus* inoculated with mycorrhiza+NFB seems to be the best bioremediation species and most effective in reducing HM in soil having had the highest BCF for Cd, Pb and Cu. Moreover, even with just mycorrhizal treatment, *P. indicus* was still able to effectively exclude Cu having shown the highest translocation factor (TF) for Cu. All the three reforestation species, however, when inoculated with microbial fertilizers have the potential to remediate Cu, Pb and Cd laden soils and are recommended to be utilized in bioremediation of HM contaminated sites. It is also recommended that inoculants be tested on plants used as food in HM contaminated areas to determine their effects on their HM absorption to address the possibility of HM entry in the food chain.

Keywords: *bioconcentration factor, phytoremediation, translocation factor, Pterocarpus indicus, Acacia mangium, Eucalyptus urophylla, microbial inoculation, reforestation species, Environmental science*

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2019,
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0367

The Species Composition and Associated Fauna of the Mangrove Forest in Tabuk and Cabgan Islets, Palompon, Leyte, Philippines

Marababol, Mario S. , Avila, Stella Therese R. , Tano, Manolita F. , Picardal,

This study assessed the species composition and diversity of the mangrove forest and associated faunal species in Tabuk and Cabgan Islets, Palompon, Leyte. The present survey in Tabuk shows that there are five species of mangroves observed such as *Sonneratia alba*, *Avicennia marina*, *Rhizophora stylosa*, *Rhizophora mucronata* and *Rhizophora apiculata*. In Cabgan, the common species of mangroves were *Sonneratia alba*, *Avicennia marina*, *Rhizophora stylosa* and *Rhizophora apiculata*. In both islets, *A. marina* is the most important mangrove species to the mangrove ecosystem as manifested by its high importance value (115.3 in Tabuk and 147.96 in Cabgan). As a whole, Tabuk is more diverse than Cabgan, as evidenced by its higher Shannon Index value: 0.5778 in Tabuk over the 0.5198 in Cabgan. Mangrove-associated fauna found in both islets were identified down to the genus level only, but were not assessed quantitatively. Fauna in Tabuk include the golden crown flying fox, 4 genera of fishes, 16 mollusks (mostly gastropods), 5 crustaceans, 18 echinoderms, 3 tunicates, a species of sponge, 3 insects, a species of segmented worm and a species of an upside-down jellyfish. On Cabgan, 4 genera of fishes, 16 species of mollusks, 6 species of crustaceans, 16 species of echinoderms, 2 species of tunicates, 4 species of sponges and 3 species of insects were observed. Comparatively, Tabuk is richer in terms of diversity than Cabgan islet. This obvious difference is due to a less disturbed environment of Tabuk having been a bird and marine sanctuary since 1995, than Cabgan, gleaning, fish pens and other human fish-related activities are observed. (Author's abstract)

Keywords: Mangrove species, Tres Marias Islets, Mangrove associated fauna, Biodiversity assessment, Marine conservation, Environmental science

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2011,
(Filipiniana Analytics)
NP

FISHERIES

0368

Assessment of mud crab fishery in Panguil Bay Celestina Q. Jumawan, Ephrime B. Metillo, Juvenry P. Poli

The last assessment of three commercially important mud crab species (*Scylla tranquebarica*, *S. olivacea* and *S. serrata*) in the mangrove dominated Panguil Bay was in 2005; there was already an indication of the stock decline. This study aimed to continue the assessment but focused on production, growth parameters, total mortality, and exploitation rate of the three mud crab species at seven mud crab landing sites from March 2017 to March 2019 following standard fisheries enumeration protocols. Results showed that the total resource production in Panguil Bay decreased from 201.1 MT in 2005 to 103.0 MT in 2017-2019. Growth parameters of the three species for male and female, respectively are as follows: *S. tranquebarica* (L_{∞} = 11.5 cm and 11.7 cm, annual growth coefficient K = 0.6 and 0.6, exploitation rate E of 0.5 and 0.5); *S. olivacea* (L_{∞} = 10.9 cm and 11.4 cm, K = 0.5 and 0.6, E = 0.6 and 0.5); and *S. serrata* (L_{∞} = 12.3 cm and 12.9 cm, K = 0.7 and 0.6, E = 0.6 and 0.6). Total production of mud crabs increased, and the three species are highly exploited, but exploitation rates are already slightly below or above maximum sustainable yield (E_{max}). A total of 1,848 fishers were recorded owning 2,015 boats composed of 1,419 motorized and 596 non-motorized. An inventory showed an increase of 5.36% in the number of motorized boats from the last assessment in 2005. A total of 15 types of gear were recorded, in which the top three include fish corral, crab pot, and gill net. Consequently, this study recommends reducing the present fishing pressure or effort of the three mud crab species, particularly during the spawning season occurring on wet months (July to October), for sustained mud crab fisheries in Panguil Bay.

Keywords: stock assessment, mudcrab, exploitation rate, Panguil Bay, Fisheries

Assessment of processing methods for sandfish (*Holothuria scabra*) in Pangasinan, Palawan, and Davao, Philippines

Adoracion V. Obinque, Vivian T. Nebres, Virginia H. Delos Santos, Rosario J. Ragaza, Charlotte Ann M. Ramos, Ariel Joshua J. Madrid, Ulysses M. Montojo, Rosa A.

The Philippine beche-de-mer is reported to get the lowest prices compared to Indo-Pacific Islands competitors, mainly due to small sizes, inferior end-product quality, and use of low-value species. With this, the traditional methods of processing sandfish (*Holothuria scabra*), a high-value sea cucumber species, were assessed through survey questionnaires (n > 30) and documentation. The identified study sites were coastal areas where sandfish production and processing are abundant, namely: Anda and Bolinao, Pangasinan; Palawan; and Davao and Compostela Valley. Processing sea cucumbers into beche-de-mer involves the primary steps of cleaning, boiling, and smoke or sun-drying. Variations were observed in the order and number of doing each primary step, as well as in the specific manner of cleaning (slitting, gutting, brushing), boiling, and smoke or sun-drying. Quality evaluation of the products from these different processing methods is recommended to theorize how to improve the overall status of Philippine beche-de-mer, as well as the updating of these findings.

Keywords: *sea cucumber, beche-de-mer, trepang, balat/balatan, traditional processing, Fisheries*

Design and implementation of an automated fish feeder robot for the Philippine Aquaculture Industry: feeding mechanism and float design module

Deroy, Maria Cizel U. ,

The researchers developed an automated fish feeder robot's feeding mechanism and floater mechanical assembly to be used in aquaculture farming that aims to aid in the distribution of feeds. Data such as the conveyor's feeding capacity per unit time, the density of pellets dispensed in the cage and per quadrant were calculated and critical load check and stability tests were completed. Visual tests for the prototype were also conducted. The Aslong 12v JGB37-550 direct current (DC) motor was used to drive the bucket conveyor which is responsible for the transport of pellets to be dispensed to the outlet. On the other hand, the 3-blade commercial remote-controlled (RC) boat propeller driven by the Graupner 12V brushed motor was used to propel the floater while navigating and dispensing feeds throughout the fish cage. After assembling and building the whole prototype and combining the feeding system and the floater design, the researchers have tested its effectiveness, stability, and operation. With those parameters tested and calculated, it is concluded that the design of the feeding mechanism and floater is operational and suitable for automation of fish feeding in fish cages.

Keywords: *automated fish feeder robot, feeding mechanism, float design module, Philippines, aquaculture industry, aquaculture farming, Fisheries*

Effects of Collector Sea Urchin (*Tripneustes gratilla*) on the Reduction of Brown Seaweed (*Dictyota* spp. and *Padina* spp.) Cover in Post-Coral Bleached Systems
Dalabajan, Anna Karenina C. , Hilay, Suzielette Veve R. , Velasco, Ma. Cailah Joyce O. , Navarro, Virna Jane M. , Olvido, Angelo P.

The purpose of this research is to determine the effects of *Tripneustes gratilla* in reducing the abundance of *Dictyota dichotoma* and *Padina* spp. in macroalgal-dominated marine ecosystems. Corals attached with macroalgae were exposed to the *Tripneustes gratilla* for two weeks. Measurement of the macroalgal density before and after the exposure of *T. gratilla* was administered. The Fleshy Macroalgal Index of the units with sea urchin and without sea urchin were also compared and analyzed. A software, PhotoQuad, was utilized to quantify the FMI of each unit. The results showed that the presence of *T. gratilla* did not significantly reduce ($p=0.23$) the macroalgal cover in comparison to the control group. Nevertheless, the compared FMI of the pre-exposure and post-exposure to the urchin showed a significant difference ($p=0.023$). In conclusion, the reduction of the macroalgal cover may be attributed to the presence of *Tripneustes gratilla*. Although it is only comparably different, the exposure to *Tripneustes gratilla* can potentially aid in the recovery of macroalgal-covered post coral bleached systems and in the control of invasive macroalgae population. **(Author's abstract)**

Keywords: *Tripneustes gratilla*, *Dictyota* spp., *Padina* spp., Fisheries

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Growth of Abalone *Haliotis asinina* Fed With *Hydropuntia edulis*, Singly or in Combination With Other Red Algae in Sea Cages in Tondol, Anda, Pangasinan, Northern Philippines
Capinpin, Jr., Emmanuel C. , Parreno, Shella C. , Abalos, Rosie S.

An experiment was conducted to determine the effect of using only a single species diet, *Hydropuntia edulis* (= *Gracilaria edulis*) and a diet of mixed algae (*H. edulis*, *Euclima arnoldii*, and *Halymenia durvillaei*), which are all locally abundant in Tondol, Anda, Pangasinan on the growth of abalone *Haliotis asinina*. Small abalone (40.38±0.31 mm shell length and 14.69±0.39 g body weight for Trial 1 and 37.66±0.33 mm SL and 13.37±0.35 g BW for Trial 2) found in the area were collected by fishers and stocked in cages (50 cm X 50 cm X 20 cm). Two trials with two treatments were conducted with five replicates per treatment. Stocking density was 15 abalone per cage. Results of Trial 1 showed that those fed with a single species diet grew from 40.30±0.45 mm to 44.67±0.38 mm in shell length and 14.71±0.57 g to 19.73±0.44 g in weight whereas those fed with mixed algal diet grew from 40.45±0.47 mm to 46.74±0.79 mm in length and 14.67±0.61 g to 23.20±1.08g in total weight after 135 d in culture. There was a significant difference in length and weight after 135 d using the t-test ($P<0.05$). Results for trial 2 were similar in that a significant difference was observed between the two treatments after 120 d using the t-test ($P<0.05$). In trial 2, abalone fed with a single-species diet grew from 37.48±0.56 mm to 43.72±0.35 mm in shell length and from 13.47±0.66 g to 19.00±0.59 g in weight whereas those fed with mixed-algae grew from 37.84±0.40 mm to 44.85±0.20 mm in shell length and from 13.27±0.32 g to 20.73±0.36 g in weight. In both cases, mixed-species of red algae produced better growth in shell length and weight. This may be because abalone in the

wild rarely feed on single species and they frequently encounter a variety of drift algae. It may also be due to the fact that nutrients lacking in single-species diets may be provided and/or fortified using a variety of seaweeds, which are locally abundant. Survival rate was 100% in all cages. **(Author's abstract)**

Keywords: *Fisheries, Abalone, Cage culture, Eucheuma arnoldii, Growth, Haliotis asinina, Hyuntia edulis, Halymenia durvillaei*

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0373

Growth performance of the mangrove red snapper (*Lutjanus argentimaculatus*) in freshwater pond comparing two stocking densities and three feed types

Frederick B. Muyot, Myleen L. Magistrado, Myla C. Muyot, Maria Theresa M. M

The mangrove red snapper *Lutjanus argentimaculatus* (Forsskål 1775) is a high value, euryhaline marine fish with potential as a species for freshwater aquaculture. This study evaluated the growth and cost efficiency of the species in a freshwater pond in two experiments with three replications: (a) comparing stocking densities: (1) 0.5; (2) 1; and (3) 3 fish fish•m⁻² reared for six months fed three times a day with trash fish to apparent satiation; and (b) comparing feed types: (1) trash fish; (2) moist diet; and (3) formulated dry pellet at a stocking density of 1 fish•m⁻² fed to apparent satiation three times a day for seven months. The stocking density (SD) experiment showed significantly higher weight gain, absolute growth and specific growth rate ($P < 0.05$) in 0.5 fish•m⁻² SD (184.9 g; 1.04 g•day⁻¹; 2.50%/day) than 3 fish•m⁻² SD (172.7 g; 0.96 g•day⁻¹; 2.38 %• day⁻¹). No significant difference was detected between 0.5 fish•m⁻² SD and 1 fish•m⁻² nor between 1 fish•m⁻² and 3 fish•m⁻² ($P > 0.05$). Survival rate (SR) and feed conversion ratio (FCR) were not statistically different between treatments ($P > 0.05$), which ranged from 78% to 92% and 5.0 to 5.9, respectively. Cost analysis showed high net returns for 1 and 3 fish•m⁻² SD but low in 0.5 fish•m⁻² SD. The feeding experiment study showed that feed types significantly affected weight gain, SGR, and SR ($P < 0.05$). Snappers fed with trash fish attained significantly higher mean absolute growth (298.2 g) and SGR (1.81%/day) than those fed moist feeds (232.8 g and 1.61%/day, respectively) and formulated feeds (236.1 g and 1.51%/day, respectively). The survival rate was significantly higher in snappers fed trash fish (93.33%) and dry pellets (94.00%) than fed moist feeds (81.34%). FCR in trash fish, moist and dry pellet treatment was 6.4, 6.3, and 2.7, respectively. Cost analysis showed high net returns for trash fish and formulated pellet fed snappers but low in moist diet feed treatment. Cost-benefit analysis showed the feasibility of mangrove red snapper for freshwater aquaculture at a recommended stocking density of 1 to 3 fish•m⁻² using trash fish, moist diet, or formulated dry pellet.

Keywords: *mangrove red snapper, freshwater aquaculture, pond culture, moist diet, formulated dry pellets, Fisheries*

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(Filipiniana Analytics)

0374

Marine Ecosystem Protection Trade-off Economic Model with Terrestrial Ecosystem Exploitation in Fishing Communities near Marine Protected Areas

Mirasol, Joy M. , Abocejo, Ferdinand T. , Padua, Robe

The total ban on fishing in marine protected areas demands entailed that fisherman in nearby fishing communities look for an alternative means of livelihood. Often, such alternative livelihoods exploit the remaining terrestrial ecosystem found within or near these fishing communities. This paper introduced a trade-off economic model for marine protection-terrestrial exploitation through a Marine Protection Terrestrial Exploitation Curve (MPTEC). The peculiar characteristics of the fishing communities near marine protected areas (MPAs) are inputted to the trade-off model. Simulation results revealed that for the optimistic case (communities which are better educated and with small household sizes), the terrestrial ecosystems' damage rate ranged from 3.7% to 28% for MPA sizes ranging from 3 hectares to 30 hectares, while in the worst case scenario (communities which have 6 years or less of schooling and with larger household sizes), the estimated damage rates for the terrestrial ecosystems ranged from a low of 8% to a high of 37% for the same range of MPA sizes. Damage to the terrestrial ecosystems within the fishing communities close to marine protected areas can be mitigated by minimizing the exploitation rate ρ which in turn depends on the socio-demographic characteristics of these communities. Alternative livelihood programs for affected fishing communities should veer them away from livelihoods that make use of raw materials coming from the various terrestrial ecosystems, e.g. mangroves. Ecotourism is one such livelihood project recommended following the Apo Island, Negros experience in the Philippines. **(Author's abstract)**

Keywords: Trade -off model, Marine protection, Terrestrial ecosystem, Stochastic model, Fisheries

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NP

0375

Quality assessment of processed sandfish (*Holothuria scabra*) using papaya leaves to remove its hard spiculy layer

Adoracion V. Obinque, Vivian T. Nebres, Virginia H. Delos Santos, Gielenny M. Salem, Junwell S. Cabigao, Charlotte Ann M. Ramos, Ariel Joshua J. Madrid, Rosario J. Ragaza, Rosa A.

The presence of chalky deposits or hard outer covering and extraneous matter are some reasons for product downgrading of dried sandfish, *Holothuria scabra*, locally known as *balat* or *balatan*. Various amounts of fresh papaya leaves, namely, 50, 75, 100, 150, and 200 grams, were used to test its effectiveness in removing the hard spiculy layer on cooked sandfish and assessing its product quality. Results showed that using 75 grams of papaya leaves with 80 minutes of brushing time was found to be effective as 71-85% of the hard spiculy layer was removed. The final products' colors were black to brown, no off-odor or decomposition detected, with a hard texture and completely dried product. The mean water activity (A_w) was 0.787, an amount within the range of 0.80-0.60 for dried foods, and the mean moisture content was 4.31%, which is far below the acceptable limit of 15% for dried sea cucumber. In addition, the dried sandfish had 69.5% protein, 1.42% fat, 1.88% total carbohydrates, and 298 kcal food energy. The study was conducted on a laboratory scale only, and commercialization should be carried out.

Keywords: *balat, balatan, sea cucumber, processing, papaya leaves, papain, hard spiculy layer, Fisheries*

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0376

Reproductive biological performance of *Otolithes ruber* (Bloch and Schneider 1801) in San Miguel Bay, Philippines

Errol M. Gallego, Jethro Emmanuel P. Baltar, Noemi SB. La

The tigertooth croaker, *Otolithes ruber* (Bloch and Schneider 1801), was studied to determine its reproductive biology characteristics for 34 months from March 2015 to November 2017. A total of 7,977 individuals were sampled and the measured total lengths (TL) ranged from 8.1 cm to 32.1 cm (16.70 ± 2.53 cm) and 10.0 cm to 33.5 cm (17.95 ± 2.95 cm) for male and female, respectively. The length-weight relationship can be summarized as $W = 0.00521 L^{3.18}$ and $W = 0.00837 L^{3.01}$ for female and male, respectively. The length at first maturity of this species was determined to be 13.95 cm, which is smaller compared to other studies. The overall sex ratio of this species was 1:0.8, with males dominating the female sex ($P < 0.05$, $X^2 = 64.3$). In addition, synchronized development of male and female gonads was observed. It was also verified that mature individuals were present all throughout the study period indicating that this species spawn continuously and the presence of juveniles during the sampling period indicated continuous recruitment. Mean monthly GSIs indicate July to November as the main spawning season of this species. The in-site occurrence of mature and juvenile stocks in the bay further implicates that San Miguel Bay is a nursery ground for this species. The fecundity varied between 3,420 to 422,100 with an average fecundity of 86,142 eggs. Lastly, the spawning potential ratio is still above the limit reference point ($SPR = 0.36$), indicating that the stock can still replenish their biomass.

Keywords: *abo, fecundity, gonado-somatic index, sex ratio, spawning season, reproductive biology, San Miguel Bay, Fisheries*

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0377

Screening of ciguatoxins in the Philippines by animal assay: symptoms, levels, and distribution in fish tissue

Bryan E. Tanyag, Karl Bryan S. Perelonia, Flordeliza D. Cambia, Ulysses M. Mon

The Philippines is an archipelagic country that belongs to the biologically diverse Pacific Coral Triangle, rich in marine resources, including corals, reef fishes, and algae. This explains the continuous sustenance of the Filipinos on fish as a major protein source. Despite their contribution to human consumption, some commercially important coral reef fishes are a threat to food safety, compromising public health. Currently, ciguatera fish poisoning (CFP) has been focused on by scientists since it is the most frequently reported seafood-toxin illness in the world acquired from contaminated coral reef fishes. The present study investigates the contamination of reef fishes in the West Philippine and Sulu Seas using animal assay. Ciguatoxins (CTX) are present in commercially important reef fishes such as barracuda (*Sphyraena barracuda*), parrotfish (*Scarus quoyi*), rabbitfish (*Siganus guttatus*), grouper (*Plectropomus leopardus*), moray eel (*Gymnothorax melanospilos*), and snapper (*Lutjanus campechanus*). *Scarus quoyi* had the highest toxicity of 0.65 ± 0.55 ppb and 0.48 ± 0.36 ppb found in flesh and viscera, respectively. Although higher toxicities were observed from fish viscera, toxicities between fish parts did not vary greatly ($p > 0.05$). Positive samples exceeded the 0.01 ppb guideline established by the US Food and Drug Administration and the Philippines' regulatory limit set by the Bureau of Fisheries and Aquatic Resources. Symptoms of mice showing the presence of Pacific CTX-1 were noted. Since mouse bioassay was used in screening reef fishes that pose non-specificity and insensitivity problems, the researchers suggest that analytical methods must be used in characterizing and quantifying these types of toxins. Establishing the methodologies in detecting CTX would greatly help monitor and manage CFP in commercially identified reef fishes in the country.

Keywords: *food safety, ciguatera, toxic reef fish, West Philippine Sea, Sulu Sea, Fisheries*

**A study on the distribution and level of cadmium in scallop *Bractechlamys vexillum*
(Reeve 1853) from the Visayan Sea, Philippines**

Riza Jane S. Banicod, Kathlene Cleah D. Benitez, Gezelle C. Tadifa, Bryan E. Tanyag, Flordeliza D. Cambia, Ulysses M. Montojo, Karl Bryan S. Per

Bivalves such as scallop *Bractechlamys vexillum* are considered an essential resource for livelihood and revenues in the Visayan Sea, central Philippines. To date, there are several reports that the local marine ecosystems are contaminated with heavy metals like cadmium; hence, these species are also susceptible to bioaccumulation of cadmium because they feed mainly by filtering particles from contaminated water. In recent studies, scallops are suggested to be a potential bioindicator for cadmium contamination due to their ability to accumulate and tolerate the metal. This research aims to examine the anatomical distribution of cadmium in *B. vexillum* and measure the relationship between shell weight and cadmium concentration. The sites for this study include Carles, Iloilo, Madridejos, Cebu, and Cawayan, Masbate. Five organs were analyzed: adductor muscle, digestive gland, gonad, gill, and mantle. The analysis for quantification of cadmium in the different scallop parts was carried out by Inductively Coupled Plasma – Optical Emission Spectrometry (ICP-OES Model ICPE-9820, Shimadzu, Kyoto, Japan). Results showed that cadmium preferentially accumulates in the digestive gland, accounting for 76.39% of the total metal concentration. Moreover, a significant positive correlation ($r = 0.798$, $p < 0.01$) between the cadmium content in the whole digestive gland and shell weight were observed. Thus, this tissue tends to have a potential marker of metal contamination in the environment.

Keywords: *cadmium, anatomical distribution, scallop, Visayan Sea, contamination, Fisheries*

**Supply and value chain analysis of freshwater sardine, *Sardinella tawilis* (Herre 1927),
in Taal Lake, Batangas, Philippines**

Myla C. Muyot, Rielyn L. Balunan, Maria Theresa M.

The supply and value chain of the world's only freshwater sardine, *Sardinella tawilis* endemic to Taal Lake, were studied from January to December 2016. This study aimed to identify the actors in the value chain, evaluate each actor's value addition, identify the roles of men and women in the chain, and identify the issues, concerns, and entry points for intervention. Key informant interviews, focus group discussions, and tracer survey interviews were done to gather data. A semi-structured questionnaire was directed to 189 respondents within and outside Taal Lake. The study showed that the *tawilis* marketing system is limited to the local market. *Tawilis* is traded fresh and processed. The chain's key actors include the fishers, fish buyers (wholesaler, retailer, peddlers, and contracted fish buyers), processors, and consumers. The outcome of the value chain analysis of the *tawilis* industry showed that commercial processors have the highest value-added due to the place, form, and time transformation of the product. Meanwhile, the fishers and small-scale fish buyers have the lowest value-added during lean and peak season, respectively. The *tawilis* industry provides livelihood to the marginal fisherfolk, which is the first supply chain link. Several strategies were recommended in the form of process, product, function, and overall upgrading to uplift the economic benefit of the different actors in the chain and boost the *tawilis* industry. These

include the improvement on the fishing operations, upgrading of fishing gear and other paraphernalia, provision of training on post-harvest techniques (handling, preservation, processing, value-adding, product development, etc.), market matching strategies, improvement in farm to market road transportation, establishment of fish processing facilities, and access to credit, loans or grants from the national and local governments.

Keywords: *Sardinella tawilis*, value chain analysis, Taal Lake, stakeholders, Fisheries

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FOOD SCIENCE AND TECHNOLOGY

0380

Antioxidant, anticancer and ACE-inhibitory activities of bioactive peptides from wheat germ protein hydrolysates

Karami, Zohreh , Peighambaroust, Seyed Hadi , Hesari, Javad , Akbari-Adergani, Behrouz , Andreu, David

Hydrolysates of wheat germ protein prepared with Alcalase, pepsin or proteinase K had significant antioxidant activities and the ability to decrease A549 cell viability in a concentration-dependent manner. Hydrolysates were fractionated using RP-HPLC and the antioxidant activity of fractions was evaluated as ABTS radical scavenging activity. Fractions with the highest activities were further analyzed using LC/ESI-MS/MS. Two peptides, KELPPSDADW and SSDEEVREEKELDLSSNE of the pepsin hydrolysates, three peptides, TVGGAPAGRIVME, VGGIDEVIAK and GNPIPREPGQVPAY of the Alcalase hydrolysates, and two peptides SGGSYADELVSTAK and MDATAALHYENQK of the proteinase K hydrolysates were identified as the main components. Replicates of these peptides were made using solid phase synthesis and further biological activities, including antioxidant, ACE inhibitory and cytotoxic activities were evaluated. Peptides with the highest activities were KELPPSDADW (antioxidant), SGGSYADELVSTAK (ACE inhibitory) and SSDEEVREEKELDLSSNE (cytotoxic). **(Author's abstract)**

Keywords: *Wheat germ protein, Pepsin, Alcalase, Proteinase K, Bioactive peptides, Food science and technology*

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0381

Basic composition, antioxidant activity and nanoemulsion behavior of oil from mantis shrimp (*Oratosquilla nepa*)

Chaijan, Manat , Panpipat, Worawan

Oils from whole mantis shrimp (MS) (*Oratosquilla nepa*) at two maturity stages, including normal (NMS) and egg-bearing (EMS), were characterized. The lipids of both NMS and EMS were 1.3% (w/w). Oleic acid was the major fatty acid (FA) and DHA was the predominant PUFA in both MS oils and their phospholipid (PL) fractions. The EMS oil had higher cholesterol than the NMS oil ($p < 0.05$). Higher total tocopherols (49.7 vs 40.6 mg/100 g oil), astaxanthins (2.8 vs 1.9 g/100 g oil) and PL (54.7 vs 40.6 g/100 g oil) were observed in the NMS oil ($p < 0.05$). The NMS oil showed better DPPH• and OH• scavenging activities and reducing power but lower ABTS⁺ and H₂O₂ scavenging activities. The NMS oil-loaded nanoemulsions, prepared with different ratios of

Span 80 and Tween 80, had smaller and more homogenous sizes (106-238 nm, PDI <0.7) with higher stability. The oil droplet size generally decreased with increasing Tween 80 content (p<0.05). Thus, the NMS oil had a good nutritional profile and could potentially be used with functional foods and supplements. **(Author's abstract)**

Keywords: *Mantis shrimp oil, Oratosquilla nepa, Nanoemulsion, Food science and technology*

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0382

Beverage Consumption of Filipino Children and Adolescents (7th National Nutrition Survey): National Concerns and Potential Policy Implications

Golloso-Gubat, Maria Julia , Magtibay, Edward Vincent J. , Gironella, Glen Melvin P. , Tajan, Merlyn G. , Constantino, Ma. Adrienne S.

The extent of contribution of beverage intake to obesity in Filipino children and adolescents is unknown. The present study determined the amount of beverages consumed by Filipino children and adolescents and the association of energy intake from beverages with BMI. This is a cross-sectional study utilizing 24-hr food recall data from the 7th National Nutrition Survey (NNS). Mean amounts of beverages consumed and corresponding energy intake from beverages were calculated utilizing descriptive statistics; one-way ANOVA to determine and compare mean energy intake from beverages by BMI-for-age z-scores category. Pearson's correlation analysis was utilized to test the association between the mean energy intake per day from beverages and BMI. Beverages contributed 17% and 3% to mean energy intake per day of pre-school children, and schoolchildren and adolescents, respectively. Association between energy intake from beverages and BMI was significant but weak. Results indicated that beverages contribute a small amount to mean energy intake of children and adolescents. Although consumption of sugar-sweetened beverages was noted, caloric intake from beverages was weakly associated with BMI. Nevertheless, beverage consumption pose potential nutritional consequences that can be translated into home and school guidelines/ recommendations and strengthen national policy options that would encourage healthy beverage choices. **(Author's abstract)**

Keywords: *Caloric intake, Childhood obesity, Sugar sweetened beverages, Food science and technology*

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0383

Blood Glucose Lowering Effect of Rice-Corn Mix Consumption Among Individuals with Type 2 Diabetes

Juanico, Clarissa B. , Hurtada, Wilma A.

The 2013 National Nutrition Survey conducted by the Food and Nutrition Research Institute (FNRI) revealed that the prevalence of diabetes in the Philippines increased significantly from 4.8% in 2008 to 5.4%. Quality protein maize (QPM), specifically, IPB Var 6 corn, is a promising alternative staple for individuals with type 2 diabetes mellitus (T2DM) because of its moderate glycemic index, higher amylose, and high fiber content compared to well-milled rice. This randomized controlled feeding trial aimed to determine the effect of substituting IPB Var 6 corn grits on the glycemic response, namely glycosylated hemoglobin (abbreviated as HbA1c), fasting blood sugar (FBS) and post-prandial blood glucose (PPBG). Fifty-one individuals with T2DM were randomized into three

groups: rice, corn or rice-corn mix and lunch feeding trial was done for 12 wk. Results showed significant reduction in HbA1c ($p=0.0009$) and FBS ($p=0.0069$) across the three groups. There was also a significant ($p=0.0041$) positive association ($r=0.67470$) between HbA1c reduction and consumption of lunch composed of 100% corn grits, but insignificant ($p=0.4471$) with 30% corn grits. This suggests that as the amount of staple with 100% corn grits consumed is increased, the improvement in HbA1c may also increase. The odds ratio estimate ($OR=1.014$) indicates that FBS is more likely to decrease with the consumption of corn grits. The results suggest that a substantial effect on the long-term glycemic response measured by HbA1c is possible if higher amount of pure IPB Var 6 corn grits is consumed daily. **(Author's abstract)**

Keywords: Diabetes, Glucose lowering, Glycemic index, IPB Var 6 corn, Randomized controlled trial, Food science and technology

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0384

Chemical and functional properties of durian (*Durio zibethinus* Murr.) seed flour and starch

Barahenga, Surayani, Karrila, Taewee

Durian (*Durio zibethinus* Murr.) seeds are a waste from durian paste processing that could find applications in food or non-food industries. Durian seeds are mainly composed of starch and mucilage (gum), which influence its properties and hence the potential applications. The objective of this research was to compare the properties of durian seed flour in different forms. Chemical and functional properties were compared among whole durian seed flour (WDSF), demucilaged durian seed flour (DDSF), and durian seed starch (DS), for two varieties of durian called native (N) and Chanee (C). It was found that the durian variety made little difference in chemical and functional properties, in contrast to the processing of the sample. WDSF contained both starch and gum, and had significantly ($p < 0.05$) more protein, lipid, ash, and fiber than DDSF or DS. The functional properties of WDSF, especially swelling power, water absorption capacity, peak viscosity and emulsifying capacity and activity, were also significantly higher than for DDSF or starch. Among the three forms of durian seed, WDSF showed the lowest gel hardness but highest syneresis, due to its high ability to bind with water to form a weak gel network. In conclusion, the three forms of durian seeds showed different properties. Gum or mucilage in durian seeds had important roles in the functional properties. **(Author's abstract)**

Keywords: Durian (*Durio zibethinus* Murr), Durian seed flour, Durian seed starch, Durian seed gum, Durian seed mucilage, Food science and technology

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0385

Chitosan and water-soluble chitosan effects on refrigerated catfish fillet quality

Bonilla, Franklin, Chouljenko, Alexander, Lin, Andy, Young, Britt M., Goribidanur, Tanishq Sai, Blake, James C., Bechtel, Peter J., Sathivel, Subramaniam

Chitosan's water insolubility restricts its use in some food systems. However, when treated with enzymes, a water-soluble chitosan is developed, which overcomes insolubility. The aim of this study was to evaluate the effect of chitosan and water-soluble chitosan applications on refrigerated catfish fillet quality. Fresh catfish fillets were separately vacuum tumbled with distilled water, 1% acetic acid, chitosan (0.5% in acetic acid), and water-soluble chitosan (0.5% in distilled water). Sampling was done at 0, 5, 10, 15, and 20 days. The fillets were analyzed for lipid oxidation, aerobic plate counts, yeast and mold counts, cutting force, color, and pH. Triplicate experiments were done and the data were statistically analyzed at a significance level of 0.05. Water-soluble chitosan had 86%±2% water solubility compared to 1.9%±0.2% for chitosan. Fillets treated with water-soluble chitosan solution had lipid oxidation reduced by approximately 70% compared to untreated fillets during 20 days of refrigerated storage. Chitosan treated fillets showed the highest inhibition with aerobic plate, yeast and mold counts. Initially, fillets treated with acetic acid and chitosan solutions had a more rapid decrease in hardness than those vacuum tumbled with water-soluble chitosan and distilled water. Therefore, this study showed both the advantages and limitations of applying chitosan or water-soluble chitosan for preserving catfish fillet quality during refrigerated storage. (Author's abstract)

Keywords: *Chitosan, Water-soluble chitosan, Catfish, Ictalurus punctatus, Food science and technology*

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0386

Copigmentation of cyanidin 3-O-glucoside with phenolics: Thermodynamic data and thermal stability

Kanhaa, Nattapong , Surawanga, Suthat , Pitchakarnb, Pornsiri , Regensteinc, Joe M. , Laokuldilok, Thunnop

The intermolecular copigmentation of cyanidin-3-O-glucoside (C3G) with three colorless phenolic compounds and its thermal stability were investigated. The influence of the copigment (ferulic acid, dopamine, or (+)-catechin), the pigment-to-copigment molar ratio (1:1, 1:10, and 1:100), the pH value (pH 3–7), and the temperature (20, 30, 40, and 50 °C) on the copigmentation effect, stoichiometric ratio (n), the equilibrium constant (K), and thermodynamic parameters (ΔG° , ΔH° , and ΔS°) were obtained. The strongest immediate copigmentation reactions were observed at pH 3 and 1:100 molar ratio, being significantly higher with (+)-catechin, followed by ferulic acid and then dopamine. The greatest hyperchromic shift was found in the complex of C3G/(+)-catechin, which was reasonable for its n and K values of 0.7 and 17.1, respectively. Moreover, the reactions were favored at low temperature. The thermodynamic data indicated that all these complexes were formed by spontaneous exothermic reactions. The C3G/(+)-catechin complex at the molar ratio 1:100 exhibited the greatest thermodynamic properties, with negative values of ΔG° (-6.92 kJ/mol), ΔH° (-38.7 kJ/mol), and ΔS° (-108.0 J/K/mol). The C3G/(+)-catechin complex exhibited a low E_a value (78 J/mol), indicating greater thermal stability against temperature change compared with those with the other phenolic pigments. In addition, copigmentation of anthocyanins in mulberry juice with (+)-catechin significantly reduced the loss of anthocyanins during pasteurization (80 °C for 15 min). (Author's abstract)

Keywords: *Ferulic acid, Dopamine, (+)-catechin, Anthocyanins, Cyanidin-3-O-Glucoside, Mulberry juice, Food science and technology*

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0387

Development of vitamin A-rich pasta using rice bran flour as partial substitute to wheat flour

Giagonia, Lind

Micronutrient deficiencies are a continual lack of nutritional vitamins and minerals and constitute a huge public health problem. Vitamin A deficiency increases vulnerability to a variety of illnesses which includes diarrhoea, measles, and respiratory infections where it is common amongst children. In order to address this, great interest in rice bran has led in the discovery of various health benefits. With this, the study aimed to develop a pasta using the rice bran as partial substitute to wheat flour and to determine the Vitamin A content of the rice bran pasta in comparison to commercially available pasta. The rice bran has undergone dry heating method at 130°C for 20 minutes and was formed into dough. The sample pasta was then analyzed for proximate analysis which consists of moisture content, ash, carbohydrates, protein, fat and crude fiber. Vitamin A content analysis was also conducted. Moreover, aerobic plate count, yeast and mold count was observed for microbial activity. It was found out that the rice bran pasta is high in Vitamin A showing a high content of 188 µgRE/100g which is 47% of the recommended dietary allowance compared to the commercially available pasta. Researchers recommend developing a rice bran pasta that should be cut and shaped into different sizes, undergo further tests with different ratios of rice bran flour and can be used for supplementary feedings in the community. From this study, it can be concluded that rice bran is safe for human consumption and can be used as a food supplement.

Keywords: Food science and technology, substitute, proximate composition, vitamin A content, micronutrient deficiency supplement, rice bran pasta

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0388

Edible coatings on Gouda cheese as a barrier against external contamination during ripening

Berti, Sofia , Olle Resa, Carolina P. , Basanta, Florencia , Gerschenson, Lia N. , Jagus, Rosa J.

Cheese surfaces can be colonized by undesirable microorganisms during the different processing stages, with ripening being the most affected. Consumers demand have increased the interest in using natural antimicrobials such as natamycin and nisin, and edible coatings that help with food preservation. The ripening of Gouda cheese treated with an edible coating based on tapioca starch and glycerol containing natamycin and nisin (*GNANI*) was studied. The results were compared with the method used in the cheese industry to prevent surface contamination, which means, cheese covered with an aqueous suspension of the same antimicrobials (*CNANI*). It was observed that these coatings did not alter the physicochemical properties (pH, ash, protein, chloride, water activity, ripening index, and color) and the development of Lactobacilli that takes place during the ripening of Gouda cheese. However, cheese covered with *GNANI* was harder, more gummy and more chewable than cheese covered with *CNANI* at the end of storage. The *GNANI* applied on Gouda cheese resulted in an improved barrier against external contamination during ripening, compared to *CNANI*, for the growth of a mixed culture of *Saccharomyces cerevisiae* and *Listeria innocua*. **(Author's abstract)**

Keywords: Edible coating, Natamycin, Nisin, Gouda cheese, *Saccharomyces cerevisiae*, *Listeria innocua*, Food science and technology

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Effect on lipid metabolism of mice continuously fed a crab-containing diet

Wang, Ting , Xiao, Xinfeng , Regenstein, Joe M., Wu, Wenhui , Zhou, Yu , Wang, Shujun, Cheng, Yongxu , Wu, Xugan , Bao, Bin

Chinese mitten crab (*Eriocheir sinensis*) is a traditional food in eastern Asian. The effects of diets containing edible-parts of female Chinese mitten crabs were studied in vivo using male mice. A short-term experiment of 20 days and a long-term experiment of 66 days were run. Some lipid metabolic compounds in liver were analyzed including fatty acid synthetase (FASN), 3-hydroxy-3-methylglutaryl coenzyme A reductase (HMG-CoA), and lipoprotein lipase (LPL). Serum lipid indexes included total cholesterol (TC), triglycerides (TG), low-density lipoprotein cholesterol (LDL-C) and high-density lipoprotein cholesterol (HDL-C). Mice eating the crab diet (Group T1) gained ~4.0% and ~10.5% body weight in short-term and long-term experiment, respectively (~8.8g at day 20 and ~18.5g at day 66). Mice took crab diet without significantly increased risk of cardiovascular disease according to lipid comprehensive index (LCI) and atherosclerosis index (AI) ($P \geq 0.05$). There were no significant effects on blood lipids and enzyme concentrations in liver when the crab-containing diets were eaten either continuously or intermittently. A slight decrease of LPL, TC, and LCI was seemed with consumption of the crab diet every 16 days in long-term experiment. In conclusion, mice continuously fed the crab diet did have a slightly adverse effect on lipid metabolism, while the crab diets eaten intermittently may have a small beneficial effect on male mice blood lipids, body weight, and the potential of LCI and AI, which means taken crab intermittently may help to lose weight and preventive against cardiovascular disease. (Author's abstract)

Keywords: Chinese mitten crab, *Eriocheir sinensis*, Atherosclerosis, Serum lipoproteins, Mice, Food science and technology

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Effects of hydrocolloids on the rheological and microstructural properties of semisolid whey protein-rich systems

Li, Juan , Wu, Yuting , Lu, Naiyan , Liu, Dasong , Regenstein, Joe M., Zhou, Peng

Effects of xanthan gum (XG), κ -carrageenan (KC) and gum Arabic (GA) on rheological properties and microstructural properties of semisolid whey protein-rich systems were studied. Results of oscillation frequency sweeps and temperature ramp experiments indicated that whey protein-rich systems containing XG and KC formed a viscoelastic structure that had different rheological properties compared to GA. XG or KC intensified the rheological properties of whey protein-rich systems, while forming an additional network separate from the whey protein isolate (WPI). The double-labelled (WPI and hydrocolloids) micrographs showed that a continuous network structure formed with 1% added XG or KC while the system maintained a relative homogeneous structure with GA. Small-angle X-ray scattering (SAXS) also confirmed that an ordered structure was formed when the XG or KC reached 1%. Furthermore, these ordered structures were not completely destroy with heat. (Author's abstract)

Keywords: Whey proteins, Xanthan gum, #954-carrageenan, Gum Arabic, Rheological properties, Microstructural properties, Food science and technology

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Effects of pH on self-assembly of silver carp myosin at low temperature

Wei, Li, Cao, Liwei, Xiong, Shanbai, You, Juan, Hu, Yang, Liu, Ru

The effects of pH on myosin self-assembly at low temperature to improve the structural attributes by controlling the solution conditions were studied. Myosin from silver carp was dissolved in solutions at various pH (5.0, 5.5, 6.0, 6.5, 7.0, 8.0 and 9.0). Effects of pH on the particle size, intermolecular forces, and micro-morphology of myosin at low temperature were investigated. The structures of myosin assemblies were observed to be influenced by varying pH using the variations in the degree of protonation and surface charge state of myosin molecules. The low electrostatic repulsion in acidic conditions resulted in the assembly before unfolding of myosin, leading to a relatively high turbidity and UV absorption as well as a decreased solubility. Confocal laser scanning microscopy analysis showed that myosin assemblies with coarse filamentous structure were formed in acid conditions. In alkaline conditions, the increased electrostatic repulsion led to a higher rate of unfolding than assembly and exposure of more hydrophobic residues, as showed by increased S0-ANS values and free SH contents. This relatively high rate of unfolding contributed to the formation of assemblies with a fine and ordered structure. At pH 7.0, the most active structure of myosin molecules was maintained as shown by the highest Ca²⁺-ATPase activity. Myosin assemblies with an ordered and uniform structure were obtained at pH 7.0. (Author's abstract)

Keywords: *Myosin, Hypophthal michthys, Molitrix, Self-assembly, Silver carp, Food science and technology*

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Effects of UV-B radiation on phenolic accumulation, antioxidant activity and physiological changes in wheat (*Triticum aestivum* L.) seedlings

Chen, Zhijie, Maa, Yan, Weng, Yan, Yang, Runqiang, Gu, Zhenxin, Wang, Pei

The production of secondary metabolites and the antioxidant defense systems could be activated in response to ultraviolet-B (UV-B). The effects of UV-B radiation on the phenolic content, antioxidant activity, and physiological changes in wheat seedlings were investigated. Results showed that the free, bound and total phenolic contents and antioxidant activities significantly increased in wheat seedlings after UV-B exposure from the third and fourth day. UV-B radiation of 20 $\mu\text{W}/\text{cm}^2$ led to the highest accumulation of phenolics. Total phenolics, DPPH and ABTS values significantly increased by 26.3, 25.1 and 12.0%, respectively, on day 4 as compared to unirradiated wheat seedlings. The highest respiratory rate and phenylalanine ammonia-lyase activity were also observed with the radiation. The increased UV-B radiation intensified the lipid peroxidation in wheat seedlings and changed the activities of antioxidant enzymes involved in the scavenging of reactive oxygen species. The activities of superoxide dismutase, peroxidase and catalase decreased, while the ascorbate peroxidase activity increased with the enhanced UV-B radiation intensity. This study showed that wheat seedlings could be developed as a functional food ingredient after moderate UV-B radiation. (Author's abstract)

Keywords: *Triticum aestivum, UV-B radiation, Phenolic compounds, Antioxidant enzymes, Wheat seedlings, Food science and technology*

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Hydrolysates from rainbow trout (*Oncorhynchus mykiss*) processing by-products: Properties when added to fish mince with different freeze-thaw cycles

Nikoo, Mehdi, Benjakul, Soottawat, Gavlighi, Hassan Ahmadi, Xu, Xueming, Regenstein, Joe M.

Rainbow trout (*Oncorhynchus mykiss*) mixed processing by-product homogenates were subjected to 8â€mM CaCl₂-5 mM citric acid (1:5 w/v) pretreatments followed by hydrolysis with Alcalase (W-CaCi-RTBH). These hydrolysates decreased the loss of total sulfhydryl groups, protein solubility and protein carbonyl formation in a fish mince after 6 freeze-thaw cycles (Pâ€≤â€0.05). The thermal properties of myosin heavy chains and actin were maintained as shown using differential scanning calorimetry (DSC) (Pâ€≤â€0.05). Based on low field NMR T2 relaxation, the fastest relaxation component (T21) showed no changes with addition of W-CaCi-RTBH into a fish mince after 6 freeze-thaw cycles, indicating no changes for the major pool of water molecules within the myofibrillar protein structure (Pâ€≥â€0.05). After 6 freeze-thaw cycles, W-CaCi-RTBH had better antifreeze activity when combined with sucrose – sorbitol (4%) (Pâ€≤â€0.05). Therefore, W-CaCi-RTBH could potentially be an additive in frozen fish mince. (Author's abstract)

Keywords: *Rainbow trout, Alcalase, Frozen fish mince, Food science and technology*

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Isolation of yeast strains from Chinese liquor Daqu and its use in the wheat sourdough bread making

Xu, Dan, Yin, Yun, Ali, Barkat, Zhang, Yao, Guo, Lunan, Xu, Xueming

Two yeast strains, *Meyerozyma guilliermondii* EH1 and *Pichia kudriavzevii* EP1, together with *Lactobacillus sanfranciscensis* DSM20451^T were used as mixed starter cultures on sourdough bread making. Both yeast strains isolated from Chinese liquor Daqu were selected among 79 isolates by primary sensory evaluation of bread and growth test with *L. sanfranciscensis* during sourdough fermentation. High growth rate, resistance to acid and osmotic pressures were observed for both yeast strains. In presence of *L. sanfranciscensis*, *M. guilliermondii* EH1 and *P. kudriavzevii* EP1 exhibited higher growth rates and yields in wheat flour sourdough. Production of organic acids, specific loaf volume, crumb texture, crumb colour, staling rate, and volatile composition of the sourdough bread was evaluated. The results showed that the use of isolated yeast strains led to the higher accumulation of esters, aldehydes and other aroma compounds. Our findings demonstrated improved flavour complexity and increased consumer acceptance of bread using mixed starters. (Author's abstract)

Keywords: *Chinese liquor Daqu, Yeast isolation, Mixed starter, Sourdough bread, Volatile compounds, Food science and technology*

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Maltodextrin or gum Arabic with whey proteins as wall-material blends increased the stability and physicochemical characteristics of mulberry microparticles

Khalifa, Ibrahim , Li, Mengli , Mamet, Torkun , Li, Chunmei

The efficiency of various encapsulating wall-materials on the stability and the characteristics of polyphenols in mulberry juice microparticles were studied. The ternary mixtures of maltodextrin (MD), gum Arabic (GA), and whey proteins (WP) were used as wall-materials and mulberry juice polyphenols were used as the core using a simplex-lattice experimental design. The mixture was then spray dried and the physicochemical properties of the powder were measured. In addition, the storage stability of polyphenols in both powder and reconstituted juice were measured. The WP-based samples had the highest powder yield and smallest particles using scanning electron microscopy. MD led to higher solubility, hygroscopicity, color stability, and anti- α -glucosidase activity. The combined wall-materials, especially, WP with GA or MD, increased the polyphenols stability and their antioxidant capacity during storage better than their individual counterparts. It was determined that the binary mixtures of proteins and carbohydrates gave better properties for manufacturing mulberry juice microparticles. **(Author's abstract)**

Keywords: *Gum Arabic, Maltodextrin, Whey proteins, Mulberries, Morus australis poir, Food science and technology*

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A novel maltooligosaccharide-forming amylase from *Bacillus stearothermophilus* *Wang, Yinglan , Pan, Sihui , Jiang, Zihang , Liu, Siyu , Feng, Yan , Gu, Zhengbiao , Li, Caiming , Li, Zhaofeng*

A novel maltooligosaccharide-forming amylase (MFase) from *Bacillus stearothermophilus* (Bst-MFase) was heterologously expressed in *B. subtilis* and purified by hydrophobic and ion-exchange chromatographies. Bst-MFase, an approximately 58 kDa monomer, could effectively hydrolyze linear α -glucan with DP \geq 6 and slightly hydrolyze maltohexaose. In addition, Bst-MFase was proved to majorly produce maltopentaose and maltohexaose from starch and categorized as a maltopentaose-forming amylase. The action pattern was analyzed using amylopectin and amylose as substrate, showing that Bst-MFase could rapidly reduce iodine blue value. Thus, Bst-MFase was categorized as both a maltopentaose-forming amylase and an endo-amylase. During the initial period (2 h) of amylolysis, Bst-MFase mainly cleaved amylopectin (18.7%) than amylose (14.0%). However, the final conversion rate (24 h) of amylose (68.8%) was slightly higher than that of amylopectin (64.8%). Bst-MFase may have great potential applications in industry due to its highly specific activity, unique substrate specificity, and end-type product pattern. **(Author's abstract)**

Keywords: *Maltooligosaccharide-forming amylase, Bacillus stearothermophilus, Substrate selectivity, Action pattern, Product profile, Food science and technology*

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(Filipiniana Analytics)
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Nutritional and bioactive value of *Rubus* berries

Schulz, Mayara , Chim, Josiane Freitas

Rubus L. (Rosaceae) berries have received worldwide attention, mainly for their nutritional and bioactive value. The raspberries and blackberries of this genus contain nutrients and bioactive compounds such as vitamins, minerals, proteins, sugars, and polyphenols. This review summarizes available data on the physical-chemical characteristics, nutritional composition, biologically active compounds, and biological activities of *Rubus* raspberries (*Rubus idaeus* L., *R. ellipticus* Smith, *R. niveus* Thunb., *R. coreanus* Miquel and *R. occidentalis* L.) and blackberries (*R. ulmifolius* Schott, *R. fruticosus* L., *R. adenotrichus* Schltdl., *R. glaucus* Benth). The composition and the antioxidant, anti-inflammatory, chemopreventive, and antimicrobial activities, as well as the positive effects on blood lipids and atherosclerosis of the *Rubus* berries showed that these fruits are important sources of biologically active compounds, and their biological effects suggest potential uses for human health. **(Author's abstract)**

Keywords: Blackberry, Raspberry, *Rubus*, Fruit nutrients, Polyphenols, Food science and technology

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0398

A peptide-Fe(II) complex from *Grifola frondosa* protein hydrolysates and its immunomodulatory activity

Yuan, Biao , Zhao, Cong , Cheng, Chen , Huang, De-chun , Cheng, Shu-jie , Cao, Chong-jiang , Chen, Gui-tang

Grifola frondosa protein was hydrolysed using Alcalase, and the resulting hydrolysates (CGFP) were filtered using 5 and 1 kDa nominal cut-off ultrafiltration membranes and separated using Sephadex gel chromatography. Two main fractions, named GFP-1 and GFP-2 were obtained. CGFP-Fe and GFP-Fe were synthesized using ferrous chelation. Results showed that the GFP-2 fraction with molecular weight of 963 Da had the highest Fe(II) chelating activity ($2680 \pm 40 \mu\text{g/g}$). UV spectrum showed that the Fe(II) shifted the maximum absorption to shorter wavelengths. The peptides measured using FTIR showed that the GFP-Fe peptide and the un-chelated peptide had different C–O and C=double bondO absorption peaks. The effects of CGFP, CGFP-Fe, GFP2-2 and GFP-Fe on splenocytes proliferation and cytokines secretion were studied in vitro. Both the GFP-2 and GFP-Fe had good immune-enhancing activity. Furthermore, GFP-Fe showed an ability to promote the proliferation of splenocytes and peritoneal macrophages. The iron-chelating peptide of *Grifola frondosa* still maintained its immune enhancing activity after in vitro gastrointestinal digestion. The results suggested that GFP-Fe might be beneficial as a new iron supplement and as an immunological enhancement. **(Author's abstract)**

Keywords: *Grifola frondosa*, Maitake, Fe(II)-Chelating peptides, In vitro gastrointestinal digestion, Food science and technology

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0399

High pressure processing impacts on the hydrolytic profile of milk coagulants
de Castro, Bruno Ricardo , Junior, Leite , Tribst, Alline Artigiani Lima , Ribeiro, Luma Rossi , Cristianini, Marcelo

The hydrolysis of casein (CN) fractions induced by milk-clotting enzymes processed using high pressure processing (HPP) at previously optimized conditions (recombinant chymosin (212 MPa/5 min/10 °C), calf rennet (280 MPa/20 min/25 °C), bovine rennet (222 MPa/5 min/23 °C) and porcine pepsin (50 MPa/5 min/20 °C)) were studied. These enzymes were added to κ -casein (κ -CN) or to casein solutions and the degree of hydrolysis up to 60 min at 35 °C was evaluated using capillary electrophoresis. Compared to non-processed samples, the κ -CN ($p < 0.05$) had a faster hydrolysis, promoted by HPP processed recombinant chymosin (~12%) and calf rennet (~14%). In the casein solution, these enzymes and bovine rennet showed a caseinomacropptide formation 12–18% faster than non-processed ones. Additionally, the hydrolysis profile of α and β -CN fractions were not altered by HPP and, as expected, the hydrolysis of these fractions were more rapid with bovine rennet and porcine pepsin. Thus, HPP may be useful to improve the specific activity of milk-clotting enzymes, without affecting their ability to hydrolyze other casein fractions. **(Author's abstract)**

Keywords: *High pressure processing, Rennet, Recombinant chymosin, Porcine pepsin, Casein hydrolysis, Food science and technology*

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0400

Protection of foods against oxidative deterioration using edible films and coatings: A review

Sahraee, Samar , Milani, Jafar M. , Regenstein, Joe M., Kafil, Hossein Samadi

Edible packaging can be used to decrease food deterioration. Preventing oxidation is based on eliminating exposure of food products to oxygen by removing oxygen from the packaging headspace and/or adding antioxidants to films and coatings to enhance the antioxidant properties of food surfaces. The impact of major factors such as temperature, environmental humidity, polymer chain interactions, and the hydrophilic/lipophilic properties of packaging materials that may affect the quality of edible coatings and films are described. Addition of active compounds to film formulations is a fundamental way to improve mechanical and chemical resistance of films to oxygen. In addition, using the proper packaging materials with different environmental conditions and for different food products is important to avoid oxygen. A lot of studies such as using low density poly ethylene (LDPE)/starch films containing citric acid (CA) for beef, corn zein films containing butylated hydroxyanisole (BHA) for turkey, gelatin films containing tea polyphenol loaded chitosan nanoparticles for fish oil, and milk protein films containing oregano and pimento for beef muscle packaging have been investigated for their potential to work as degradable polymers to carry antioxidants to protect foods. **(Author's abstract)**

Keywords: *Antioxidant, Degradable film, Fat, Food packaging, Meat, Oxidation, Food science and technology*

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0401

Sesame cake hydrolysates improved spatial learning and memory of mice

Shu, Zaixi, Liu, Lingyi, Geng, Pengfei, Liu, Jiawei, Shen, Wangyang, Tu, Mengjie

Age-related decrease in cognition function was shown to be related to oxidative stress, and the study investigated the effect of sesame cake hydrolysates (SCH) on the improvement of learning and memory in mice using the Morris water maze (MWM) test. The mice administered a medium dose (20 mg/kg/d) of SCH did better in learning and memory function compared with the low-dose (10 mg/kg/d), and high-dose (30 mg/kg/d) treated animals with no significant differences in body weight. Biochemical analysis (SOD, GSH-Px, MDA, NO, and AChE) showed SCH improved the antioxidant and AChE activity and reduced the oxidative stress status, although no obvious differences in NO were observed between the control and test groups. qRT-PCR results showed that mRNA expression of CREB, NR2A, and NR2B improved in the test groups, which was consistent with the change of antioxidant capacity. All these results indicated a potential mRNA mechanism for SCH to improve learning and memory ability that was associated with the changes of antioxidant capacity, oxidative stress, and the cholinergic system. **(Author's abstract)**

Keywords: *Sesame cake hydrolysates, Memory, mRNA, Sesamum indicum L, Food science and technology*

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0402

Shelf-stable Dried Okara from the Wet By-products of Philippine Soybean Curd Processing

Azanza, Ma. Patricia V., Gascon, Fredelyn S.

Okara is the wet by-product of silken soybean curd (*taho*) processing and other soybean processing procedures. It has a short shelf life of 12 h under Philippine ambient temperature (30 °C). Without further processing, it is generally used as feed or thrown as waste due to rapid spoilage. A two-stage drying scheme which utilized a manually-operated vertical screw-type press and mechanical dryer was applied to wet okara from a producer of silken tofu. The physicochemical, proximate, microbial, sensory, and rancidity parameters of dried okara were evaluated within its estimated shelf life. Drying of okara to about 5% moisture content extended its shelf life at 30 °C to almost 6 months when packed under vacuum in laminated PET/FOIL/PE (119 µm). End of shelf life was based on rancid odor through sensory evaluation. Shelf stable dried okara was described as yellowish cream, granular powder with slightly sweet, nutty, and moderately beany odor and taste. The proximate composition of freshly dried okara consisted of >20% protein, >10% fat, and >50% dietary fiber. The value added dried okara did not show any strong beany taste which normally limits the use of other dried soybean products as ingredient thus can be utilized as a functional ingredient in various food products. Dried okara can be incorporated into food products to increase the protein and dietary fiber content. **(Author's abstract)**

Keywords: *by-product, Drying, Okara, Shelf life, Soybean, Food science and technology*

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2015 December,
(Filipiniana Analytics)
Fil (S) Q1 P55 144/2 2015

0403

Soybean residue (okara) fermentation with the yeast *Kluyveromyces marxianus*

Hu, Yang, Piao, Chunhong, Chen, Yue, Zhou, Yanan, Wang, Dan, Yu, Hansong, Xu, Baojun

The soybean residue (okara) with high moisture content has generally been discarded, which has led to economic loss and socio-environmental problems. The effects of solid state fermentation using *Kluyveromyces marxianus* on the nutritional components, beany odor and processing properties of soybean residue were studied. The results showed that *K. marxianus* fermented soybean residue (FSR) had an increase in crude fat (24.5%), soluble dietary fibers (158%) and polysaccharides (262%), while phytic acid (61.7%) and the activity of a trypsin inhibitor (92.7%) decreased. A significant reduction in the beany odor was also observed. FSR showed higher water absorption and better emulsifying properties. Overall, the study indicated that fermentation with *K. marxianus* resulted in improved nutritional values and processing characteristics of the soybean residue. **(Author's abstract)**

Keywords: Okara, *Kluyveromyces marxianus*, Beany odor, Fermentation, Food science and technology

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0404

Ultrasound-assisted aqueous two-phase extraction of resveratrol from the enzymatic hydrolysates of *Polygonum cuspidatum*

Zhou, Linfang , Jiang, Bo , Zhang, Tao , Li, Shuhua

An efficient ultrasound-assisted aqueous two-phase extraction (UAATPE) and enrichment process for resveratrol from the enzymatic hydrolysates of *Polygonum cuspidatum* using an ethanol/ammonium sulfate system was developed. After enzymatic hydrolysis using polydatin- β -glucosidase (PBG) which was a wild extracellular enzyme, 99.7% of polydatin was converted to resveratrol. The maximum yield of resveratrol was 10.7 mg/g and the corresponding recovery rate was 99.1% at 21% (w/w) ethanol/22% (w/w) (NH₄)₂SO₄. The extraction yield of resveratrol in UAATPE was increased by 43.6 and 79.4% compared with ultrasound-assisted extraction and solvent extraction with stirring, respectively. Meanwhile, the total sugars in UAATPE were only 46.8% of ultrasound-assisted extraction and 56.0% of solvent extraction with stirring. The process of UAATPE is a promising technique for extraction and enrichment of bioactive components. **(Author's abstract)**

Keywords: *Polygonum cuspidatum*, Hu zhang, Resveratrol, Polydatin, Polydatin- β -glucosidase, Food science and technology

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0405

Vine (*Vitis vinifera* L.) leaves as a functional ingredient in pistachio calisson formulations

Jridi, Mourad , Abdelhedi, Ola , Kchaou, Hela , Msaddak, Lotfi , Nasri, Moncef , Zouari, Nacim , Fakhfakh, Nahed

Vine (*Vitis vinifera* L.) leaves powder (VLP) was characterized in terms of functional and chemical properties and used as an ingredient in a pistachio calisson formulation. The total phenolics and flavonoids contents, phenolic compounds profile as well as techno-functional characteristics of the VLP were measured. The sensory properties, color, mass loss and lipid oxidative stability of calissons enriched with VLP were also determined. VLP contained a high amount of insoluble dietary fibers, improving its fat and water absorption capacities. Liquid chromatography analysis of VLP extracts allowed the identification of 7 flavonoids and 5 phenolic acids.

Quercetrin (quercetin-3-O-rhamonoside) was the major compound (875 $\mu\text{g/g}$ extract) followed by rutin (quercetin-3-O-rutinoside) (384 $\mu\text{g/g}$ extract). VLP was incorporated at two substitution levels (3 and 5%) in the pistachio calisson formulation. Results showed that calisson enrichment with VLP did not alter the sensory attributes. Interestingly, VLP addition also resulted in the reduction of mass loss and oxidative degradation of the pastry product during storage. The study suggested that VLP incorporation in a pistachio calisson formulation not only added nutraceutical value, but also improved its quality. **(Author's abstract)**

Keywords: *Vitis vinifera, Grape leaves, Phenolic compounds, Pistachio calisson, Food science and technology*

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0406

Whey protein stabilized nanoemulsion: A potential delivery system for ginsenoside Rg3 whey protein stabilized nanoemulsion: Potential Rg3 delivery system

Hou, Pingping , Pu, Fengling , Zou, Haoyang , Diao, Mengxue , Zhao, Changhui , Xi, Chunyu , Zhang, Tiehua

In the current research, we systematically investigated the physicochemical stability of the nanoemulsions that were formulated with 90% (v/v) whey protein isolate (WPI) aqueous phase and 10% (v/v) medium chain triglyceride oil phase at neutral pH using high intensity ultrasonication. We measured the physicochemical properties of nanoemulsions stabilized by WPI at different concentrations, including particle size, zeta potential, turbidity, centrifugal stability, and rheological behavior. Besides, we also evaluated the influence of processing conditions (ionic strength, freeze-thaw cycle and thermal treatment) on the nanoemulsion stability. The particle size of WPI nanoemulsions increased by approximately 5% at 25 $^{\circ}\text{C}$ and 8% at 37 $^{\circ}\text{C}$ after 7 weeks' storage, while the particle size and zeta potential of the nanoemulsions at 4 $^{\circ}\text{C}$ were changed. The 1% WPI stabilized nanoemulsion was very sensitive to Na^+ (0.1–0.5 $\mu\text{mol/l}$) and freeze-thaw treatment (3 cycles) with significant increase in particle size and decrease in the absolute value of zeta potential. The turbidity of nanoemulsions decreased by over 50% after freeze-thaw cycles, especially the 1% WPI stabilized nanoemulsion. All samples were still stable under thermal conditions. Among them, the 5% WPI stabilized nanoemulsion showed the best ionic, freeze-thaw, and thermal stability. All tested nanoemulsions showed typical shear-thinning behavior, and the infinite shear viscosity of 5% WPI stabilized nanoemulsions was highest. In conclusion, the 5% WPI stabilized nanoemulsion has the best physicochemical stability under different processing conditions during storage, which has high potential in use as a delivery system for bioactive substances like ginsenoside Rg3 in food technology. **(Author's abstract)**

Keywords: *Whey protein, Nanoemulsion, Stability, Delivery system, Ginsenoside Rg3, Food science and technology*

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(Filipiniana Analytics)
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0407

Zinc Status of Filipinos by Serum Zinc Level

Marcos, Juanita M. , Perlas, Leah A. , Trio, Phoebe Z. , Ulanday, Joselita Rosario C. , Cheong, Revelita L. , Desnacido, Josefina A. , Capanzana, Mario V.

Background: Zinc deficiency has been considered an important and widespread risk to human health, ranking 5th among the 10 leading causes of illness and disease in developing countries. To date, zinc status data using serum zinc at national level are still very limited, so global prevalence remains unknown. Objective: This paper aimed to determine serum zinc levels and magnitude of deficiency among all Filipino age/physiologic groups in the 2008 National Nutrition Survey. Methods: Utilizing a multi-stage stratified sampling design, zinc status was assessed using serum zinc levels determined by atomic absorption spectrometry. Prevalence and magnitude of zinc deficiency was evaluated using the suggested lower cut-offs and guidelines for public health concern of the International Zinc and Nutrition Consultative Group, respectively. Results: The national estimate of zinc deficiency in the Philippines was 30.0%, with a mean serum zinc level of $84.0 \pm 0.5 \mu\text{g/dL}$. Prevalence of zinc deficiency in all Filipino age and physiologic groups was considered of high magnitude ($>20\%$). The highest prevalence was noted among lactating women (39.7%), the extent peaking among those in their 1st 6 months of lactation (45.6%). Males predominantly presented higher deficiency rates than females, except in adults, 20 – 29 and 30 – 39 y-old groups. Among males, older persons ≥ 70 y-old exhibited highest rate (39.5%). Conclusions: Zinc deficiency in the Philippines is of significant public health concern, both at the national level and in different age/physiologic groups. Lactating women is the most at-risk group to zinc deficiency and males are generally more vulnerable than females. (Author's abstract)

Keywords: *IZiNCG, Serum zinc, Zinc deficiency, Zinc status, Food science and technology*

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GENETICS

0408

Diversity and agro-morphological characteristics of Nigerian sesam (*Sesamum indicum* L.) cultivars using random amplified polymorphic DNA markers *, , , , , Nwalo Nweke, Friday ,*

Sixty sesame accessions from eight locations in Nigeria were assessed for agro-morphological traits using random amplified polymorphic DNA (RAPD) markers. DNA was isolated using modified cetyltrimethyl ammonium bromide extraction method. The cultivars were assessed for genetic diversity using eight random amplified polymorphic DNA markers. The agronomic assessment was also conducted and the results showed that germination period ranged 3-7 d. Mean 100-seed weight was 3.6 ± 0.3 mg, while mean seed pod was 56 pods per plant, with days to flowering ranging 48-62 d. Seeds size ranged 50.6-79.3 mm, while plant height was 1.4 ± 1.7 m. Dendrogram generated using unweighted pair groups mean arithmetic analysis separated the accessions into six major groups of two clusters and some independent cultivars with a bootstrap value of 45-60%. The polymorphic information content (PIC) values ranged from 0.3-0.9. The RAPD marker OPT-10 showed polymorphic characteristics, while OPB-11 was monomorphic with least PIC value. Results of PCR amplifications indicated high level of genetic diversity among the accessions and farmers can select varieties for breeding purposes based on agro-morphological traits.

Keywords: *agro-morphological, RAPD markers, sesame cultivars, genetic diversity, plant breeding, Sesamum indicum, Genetics*

Philippine Journal of Crop Science, Volume No. 45 Issue No. 1,
2020,
(Filipiniana Analytics)

Assessment of Native Flora Species in Relation to Soil Profile on Mount Kasunogan*Balt, Ben Rashid A.*

Biodiversity is the basis of the state of an ecosystem and our entire planet. This study aims to assess the soil profile's effects on the native flora species on mount Kasunogan. The research was conducted on the west ridge of mount Kasunogan in Barangay Aclan, Nasipit, Agusan del Norte. Flora species of shrubby trees were assessed along with the soil profile on the area. The researchers established three quadrants where leaf and soil samples were taken for assessment. The botanical expedition on mount Kasunogan recorded 37 native flora species. The Malatambis was present on all quadrants, while other species occurred only in one or two quadrants. These flora species have characteristics that allowed them to thrive on the mountain. The soil was determined acidic, and nutrients like potassium, phosphorus, and organic matter mostly ranged from low to moderately low. Planting Falcata, Narra, and Agoho should be considered since these species can withstand intense exposure to sunlight and acidic soil. However, exotic plant plantations must be well studied because there were no exotic plants around in the area.

Keywords: *assessment, Community-based Environment and Natural Resources Office-Nasipit (CENRO), flora, Mount Kasunogan, native flora species, quadrant, soil profile, Philippines, Geology*

SMCC Interdisciplinary Journal, Volume No. 1 Issue No. 1,
2020,
(Filipiniana Analytics)

The Australian experience and a view of the changes from wanton destruction and can't care less to be best practice in mine restoration*Doronila, Augustine I.*

The mining industry in Australia as in most of the highly industrialized nations endowed with abundant mineral resources has created a major legacy of land degradation. This has been due to the removal of the previously functional vegetation communities and creating unstable and barren waste materials which also produced heavy metal pollution. Attitudes and practices have evolved and moved on and the industry has recognized the need to formulate various prescriptions, with the overall objective of mine closure to prevent or minimize adverse long-term environmental (physical, social and economic) impacts, and to create a stable landform suitable for some agreed subsequent land use. Mine site rehabilitation is defined as the return of a disturbed site to a form and productivity level that conforms to a defined end land use that may not be necessarily the original use.

I will describe a landmark mine closure program to reclaim a highly polluting mining operation and present examples of our work which reflect the changes in mining environmental operations in Australia. In my opinion, because we, as educational institutions in Australia, have produced this large pool of competent students who are aware of environmental stewardship, the educational outputs e.g., skilled students, has also allowed the mining industry to significantly improve its performance. This would be a worthwhile scenario to consider in the Philippine context. In realistic terms, government funding agencies as well as current mining operations must be encouraged to contribute to the upskilling of college and university students by supporting research projects through provision of logistic support to undertake these experiments. We have effectively showed that empirical data generated from these projects are important. Experiments carried out by students under the guidance of competent plant and soil scientists simply provide good evidence of what can and cannot grow on mine wastes. Implementing academic programs of this kind in the Philippines can generate very

useful information for the whole industry within a very short span of time (2-3 years) which would allow progressive mine restoration to be undertaken.

Keywords: *mine restoration, bioremediation, mine site rehabilitation, pollution, environmental concern, Geology*

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2012,
(Filipiniana Analytics)

HEALTH AND WELLNESS

0411

Classical music: A therapy for reducing stress during latent phase of labor among primigravida women

Patindol, Guia Murrie S. , Macadangdang, Lester John B. , Galdo, Mary Louizel R. , Leguin, Bismark L. , Danis, Mary Grace M. , Dellosa, Mary Jane L. , Gaspar, Charity Le

This study tests the effectiveness of music therapy in decreasing stress levels experienced by primigravida women during the latent phase of labor. This study was conducted at Family Care and Maternity Clinic in New Pandan Street, Panabo City. Twenty-three primigravida women served as volunteer respondents. Data was gathered through a validated survey questionnaire that uses the Likert Scale. T-test statistical analysis was conducted to measure if there was a significant difference on the stress levels of primigravida women before and after receiving music therapy. Results showed that physical, psychological and socio-cultural factors have the greatest effect on the stress levels among primigravida women. Results proved that classical music is an effective counter for the anxiety of women ongoing labor. Statistical analysis results showed the calculated t , 2.75, to be higher than tabular t , 2.15, hence there is a significant difference on the level of stress among women in the stage of labor and delivery before and after receiving music therapy. These results illustrated that exposure to music was a good mechanism in coping up with nervousness and stress among the surveyed primigravida women. **(Author's abstract)**

Keywords: *Music therapy, Stress, Primigravida women, Latent phase of labor, Philippines, Health and wellness*

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2013,
(Filipiniana Analytics)
NP

HYDROLOGY

0412

Strategies for Managing Household Water Demand in Carcar City, Cebu, Philippines *Bargayo, Serge J*

This study aims to analyze water demand among households in Carcar City, an urban city in southern Cebu that experienced an unparalleled population and economic growth after its cityhood in 2007. This situation put pressure on the Carcar Water District (CWD), the major water provider in the city, to expand its service capacity. Policy implications for water demand management are drawn from the findings of this study. Hard and soft mechanisms that can be jointly undertaken by the water district and the local government unit are recommended to better manage water demand in Carcar City.

Keywords: household water, water demand, water demand management , Carcar City, Cebu, governance, Hydrology

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2018,
(Filipiniana Analytics)

INDUSTRY

0413

Survival Analysis of Export Relationships of Philippine MSMEs

Bautista, Mark Edi

This study examines the survivability of Philippine micro, small, and medium enterprises' (MSMEs) exports to select countries within the frameworks of the Asia-Pacific Economic Cooperation Boracay Action Agenda to Globalize MSMEs and the Association of Southeast Asian Nations Strategic Action Plan for SME Development. It documents the survival rate and duration of Philippine exported goods and shows that most export relationships of the Philippines are brief. It also finds that MSMEs, on average, account for a more significant number of the Philippines' export relations than large establishments.

Keywords: MSMEs, export, micro, small, and medium enterprises, survival analysis, Asia-Pacific Economic Cooperation Boracay Action Agenda to Globalize MSMEs, Association of Southeast Asian Nations Strategic Action Plan for SME Development, Industry, trade and industry

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2018,
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INFORMATION AND COMMUNICATIONS TECHNOLOGY

0414

Computerized Medical Record and Monitoring System of Saint Michael College of Caraga, Philippines

Bergado, Trisha

Life in the digital age raises the need for computerized medical records. This study was conducted to determine the advantages that the system brings to the school clinic and ease managing the students' medical records and personnel of Saint Michael College of Caraga (SMCC). The current CPD framework, while superior to paper in general, frequently doesn't address the client's issues halfway because they depend on an obsolete paper-outline' worldview (Gad & Ramadan, 2013). The study revealed that the system was necessary for managing the medical records and that it is very beneficial for the school. In addition, this system stores files with security and adds information to both students and personnel, including their consultation with the clinic. Moreover, the system updates the information whenever there are changes in the patient - fast-tracking data that can be convenient for the clinic attendant. The system also prints three classes of reports that are easy to manipulate. It was

recommended that applying the system to the school clinic to boost the performance in managing the medical records, and improve the security standards, maintain privacy and confidentiality of patient data.

Keywords: *system, computerized, electronic, health, medical record, monitoring, Philippines, Information and Communications Technology*

SMCC Interdisciplinary Journal, Volume No. 1 Issue No. 1,
2020,
(Filipiniana Analytics)

0415

COVID-19-related cybercrimes issues and threats

Fontanilla, Mari

With the reported rising cases of COVID-19 and the home quarantine being implemented, the internet became the channel for effective human interaction. Doing most of the work online brought an increasing number of online fraudsters exploiting the public fear using the pandemic to attack people by committing cybercrime to their advantage. This paper introduced what cybersecurity is all about. Using the available data and literatures on pandemics-related concerns, this paper listed some of the cybersecurity issues that are being faced at this time. Further, it discussed forms of attacks being encountered and gave recommendations on how to be safe online.

Keywords: *COVID-19, cybercrime, issues, threats, online platform, fraud, cybersecurity, Information and Communications Technology*

International Journal on Social Innovation & Research, Volume No. 11 Issue No. 1,
2020,
(Filipiniana Analytics)

0416

Cyberlearning: the learning management system and the influence of its usage on student engagement

Mandap, Ma

With the integration of the Internet into the teaching system, education today has rapidly evolved into cyber learning. Consequently, several educational institutions have adopted learning management systems (LMS), a comprehensive digital platform, to facilitate online instruction. The present study seeks to measure extent of the influence of LMS usage on student engagement.

Keywords: *digital platform, learning management systems, student engagement, e-learning, cyberlearning, Information and Communications Technology*

Enderun Colleges Scholarly Review, Volume No. 3 Issue No. 2,
2020,
(Filipiniana Analytics)

Role of information and communication technology during the COVID-19 pandemic

Alfaro, Den

Information and Communication Technology plays an important role in the industries, like healthcare, finance, manufacturing, education, forecasting and business, when it comes to developing a sustainable and strong infrastructure. The COVID-19 outbreak brings about the imposition of an enhanced community quarantine in different countries, especially in places where the number of Covid-19 cases is high. This paper explores the different ICT technologies used and that can be used for data gathering, data analyzing, data management, and data communications during the outbreak. It also looks into how the technologies work and how they provide support to people in this time of need. Moreover, it focuses on Big data and how information can be used.

Keywords: *COVID-19, data gathering, data analyzing, data management, data communications, pandemic, Information and Communications Technology*

International Journal on Social Innovation & Research, Volume No. 11 Issue No. 1,
2020,
(Filipiniana Analytics)

LIBRARY AND INFORMATION SCIENCE

From cholera to COVID-19: a historical review of misinformation during pandemics

Acevedo, Christian Geo

The role of health literacy has never been more crucial, particularly at the height of a pandemic and annals in history are good reminders. The case of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) presents us a huge bulk of information to fight the spread of the virus, like staying at home, disinfection, hand washing, and maintaining physical distance (World Health Organization, 2020). Interestingly, this information is not new. At the turn of the 20th century, the Philippines was hit by two of the worst pandemics in history: the Asiatic cholera and the Spanish flu. Cases spread like wildfire and not a town in the archipelago was spared from disease and death. Health outbreaks spread easily in those days and were caused by poor health decisions, such as poor hygiene and misinformation. The American colonial government introduced health measures to prevent future health outbreaks and fight infodemic that deterred health reforms, especially in the grassroots. These lessons from the past remind us of the vital role of healthy literacy in saving lives.

Keywords: *information dissemination, misinformation, communications, health emergency, cholera, pandemic, health literacy, Library and information science*

Progressio Journal on Human Development, Volume No. 14 Issue No. 1,
2020,
(Filipiniana Analytics)

Clinical librarian service in the Philippines: experience in a critical care setting of a tertiary hospital
Santos, Mark Anth

Considered as the earliest form of embedded librarianship, a clinical librarian service/program involves the provision of information directly at the point of care. Being at the place where patient care is being delivered, the clinical librarian can provide specialized and timely information to health care professionals. Numerous studies on the potential, benefits, and effectiveness of clinical librarianship have been published. However, its practice and implementation in most hospitals around the world, especially in the Philippines, is not yet prevalent. This case study describes the experiences of a clinical librarian in a critical care unit of a private tertiary hospital in Quezon City from 2013 up to 2018. Roles and activities performed by the clinical librarian in the neurocritical care unit are presented. Recommendations on establishing a clinical librarian service, particularly in the Philippines, are discussed.

Keywords: *clinical librarianship, embedded librarianship, clinical librarian service, informationist, tertiary hospital, Philippines, Library and information science*

Journal of Philippine Librarianship, Volume No. Issue No. ,
2018,
(Filipiniana Analytics)

Community readiness assessment for a community-based collecting and archiving project for contemporary komiks
Boquiren, Alain And

This study assessed the willingness and readiness of the local komiks community in the National Capital Region to collaborate in a community-based archiving initiative. The author also identified concerns of this community regarding the preservation of their works, namely: the protection of their rights as content creators, the protection of their works from piracy, and the sustainability of the preservation effort. A project plan based on the findings was developed to help komiks community members and archive practitioners collaborate on a collecting and archiving project, which can be used as a starting point for a komiks preservation practice.

Keywords: *archiving, collecting project, comic books, community-based, komiks, Library and Information Studies, Philippine comics, preservation, National Capital Region, Library and information science*

Journal of Philippine Librarianship, Volume No. Issue No. ,
2018,
(Filipiniana Analytics)

**Marist School integrated information literacy program (MASINFORM Program):
integration of information literacy skills and library lessons in a school's curriculum**
Evangelista-Abrigo, Dia

The paper aims to design an integrated information literacy program and to assess its effect on the information literacy skills of Marist School Grade 1-6 pupils. The research design of this study employed a mixed method approach, descriptive for the development phase and quasi-experiment for the assessment stage. The study found out that an essential factor in designing an integrated information literacy program is the strong collaboration of teachers and librarians. It also revealed that Grade 1-6 pupils information literacy skills improved after attending sessions on information literacy.

Keywords: *information literacy skills, school library, integrated information literacy program, descriptive experiment, quasi-experiment, grade school pupils, Library and information science*

Journal of Philippine Librarianship, Volume No. Issue No. ,
2021,
(Filipiniana Analytics)

MARINE SCIENCE

**Determination of Optimal Sizes of Marine Protected Areas in the Visayas, Philippines
through Biological-Social Welfare Optimization**
Ontoy, Dexter S. , Padua, Robe

Two optimizations models are explored: one that maximizes a social welfare – function subject to biological diversity and management constraints, which maximizes biodiversity subject to management resource constraints and social welfare considerations are proposed to determine sizes of Marine Protected Areas (MPA). The models are applied to the marine protected areas in the Visayas, Philippines using available records in the Directory of Marine Protected Areas in the Visayas by fitting the species-area relation (SAR) curve, the management resource–area curve (MRA), and the welfare–area (WA) curve from each of the marine protected areas listed. A comparison of the optimal MPA sizes computed from the model and the prevailing MPA sizes in the Visayas area revealed that non–functional MPA shave sizes which do not support either the management resource, biodiversity requirement or social–welfare considerations. **(Author's abstract)**

Keywords: *Marine protected area, Sizes, Species-area trade-off, Social welfare economics, Marine science*

CNU Journal of Higher Education, Volume No. 5 Issue No. 1, 163-174
2011,
(Filipiniana Analytics)
NP

**Some Applications of the Distribution of the Maximum on Independent Normal
Random Variables**
Padua, Robe

The paper deals with the distribution of the maximum of n independent normal random variables and some of its applications in the electricity power industry in the area of peak load estimation and in genetic selection for animal breeding. For small n , the difficulty in finding the value of multiple integrals involved in the distribution function of the maximum order statistics (and hence, in the computation of its expected value) is recognized. The paper provides for simple approximations to the mean of the largest order statistics both in the iid and non-identically distributed cases. Large sample asymptotic results for extreme values of normal random variables are often used in reliability theory and of late, used in the analysis of extreme weather changes in relation to climate change. While the large sample results for the iid case have been treated in the past, we focused on the relatively unexplored non-identical but independent case. Results show that : (a) the simple approximations to the mean of the largest order statistic both for the iid and non-iid cases have good MSE properties, and (b) the large sample distribution for a non-identically distributed case still obeys the Type I Gumbel distribution with shifted parameters. **(Author's abstract)**

Keywords: *Largest order statistic, Multivariate normal, Error function, Peak load, Genetic selection, Rayleigh Distribution, Gumbel Distribution, Mathematics*

CNU Journal of Higher Education, Volume No. 5 Issue No. 1, 27-42
2011,
(Filipiniana Analytics)
NP

Approximate Controllability of a Parabolic System with Imperfect Interfaces
Donato, Patrizia , Jose, Editha C.

In this paper, the investigation of the asymptotic behavior of the approximate control for a parabolic equation with periodic rapidly oscillating coefficients depending on a parameter γ and modeling composites with interfacial resistance was completed. The approximate control and its asymptotic behavior as $\varepsilon \rightarrow 0$ for the case $-1 < \gamma \leq 1$ was done recently in Donato & Jose (2015). The remaining case $\gamma \leq -1$ was considered. The corrector results for the latter case given in Yang (2014) play an important role when proving this result. Following an idea introduced by Lions (1991), the approximate control is constructed as the solutions of a related transposed problem having as final data the (unique) minimum point of a suitable functional. It was then demonstrated that the control and the corresponding solution of the periodic problem converge respectively to the control and to the solution of the homogenized problem. One of the main difficulties in this study was to find the appropriate limit functionals in order to obtain the convergence results. This study addressed the problem of homogenization in the context of controllability and vice-versa, showing the interplay of two approaches in the study of partial differential equations. **(Author's abstract)**

Keywords: *Approximate controllability, Homogenization, Interface, Jump condition, Parabolic equation, Periodic interface, Mathematics*

Philippine Journal of Science, Volume No. 144 Issue No. 2, 187-196
2015 December,
(Filipiniana Analytics)
Fil (S) Q1 P55 144/2 2015

White Noise Path Integral Evaluation of the Characteristic Function of a Modified Wormlike Chain

Casas, Karl Patrick S., Bornaes, Jinky

The characteristic function of a wormlike chain is expressed as a Feynman path integral, obtained via the white noise functional approach. In order to describe the model statistically, the following physical assumptions are considered: (i) the wormlike chain curve is analogous to a trajectory of a quantum particle, and (ii) the total contour length L of the Wormlike chain is regarded as “time” t . The mathematical treatment is then facilitated by modifying its “Lagrangian”, given by Fixman and Kovac, wherein the resulting expression of the “Lagrangian” is just similar to the harmonic oscillator in an external electric field. Then, the cosine of the angle between the field vector and the tangent vector is approximated. In order to evaluate the characteristic function in one dimension only, we let this angle be linearly dependent on the contour distance of the chain. The characteristic function is then evaluated via white noise analysis. The result, with the field set to zero, is then compared to the propagator of a harmonic oscillator in an inverse potential. **(Author's abstract)**

Keywords: *Wormlike chain, White noise analysis, Lagrangian, Harmonic, Mathematics*

CNU Journal of Higher Education, Volume No. 5 Issue No. 1, 19-26
2011,
(Filipiniana Analytics)
NP

MEDICINE

5-Aminolevulinic Acid: Pitfalls of Fluorescence-guided Resection for Malignant Gliomas and Application for Malignant Glioma Therapy

Yamamoto, Junkoh, Kitagawa, Takehiro, Miyaoka, Ryo, Suzuki, Kohei, Takamatsu, Seishiro, Saito, Takeshi

5-Aminolevulinic acid (ALA) has been widely used as an intravital fluorescence marker in the fluorescence-guided resection of malignant gliomas. Although not a photosensitizer itself, 5-ALA is a prodrug that accumulates protoporphyrin IX (PpIX) in the mitochondria of glioma cells; PpIX acts as a photosensitizer. Fluorescence-guided resection for malignant gliomas has some pitfalls. Moreover, 5-ALA is not merely a fluorescence marker but has potential as a mitochondria-targeting drug for malignant glioma therapy. In this article, we review the literature related to 5-ALA, discuss the pitfalls of fluorescence-guided resection using 5-ALA for malignant gliomas, and describe the application of 5-ALA for malignant glioma therapy with personal opinions. **(Author's abstract)**

Keywords: *5-aminolevulinic acid, Glioma, Mitochondria-targeting drug, Reactive oxygen species, Radiosensitizer, Medicine*

Journal of UOEH, Volume No. 42 Issue No. 1, 27-34
2020 March,
(Filipiniana Analytics)
F(S) RC967 J82 42/1 2020

Accuracy of endometrial 2D ultrasound and power doppler in predicting endometrial pathology among patients with endometrial disease at Dr. Jose Fabella Memorial Hospital

Coloma, Leilani C. , Olalia, Madely

Background: Transvaginal sonography with Doppler study has helped improve the clinician's ability to diagnose and manage intrauterine abnormalities. Use of International Endometrial Tumor Analysis (IETA) may help predict the risk of endometrial pathologies based on ultrasound appearance.

Objective: To determine the accuracy of 2D ultrasound and power Doppler in the examination of the endometrium using the international endometrial tumor analysis classification in predicting intrauterine disease among patients with endometrial pathology in Dr. Jose Fabella Memorial Hospital.

Study Design: A cross-sectional study was done on patients who were diagnosed with abnormal uterine bleeding and underwent 2D ultrasound and power Doppler studies. Sonographic features were classified using International Endometrial Tumor Analysis group classification and correlated with the histopathologic diagnosis.

Results: Seventy-three patients were included in the study. The age of the subjects was significantly associated with the the histopathologic findings of benignity or malignancy. At 40-49 years old, there was significantly higher proportion of subjects with benign lesions, and 60 years and above had predominance of malignancy. The top three histopathologic diagnoses: endometrial polyp 41 cases (46.2%), proliferative endometrium 9 cases (12.3%), and simple hyperplasia without atypia 8 cases (11.0%). Patients diagnosed with malignancy had significantly thickened endometrium at 2.9 cm. The color content of the endometrium (color score) were statistically significant among different pathologies. Positive predictive value is the same for both, while Doppler showed a higher negative predictive value. Total accuracy was higher for Doppler.

Conclusion: Both greyscale ultrasound and Doppler are 100% accurate in predicting benign lesions but Doppler has a higher accuracy in predicting malignant lesions. The IETA group consensus on descriptive and morphologic nomenclature in describing endometrial findings for power Doppler and on greyscale ultrasound is clinically valuable. **(Author's abstract)**

Keywords: *Ultrasound, Power Doppler, Terminology, Endometrium, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 4, 1-8
2017 July to August,
(Filipiniana Analytics)
NP

Accuracy of two dimensional ultrasonography in detecting lymph node metastasis in cases of uterine and cervical malignancies seen in a tertiary hospita: A five year restropective study

Reforma, Kareen N. , dela Llana, Kathlynn

Objective: This study aims to determine the accuracy of two dimensional ultrasound in detecting lymph node metastasis in uterine and cervical (stage IA2-IIA) malignancies.

Materials and Methods: This is a five-year retrospective, cross sectional study conducted for 6 months among uterine and cervical malignancy patients who underwent bilateral pelvic lymph node dissection and para-aortic lymph node sampling with ultrasound performed within two months prior to surgery in a tertiary hospital. Ultrasound findings were compared with histopathologic results as gold standard.

Results: The study included 319 patients, 267 uterine and 52 cervical malignancies. Uterine cancer (pelvic-7.1% and para-aortic-2.6%) and cervical cancer (pelvic-1.95%) nodal involvement showed majority having round

shape. Mean pelvic nodal size was 1.75 x 0.93cm-uterine, 1.83 x 0.93cm-cervical and para-aortic 3.3x2.0cm-uterine. The study revealed accuracy, sensitivity, specificity, PPV and NPV of 91.5%, 29.4%, 96.4%, 25.0% and 96.0% respectively for pelvic node metastasis and 95.6%, 11.1%, 98.1%, 14.3% and 97.4% respectively for para-aortic involvement. Ultrasound accuracy in detecting pelvic node extension was 98.1%-cervical and 90.3%-uterine (sensitivity-50% vs 26.7%; specificity-100% vs 94.1%; PPV-100% vs 21.1% and NPV-100% vs 95.6%). Para-aortic nodal metastasis detection among cervical and uterine cancer patients showed the following: accuracy (98.1% vs 95.1%), specificity (100% vs 97.7%), and NPV (98.1% vs 97.3%).

Conclusion: Two-dimensional ultrasound is reliable in ruling in the presence of pelvic and para-aortic lymph node metastasis among patients with uterine and cervical malignancies. However, its low sensitivity of detection makes it less dependable in ruling out nodal involvement. Larger size and round shape of lymph nodes represent nodal metastasis. (**Author's abstract**)

Keywords: *Uterine malignancy, Cervical malignancy, Pelvic lymph nodes, Para-aortic lymph nodes, Nodal metastasis, Two-dimensional ultrasound, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 4, 18-28
2017 July to August,
(Filipiniana Analytics)
NP

0429

Acquired Platelet Dysfunction with Eosinophilia

Villanueva, Emilio III

The study is about six-year-old male that was brought in with 1-month history of recurrent spontaneous bruising which resolves without intervention. There was no history of trauma, other bleeding episodes, medication intake, nor recent viral infection. Birth, past medical, and family histories were unremarkable. Pertinent physical examination showed multiple, non-tender ecchymosis of varying chronicity and sizes on his upper and lower extremities and abdomen. The rest of the examination was essentially normal. The patient was suspected of acquired platelet dysfunction with eosinophilia (APDE).

Keywords: *thrombocytes, thrombocytopathy, cell morphology, Medicine*

Philippine Journal of Pathology, Volume No. 5 Issue No. 1, 50-51
2020,
(Filipiniana Analytics)

0430

Alpha-Defensin-1 in Synovial Fluid is Useful for Diagnosis of Joint Infection

Tajima, Takafumi, Mori, Toshiharu, Hirano, Fumitaka, Sabanai, Ken, Kawasaki, Makoto, Yamanaka, Yoshiaki, Tsukamoto, Manabu, Sakai, Akinori

The distinction between bacterial infectious and noninfectious arthritis is typically challenging in the early stages; however, it is critical for treatment decision making. Here, we investigated the diagnostic relevance of alpha and beta-defensin levels in serum and synovial fluid as biomarkers of joint infection in patients presenting with fever and arthritis. The study included 12 patients who presented with fever ($\geq 37^{\circ}\text{C}$) and arthritis (pain in the knee or hip joint). The diagnostic criteria for periprosthetic joint infection proposed by the Musculoskeletal Infection Society were used to detect joint infection and categorize the patients into infection and non-infection groups. Alpha-defensin-1 and beta-defensin-3 levels in serum and synovial fluid were measured using enzyme-linked

immunosorbent assay. No significant between-group difference was observed with respect to serum alpha-defensin-1 levels; however, synovial fluid alpha-defensin-1 levels were significantly higher in the infection group (33.6 ± 26.2 ng/ml) than in the non-infection group (0.9 ± 0.4 ng/ml). No significant between-group differences were observed with respect to serum or synovial fluid beta-defensin-3 levels. Furthermore, synovial fluid alpha-defensin-1 levels were increased in patients without prosthesis in the infection group. In conclusion, in patients with fever and arthritis, synovial fluid alpha-defensin-1 levels were significantly higher in patients with infectious arthritis than in those with noninfectious arthritis. Therefore, synovial fluid alpha-defensin-1 levels is a useful diagnostic marker for joint infection. **(Author's abstract)**

Keywords: *Diagnosis of joint infection, Alpha-defensin, Beta-defensin, Medicine*

Journal of UOEH, Volume No. 42 Issue No. 2, 167-173
2020 June,
(Filipiniana Analytics)
F(S) RC967 J82 42/2 2020

0431

Androgen insensitivity syndrome (AIS)

Alensuela, Anna Belen I., Iskandar,

Androgen Insensitivity Syndrome (AIS) is a rare condition, it is an X-linked-mutation that is considered as a disease caused by resistance of androgen receptor to its actions. It is expressed in a variety of phenotypes ranging from male infertility to completely normal female external genitalia. This is a case of a 25 year-old with Complete Androgen Insensitivity Syndrome (CAIS), presented as phenotypical female with secondary sexual development, bilateral inguinal masses. Gonadectomy, estrogen replacement therapy and psychological support are part of long term management. **(Author's abstract)**

Keywords: *Androgen insensitivity syndrome, Complete androgen insensitivity syndrome, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 40 Issue No. 2, 38-46
2016 June,
(Filipiniana Analytics)
NP

0432

Anti-angiogenic property of turmeric plant (*Curcuma longa* Linn) in the duck embryo

Resgonia, Kriska Jaye I., Mabalot, Ruth Louise Y., Gresones, Maverick John F., Galay, Liesel Melody R., Berdigar, Elsie M., Aya-ay, Ador

Angiogenesis is the formation of new blood vessels which involves the migration, growth, and differentiation of endothelial cells and is controlled by chemical signals in the body. It plays a critical role in the anti-angiogenic property of turmeric leaf and rhizome extract. It utilized an experimental-control group which used Simvastatin, a known angiogenic inhibitor as the positive control and distilled water as the negative control. The study utilized chorioallantoic membrane assay employing the use of freshly laid duck eggs pre-incubated for 24 hours. Different concentrations of turmeric leaf and rhizome extracts were dispensed to the chorioallantoic membrane. The eggs were incubated for 7 days. After the incubation period, the eggs were cracked open and the embryos were placed in the petri dish. The major blood vessels were counted and the embryo structures were noted. Results showed that the turmeric leaf and rhizome extract exhibited anti-angiogenesis which is comparable to the positive control ($p > .05$) for both the turmeric leaf and rhizome extracts. **(Author's abstract)**

Keywords: *Angiogenesis, Angiogenesis inhibitor, Curcuma longa Linn, Endothelial cells, Cancer, Chorioallantoic membrane assays, One Way ANOVA, Philippines, Medicine*

Optima, Volume No. 2 Issue No. 1, 86-87
2015,
(Filipiniana Analytics)
NP

0433

Arteriovenous malformation: A review of four cases

Gorgonio, Nephtali M. , Dominguez, Anna Elo

In summary, we presented 4 cases of uterine arteriovenous malformation, all presenting with heavy, refractory bleeding. These cases were diagnosed using gray scale and color Doppler studies, as well as CT angiography. Treatment differed based on specific clinical findings, patient status, and desire for fertility preservation. And although more advanced interventions have been discovered, surgical management like a hysterectomy may still be performed when other options are unavailable or not feasible. Diagnostic modalities and treatments employed should be individualized to every patient's needs.

In a patient presenting with unexplained, intermittent vaginal bleeding, especially with a history of previous operations, or curettages, it is worth considering uterine arteriovenous malformation as a probable cause. The lack of any hard set rules or algorithms, as well as the scarcity of information regarding and dealing with this condition, emphasizes the importance of documentation and dissemination of literature. A high index of suspicion is necessary to properly work up and identify or exclude this diagnosis. **(Author's summary)**

Keywords: *Uterine arteriovenous malformation, CT angiography. Treatment, Intermittent vaginal bleeding, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 3, 39-45
2017 May to June,
(Filipiniana Analytics)
NP

0434

Assessment of climacteric symptoms among Filipino women ages 40 years and above seen at a tertiary hospital in Metro Manila

Maceren-Medina, Catherine Irene L. , Calimbas, Krys

Background: The common climacteric symptoms experienced by women 40 years and above can be classified into vasomotor, physical, psychological and sexual complaints. This may be associated with sociodemographic factors. The timing of menopause is also believed to be associated with sociodemographic factors.

Objectives: To determine the prevalence and associated factors of climacteric symptoms experienced by women ages 40 years and above seen at a Tertiary Hospital in Metro Manila.

Methods: By using Modified Menopause Rating Scale questionnaire (Rahman, et al.), 360 Filipino women aged 40 years and above were interviewed and were asked of their sociodemographic data and presence of climacteric symptoms (divided into somatic, psychological and urogenital domain).

Results: Majority of the participants had menopause at age 51, with mean age at menopause of 48.4 + 3.58 (SD) years. The most prevalent symptom reported was joint and muscular discomfort (65-75%) and this was more common among perimenopausal women. This was also the most common reason for absence at work of the

participants. There was no significant association found between sociodemographic factors and climacteric symptoms, as well as with the timing of menopause.

Conclusions: Unlike other studies in different countries, no significant association was found on this study between sociodemographic factor and climacteric symptoms. Sociodemographic factors also did not show any significant association with the timing of menopause. **(Author's Abstract)**

Keywords: *Climacteric, Menopause, Menopause rating scale, Menopausal symptoms, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 2, 13-25
2017 March to April,
(Filipiniana Analytics)
NP

0435

Association between anemia and intestinal parasitism among pregnant women (ages 15-44 years-old) attending antenatal clinic in a tertiary hospital

Reyes, Ida Magnolia Y. , Amado, An Ju

Background: Intestinal parasitic infections is one of the leading public health problem encountered more especially of the developing countries. Parasitic infections affect millions of pregnant women worldwide, and may directly or indirectly lead to a spectrum of adverse maternal and fetal effects, one of which is anemia that may result to detrimental fetal and maternal outcomes.

Objective: The objective of this study is to determine the prevalence of intestinal parasitism and anemia among pregnant women ages 15-44 years old consulting for antenatal check-up in a tertiary hospital.

Materials and Methods: Study population was based on inclusion criteria and was significance was statistically determined using odds ratio statistical analysis using SPSS software.

Results: The results of this study showed evidences of an alarming association between prevalence of soil-helminthiasis and anemia among Filipino pregnant women. These diseases have been a major global public health concern and up to date have been very difficult to address despite the efforts done by the local and international health organizations. Although this study is limited only in gathering sufficient data on the prevalence of anemia and intestinal parasitism, this may have provided future researches on possible benefits of deworming among pregnant women.

Conclusion: Health education and promotion truly have great impact in reducing the prevalence of the burden of these diseases. Therefore, antenatal care should be further emphasized in improving the maternal health in the country. **(Author's abstract)**

Keywords: *Anemia, Intestinal Parasitism, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 39 Issue No. 3, 1-6
2015 September,
(Filipiniana Analytics)
NP

0436

The association of histopathologic features and postmolar gestational trophoblastic neoplasia among patients with complete hydatidiform mole

Samonte, Kathleen Gizelle J., Soriano-Estrella, Agne

Objective: The study aims to correlate the histopathologic characteristics of patients diagnosed with complete hydatidiform moles with the risk of developing postmolar gestational trophoblastic neoplasia. **Methodology:** A retrospective review of 71 histopathologically-confirmed cases of complete hydatidiform moles was made. Group 1 consisted of 65 patients who achieved normal titers and remained to have normal β -hCG titers after at least 1 year of follow up. Group 2 included 6 patients who developed postmolar gestational trophoblastic neoplasia. Histopathologic slide review was done to assess the following: trophoblastic proliferation, nuclear atypia, hemorrhage, necrosis along with measurement of the shortest diameter of the largest hydropic villus. The association of the histopathologic features and the development of postmolar gestational trophoblastic neoplasia was done using chi square. Analysis of the association of histopathologic features included in the study predictive of the development of postmolar gestational trophoblastic neoplasia was done. **Results:** Analysis of several histopathologic parameters which may precisely identify which patients with complete hydatidiform moles were more likely to develop postmolar gestational trophoblastic neoplasia failed to produce statistically significant results. However, among the all the features studied, the presence of extensive necrosis favored the occurrence of postmolar sequela. **Conclusion:** Trophoblastic proliferation, nuclear atypia, hemorrhage and villus size of complete hydatidiform moles do not predict progression to postmolar disease. In spite of this, all patients with complete hydatidiform moles should be considered for prophylactic chemotherapy or should be monitored closely. **(Author's abstract)**

Keywords: Complete hydatidiform mole, Postmolar gestational trophoblastic disease, Histopathologic features, Villus size, Medicine

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 3, 17-21
2017 May to June,
(Filipiniana Analytics)
NP

0437

Association of HIV knowledge, testing attitudes and risk assessment with the acceptance rate of HIV counseling and testing among pregnant Filipino patients seen in a tertiary government hospital

Madamba, Helen V. , Cardenas-Hamoy, Lore

Background: HIV counseling and testing (HCT) should be routinely offered to all pregnant patients since HCT is considered as a gateway to the access of treatment and prevention of spread to non-infected individuals.

Objective: This study aims to determine the association of HIV knowledge, testing attitudes and risk assessment for HIV with the acceptance of HIV counseling and testing among pregnant patients seen at the antenatal clinic of a tertiary government hospital. **Methods:** A total of 293 respondents were included and asked to answer an investigator-guided self-administered questionnaire on HIV knowledge, testing attitudes, assessment of risk for HIV and acceptance of HIV counseling and testing. Results were analyzed using descriptive statistics and multiple logistic regression analysis.

Results: The respondents of this study were on average 28 years old, with a range of 15 to 44 years old, mostly Catholic and single, high school graduates who are currently unemployed. The respondents generally have low level of HIV knowledge, positive testing attitudes and assessed to be at low risk factors for HIV. The findings showed level of knowledge and condom use was not associated with acceptance of HIV counseling and testing.

Conclusion: Acceptance of HIV counseling and testing was significantly associated with positive testing attitudes, and low prevalence of risk factors such as, no history of multiple sex partners, no history of IV drug use, no history of imprisonment and no history of having sex in exchange for money or drugs. **(Author's abstract)**

Keywords: HIV knowledge, Testing attitudes, HIV counseling and testing, Pregnancy, Medicine

Philippine Journal of Obstetrics and Gynecology, Volume No. 39 Issue No. 4, 8-15
2015 December,

Association of intrapartal maternal blood glucose control and neonatal hypoglycemia in a private tertiary hospital

Gonzaga, Zarinah R. , De Leon, Maria Edward

Objective: Diabetes in pregnancy is associated with maternal and fetal risks that include maternal hyperglycemia and neonatal hypoglycemia. Intrapartal plasma glucose concentration has a stronger association with decreased neonatal hypoglycemia paralleled with antepartum plasma glucose levels. The objective of the study is to determine the association between intrapartal glucose monitoring and neonatal hypoglycemia.

Methods: This is a retrospective cohort study that involves parturients of any age with term gestation (>37 weeks) with gestational type or overt type of diabetes mellitus, either insulin-requiring or on medical nutrition therapy, with or without mean capillary blood glucose levels during labor. Multiple logistic regression was used for analysis, which quantifies the magnitude of association between maternal blood glucose control and neonatal hypoglycemia adjusted for significant confounders.

Results: The incidence of diabetes among pregnant in this private tertiary hospital over the study period was 7.82%. Most of the diabetic parturients were primigravid, with gestational type of diabetes mellitus, and on medical nutrition therapy. More than half were referred to an endocrinologist intrapartum. The incidence of maternal hyperglycemia intrapartum is 33%. The birthweights of the neonates ranged from 2095 to 5250 grams. Among the diabetic parturients, the incidence of neonatal hypoglycemia is 10%. There was no significant association between neonatal hypoglycemia and intrapartummaternal hyperglycemia ($p=0.05$).

Conclusion: There is no significant association between intrapartum maternal hyperglycemia and development of neonatal hypoglycemia. Antepartum and intrapartum management of maternal hyperglycemia did not appear to be associated with the development of neonatal hypoglycemia. A standardized institutional management protocol on glucose monitoring and control among diabetic parturients is strongly suggested. **(Author's abstract)**

Keywords: *Diabetes in pregnancy, Intrapartum blood glucose monitoring, Neonatal hypoglycemia, Medicine*

Awareness and practices on adult vaccination of obstetrician-gynecologists in the Philippines

Manalastas, Ricardo M. , Elauria, Jean Ail

Background: Adult vaccination is necessary in the prevention of many of the most common infectious diseases because immunity from infant vaccination typically wanes in adulthood. In the female population, the obstetrician-gynecologist is placed at the forefront of health promotion and disease prevention. In 2011, the Philippine Obstetrics and Gynecology Society (POGS) released a Clinical Practice Guideline on Immunization for Filipino Women but no study has been done to determine its impact.

Objective: This study determined the awareness and practices of OB-GYN specialists on adult vaccination and their perceived hindrances to routine administration of the recommended vaccines.

Methods: A self-administered questionnaire was given to the POGS fellows through email, phone and personal visits.

Results: Almost all of the respondents (95%) were aware of Clinical Practice Guideline on Immunization but only 4% of the OB-GYNs routinely administered all the vaccines. The most common vaccine administered was Human Papilloma Virus (HPV) vaccine (42.7%), followed by Influenza virus vaccine (28.1%), and Hepatitis B vaccine (27.3%). There is no significant relationship between age of the respondent, the number of years in practice, place of practice, affiliation with a teaching hospital, or subspecialty training and vaccine recommendation and administration. There is a significant positive relationship between awareness of the guidelines and the frequency of recommending the Tetanus-Diphtheria-Pertussis (Tdap) vaccine and the Influenza vaccine. Similarly, awareness of the guidelines was related to increased frequency of administering the Human Papilloma Virus (HPV) vaccine and the Influenza vaccine.

Conclusion: Hence, adult vaccination coverage may be promoted by increasing the awareness of the obstetrician-gynecologists of the POGS Clinical Practice Guidelines on Immunization. Although cost remains to be an issue (identified by 93% of the respondents), increasing awareness among OB-GYNs on the importance of adult vaccination through the CPG on Immunization and/or through attendance of the Vaccinology 101 Course through vaccinology courses may ultimately help decrease the incidence of some of the most common infectious diseases affecting the Filipino women and their children. **(Author's abstract)**

Keywords: *Awareness, Obstetrician-gynecologist, Practices, Vaccination, Medicine*

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2016 September,
(Filipiniana Analytics)
NP

0440

Beating the odds: A case report on the successful management of a non-immune hydrops fetalis due to hemoglobin Bart's disease

Abat, Marinella Agnes G. , Javier, Maria Jane Ellise S., Cheng, Maria Rosario

Hemoglobin Bart's hydrops fetalis, characterized by a deletion of all four α -globin genes is the most severe and lethal form of Thalassemia disease. Mortality rate usually ranges from 60-100% of cases.¹⁻⁵ Given the poor overall prognosis, most countries resort to pregnancy termination or expectant management as the only options to offer affected pregnancies.⁵

This paper presents a case of the successful management of a primigravid, diagnosed with hydrops fetalis at 29 4/7 weeks age of gestation. She delivered successfully to a live, preterm, baby boy who was later found out to have hydrops fetalis due to Hemoglobin Bart's disease, and currently, continues to thrive past eight months of age.

This report aims to improve the clinicians' knowledge regarding the work up and management of pregnant patients diagnosed with hydrops fetalis, and increase the clinician's awareness on the epidemiology, importance of targeted screening, and diagnosis of Alpha-Thalassemia in Filipino patients. **(Author's abstract)**

Keywords: *Alpha-Thalassemia, Hemoglobin Barts, Hydrops Fetalis, Philippines, Medicine*

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(Filipiniana Analytics)
NP

A before and after study on the effect of fetal acoustic stimulation test on non stress test parameters

Bautista-Zamora, Brenda Bernadette P. , Dela Rosa, Catherine Ro

Objective: To determine the effect of Fetal Acoustic Stimulation Test on Non Stress Test Parameters

Methods: A total of 650 subjects (power of 80%) were enrolled. Subjects were both high risk and non high risk pregnancies, at more than 36 weeks AOG with normal AFI. All subjects underwent non stress test followed by non stress test with acoustic stimulation test for minimum of 20-40 minutes. Once consent was obtained, a low frequency sound transducer (40 hertz) was applied on the maternal abdomen to provide acoustic stimulation. The data was gathered, analyzed and compared.

Results: Acoustic Stimulation Test improved the results of NST by having reactive results, longer duration accelerations, improved variability from minimal to moderate variability, and increased number of fetal movement.

Conclusion: AST is not a standalone procedure but merely an adjunct to other antenatal tests for fetal surveillance such as BPS and Doppler. **(Author's abstract)**

Keywords: *Non stress test, Acoustic stimulation test, Low frequency sound transducer, BPS, Doppler, Medicine*

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NP

Bicarbonate enhances the inflammatory response by activating JAK/STAT signalling in LPS + IFN- γ -stimulated macrophages

Kawakami, Tomoya , Koike, Atsushi , Maehara, Toko , Hayashi, Tetsuya , Fujimori, Ko

Macrophages, which develop by changing their functions according to various environmental conditions and stimuli, defend against the pathogens and play roles in homeostasis and disease states. Bicarbonate (HCO_3^-) is important in the maintenance of intracellular and extracellular pH in the body. However, the effects of bicarbonate on macrophage function have not been examined. In this study, we investigated the effects of bicarbonate on macrophage activation in lipopolysaccharide (LPS) and interferon (IFN)- γ (LPS + IFN- γ)-stimulated murine macrophage-like RAW264.7 cells. The expression of the interleukin (IL)-6, inducible nitric oxide (NO) synthase and cyclooxygenase-2 genes was enhanced by sodium bicarbonate (NaHCO_3) in a concentration-dependent manner in LPS + IFN- γ -stimulated RAW264.7 cells. The production of IL-6, NO-2 and prostaglandin E2 was also increased by treatment with NaHCO_3 in these cells. Moreover, NaHCO_3 -mediated elevation of inflammatory gene expression was abrogated by solute carrier (SLC) transporter inhibitors. Furthermore, its NaHCO_3 -mediated activation was negated by a JAK inhibitor, tofacitinib. NaHCO_3 -enhanced phosphorylation of STAT1, and its enhancement was abrogated by pre-treating with SLC transporter inhibitors in LPS + IFN- γ -stimulated RAW264.7 cells. In addition, similar results were obtained in murine bone marrow-derived macrophages. These results indicate that bicarbonate enhanced the inflammatory response through the JAK/STAT signalling in LPS + IFN- γ -stimulated macrophages. **(Author's abstract)**

Keywords: *Bicarbonate, Inflammation, JAK/STAT, Macrophage, SLC transporter, Medicine*

The Journal of Biochemistry, Volume No. 167 Issue No. 6, 623-631
2020 June,
(Filipiniana Analytics)
F(S) QP501 J82 167/6 2020

Bilateral internal pudendal artery angiographic embolization of labial metastasis from gestational trophoblastic neoplasia

Soriano-Estrella, Agnes L. , Yap, Bernade

Patients with Gestational Trophoblastic Neoplasia commonly experience bleeding from metastatic sites in the vulvovaginal area. Digital pressure and early institution of chemotherapy usually achieve control of the hemorrhage, but massive hemorrhage ensues in some cases. This paper documents the case of a 48 year-old Gravida 8 Para 7 (7017) who previously underwent total hysterectomy for endometrial mass. On histopathologic examination, it was diagnosed as Choriocarcinoma. Patient was then advised multiagent chemotherapy indicated for high-risk metastatic gestational trophoblastic neoplasia. Chemotherapy was discontinued due to intermittent, profuse, vaginal bleeding that rendered the patient anemic, a contraindication to starting another cycle of chemotherapy. Despite direct pressure on the vulvar mass, the bleeding became intractable, rendering the patient hypotensive and hooked on ionotropes for hemodynamic stability. The only option remaining for the patient was emergency embolization. This paper documents the first embolization to be done in the Philippines for labial metastasis from gestational trophoblastic neoplasia. **(Author's abstract)**

Keywords: *Choriocarcinoma, embolization, Gestational trophoblastic neoplasia, Emergency angiographic embolization, Massive hemorrhage, Vulvovaginal metastasis, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 40 Issue No. 2, 27-31

2016 June,

(Filipiniana Analytics)

NP

Blood thicker than water: A case report on familial ovarian cancer

Paulino-Morente, Joanna Marie A., Penolio, Vaneza Valentina

Reported is a case of a 43 year-old Gravida 3 Para 3 (3003) admitted due to progressive abdominal enlargement, weight loss and dyspnea. Admitting Impression was Ovarian New Growth, bilateral, malignant, with secondary Pleural Effusion. She underwent Total Abdominal Hysterectomy, with Bilateral Salpingo-oophorectomy, bilateral lymph node dissection, peritoneal fluid cytology, and infracolic omentectomy. Hispathology report showed a Malignant Mixed Mullerian Tumor of both ovaries with metastasis to the colorectal serosa. It is noteworthy that the patient has two siblings who succumbed to advanced stage ovarian cancer. This case report will discuss the possible hereditary genetic mutations involved in the development of familial ovarian carcinoma. **(Author's abstract)**

Keywords: *Ovarian cancer, Malignant mixed mullerian tumor, Hereditary breast ovarian cancer syndrome, Hereditary non-polyposis colorectal cancer syndrome, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 39 Issue No. 2, 24-32

2015 June,

(Filipiniana Analytics)

NP

Blooming Too Soon: A Case of Precocious Puberty
Ang-Sy, Sabrina , Bautista, Joy J. , Dagala, Emmanuel L. , Yu, Nina Roj

Precocious puberty is the onset of pubertal development at an earlier age than is expected based upon established normal standards. The cause of precocious puberty may range from a variant of normal development (eg. premature adrenarche or isolated premature thelarche) to pathologic conditions with significant risk of morbidity and even death (eg. malignant germ-cell tumor or astrocytoma). A case of an 18 month old female presenting with vaginal bleeding following a previously noted breast enlargement was described. Initial assessment based on the patient's history and physical examination is suggestive of precocious puberty. Hormonal studies indicated normal levels of FSH and LH, with an elevation in estradiol. Radiographic analysis showed a normal bone age. Cranial MRI revealed no abnormal masses. Sonographic evaluation showed bilateral cystic masses in the ovaries. A diagnosis of peripheral precocious puberty associated with functional ovarian cysts was made, and the patient was monitored for progression of pubertal development. **(Author's abstract)**

Keywords: *Vaginal bleeding, Precocious puberty, Malignant germ-cell tumor, Medicine*

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(Filipiniana Analytics)
NP

0446

Calcifying Fibrous Tumor of the Jejunum in a 27-year-old Primigravid: A Case Report
Masalunga, Marvin

The most common mesenchymal tumors of the gastrointestinal tract are gastrointestinal stromal tumors (GIST) and smooth muscle neoplasms; however, other soft tissue tumors may also present in the intestines and cause diagnostic dilemmas. We report the case of a 27-year old primigravid, with no known complications, who underwent cesarean section for cephalopelvic disproportion. Intraoperatively, a well-demarcated, solid mass measuring 1.5 x 1.0 x 0.7 cm was noted at the jejunum. The patient underwent segmental resection of the mass. Microscopic examination of the mass reveals a non-encapsulated, solid mass composed of bland spindle cells and dense, hyalinized collagen in whorls and bundles. Dystrophic calcifications and a lymphoplasmacytic inflammatory infiltrate are seen within the collagen bundles. Immunohistochemical staining with desmin, CD117, and DOG-1 was done, which are all negative. The case was signed out as calcifying fibrous tumor (CFT). Inclusion of CFTs in the differential diagnoses for mesenchymal tumors of the gastrointestinal tract is important, as these neoplasms are benign and have an excellent prognosis.

Keywords: *calcifying fibrous tumor, jejunum, neoplasms, fibrous tissue, Medicine*

Philippine Journal of Pathology, Volume No. 5 Issue No. 1, 39-43
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(Filipiniana Analytics)

Cardiovascular Risk Factor Modification in Asymptomatic Adults and Implications for Pilots

Wirawan, I Made Ady , Griffiths, Robin F , Larsen, Peter D

This study aims to examine the available evidence that supports a more aggressive approach to managing asymptomatic people with low to intermediate cardiovascular risks; to evaluate the appropriate threshold for initiating pharmacologic interventions to treat hyperglycaemia, hyperlipidaemia, and hypertension; and to describe the implications for airline pilots. A systematic search was performed employing an OvidSP interface, including all EBM Reviews, EMBASE, and Ovid MEDLINE databases. Data, including sixteen randomised controlled trials, on the appropriate threshold for initiating pharmacologic interventions were extracted. Studies on the treatment of hyperlipidaemia indicated that the threshold for initiation of intervention in intermediate-risk people is a LDL-C level of 3.36 mmol/l (130 mg/dl). There was no lower limit or optimal LDL-C level below which further reduction was no longer beneficial. Studies on the treatment of hyperglycaemia suggested that a threshold of fasting plasma glucose of ≥ 5.3 mmol/l (95 mg/dl) and 2-hour postprandial glucose level of 7.8 mmol/l (140 mg/dl) is reasonable for initiating pharmacologic intervention. Initiating treatment to people with a blood pressure of $\geq 130/\leq 89$ mmHg or $\leq 139/\geq 85$ mmHg significantly reduced the risk of developing stage 1 hypertension. Multifactorial intervention studies showed that, in hypertensive patients (BP $\geq 160/\geq 100$ mmHg), initiating treatment to those with a total cholesterol of 6.5 mmol/l (251.35 mg/dl) or higher resulted in a significant reduction in the risk of developing fatal and non-fatal cardiovascular events. The available evidence from large quality trials supports a more aggressive approach to managing hyperglycaemia, hyperlipidaemia, and hypertension in asymptomatic pilots with a 5-year CVD risk of 5-10% and 10-15%. **(Author's abstract)**

Keywords: *Cardiovascular risk, Airline pilot, Asymptomatic population, Risk reduction, Medicine*

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F(S) RC967 J82 42/2 2020

A Case of Ovotesticular Disorder of Sexual Development (45 XO/46 XY: Mosaicism versus Chimerism)

Toral, Jean Anne B. , de Jesus, Ma. Sher

Ovotesticular disorder of sex development (OT-DSD), previously known as true hermaphrodite, is a rare disorder of sexual differentiation in which the gonads of an individual are characterized by the presence of both mature ovarian and testicular tissues. The diagnosis has traditionally been applied only if an individual has 1) histologically verified ovarian follicles or proof of their prior existence (e.g. corpora albicantia) and 2) seminiferous tubules or spermatozoa. This paper introduces you to a 14 year-old, who presented with primary amenorrhea and enlarging abdominal mass, underwent exploratory laparotomy, salpingo-oophorectomy, histologically diagnosed as a possible case of a true hermaphrodite and chromosomally diagnosed as 45XO/46XY who developed endodermal sinus tumor, a germ cell tumor, considered highly malignant. **(Author's abstract)**

Keywords: *Chimerism, Endodermal sinus tumor, Mosaicism, Ovotesticular Disorder of Sex Development (OT-DSD), True hermaphrodite, 45X/46XY, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 39 Issue No. 1, 43-54
2015 March,
(Filipiniana Analytics)
NP

A Case of Pulmonary Infectious Bulla Caused by *Mycobacterium Avium*

Morimoto, Toshiki , Uchimura, Keigo , Yamasaki, Kei , Kanda, Hideki , Sakakibara, Hideki , Hashimoto, Kohei , Nakamura, Kei , Shigemi, Saki , Miyata, Emiko , Yamaguchi, Yudai , Ikegami, Hiroaki , Tachiwada, Takashi , Kawanami, Toshinori , Tanaka, Fumihiro , Yatera, Kazuhiro

A 37-year-old Japanese man presented with a bulla with niveau-like opacity in the right upper lung on chest radiography. Air-fluid level gradually increased despite broad-spectrum antibiotic therapy. Right upper lobectomy was performed, and epithelioid granuloma with mycobacteria was histopathologically observed. Bacterial culture of the fluid was negative, but mycobacterial culture was positive for *Mycobacterium avium*; therefore, the patient was diagnosed with pulmonary infected bulla caused by *Mycobacterium avium*. He was further treated with antimycobacterial agents after resection of the infected bulla. To our knowledge, this is the first report of pulmonary infected bulla caused by only *Mycobacterium avium* in the English literature. **(Author's abstract)**

Keywords: *Nontuberculous mycobacteria, Infectious bulla, Lung resection, Mycobacterium avium, Medicine*

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(Filipiniana Analytics)
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A Case of Ruptured Full Term Interstitial Pregnancy With A Live Mother And Baby

Latido-Engay, Lennybeth , Sandoval, Janmarie F. , Comia, Jr., Pedro Ed M. , Koa-Malaya, Rena Cristina , Mendoza, Mela

Interstitial pregnancy is a form of ectopic pregnancy in an unusual location, implanting on the intramural part of the fallopian tube. Because the myometrium is highly distensible, it may allow an interstitial pregnancy to advance up to 16 weeks where it usually presents with rupture. Its late diagnosis and severe hemorrhagic complication accounts for a higher mortality rate compared to other ectopics. On the other hand, interstitial pregnancies that progress to term or near term are extremely rare. From the 10 cases published in literature reporting the delivery of a live term or near term fetus, only 1 of these cases has antenatally diagnosed the presence of interstitial pregnancy prior to rupture by investigating a probable placenta accreta found on ultrasound. This report discusses a case of a ruptured full term interstitial pregnancy diagnosed intraoperatively which resulted to a live mother and baby,

and describes retrospectively the similar ultrasound findings of placenta accreta which was realized after rupture. **(Author's abstract)**

Keywords: *Live full term, Ectopic pregnancy, Interstitial pregnancy, Cornual pregnancy, Ultrasound, Placenta accreta, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 38 Issue No. 1, 50-57
2014 March,
(Filipiniana Analytics)
NP

A case report on catamenial epilepsy

Murao, Lara Jessica G., Penolio, Vaneza Valentina , Apepe, Emille Ter

A case of a 17-year-old nulligravid with onset of seizure episodes since menarche is reported. She was diagnosed with Seizure Disorder treated with Phenobarbital and was seizure free for 2 years. Two years prior to consult, seizure recurrences were noted to coincide with menstruation, hence, was diagnosed with Catamenial Epilepsy. Patient was shifted to Lamotrigine but seizure exacerbations were still observed, prompting referral to the Reproductive Medicine service for adjunctive hormonal therapy. Depot medroxyprogesterone acetate was added to the antiepileptic drug which provided seizure control. Adjunctive hormonal therapy proved to be helpful in the management of intractable seizures in this patient. The report aims to give a better understanding of the neuroactive properties of estrogen and progesterone and its role in the development of Catamenial Epilepsy. Gender-related and psychosocial issues in the treatment of Epilepsy in the child-bearing years up to the menopause are also discussed. **(Author's abstract)**

Keywords: *Catamenial epilepsy, Seizure, Antiepileptic drug, Hormonal therapy, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 3, 33-38
2017 May to June,
(Filipiniana Analytics)
NP

0452

A case report on ovotesticular disorder of sexual development 46, XY with malignant mixed germ cell tumor (yolk sac tumor, dysgerminoma, mature cystic teratoma)

Estuart, Darleen S.J., Bonguyan, Tessa

This paper reports a case of a 19 year-old born with ambiguous genitalia, who presented with abdominopelvic mass diagnosed to have Ovotesticular Disorder of Sexual Development (OT-DSD) 46, XY with Malignant Mixed Germ Cell Tumor (Yolk Sac Tumor, Dysgerminoma, Mature Cystic Teratoma). She underwent two surgeries and had gone through six cycles of Vincristine, Dactinomycin and Cyclophosphamide chemotherapy.

OT-DSD is a rare condition by the presence of both histologically proven testis and ovary in the same individual. The report describes the clinical, biochemical, imaging, and histopathologic findings and outcomes of OT-DSD complicated with gonadal tumor. Diagnostic work up, pre-operative preparations, intra operative management, post-operative follow up and chemotherapy along with psychiatric support for gender identity and assignment are discussed. This paper emphasizes the importance of multidisciplinary effort from the different fields of medicine namely reproductive endocrinology, gynecologic oncology, surgery, psychiatry, and anesthesiology. **(Author's abstract)**

Keywords: *46, XY disorders of sex development, Disorders of sexual development, Neoplasms, Germ cell and embryonal, Ovotesticular disorder of sexual development, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 40 Issue No. 2, 32-37
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(Filipiniana Analytics)
NP

0453

Cervical length measurement using an improvised cervicometer as a predictor of spontaneous preterm birth in uncomplicated pregnancies in a tertiary hospital in Southern Luzon in 2015: A cohort study

Burog, Honorata Lalaine P., Mendoza, Mela

Background: Preterm birth is a major public health problem and cervical length measurement using transvaginal ultrasound is the gold standard for predicting its occurrence. However, its cost and the limited availability of equipment and trained sonologists has limited its use only for screening for high risk patients and those with history of preterm birth. Those patients without risk factors are not recommended for routine screening although they constitute the majority of spontaneous preterm deliveries. The newly marketed cervicometer, Cervilenz©, an easy-to-use and cheaper device, has been found to be comparable to transvaginal ultrasound in predicting preterm birth and may be used to universally screen all patients regardless of their risk status, however, at present, it is only available in the United States.

Objective: This study aims to determine if an improvised cervicometer such as the insertion tube of an intrauterine device can also be used as a screening tool for predicting spontaneous preterm birth in uncomplicated pregnancies.

Methods: The cervical length of 126 patients at 14 to < 37 weeks age of gestation were measured and patients were followed up until delivery.

Results: It was found that those with short cervical length of < 25mm were not an increased risk of preterm birth (p-value > 0.05 at CI 95%). The negative predictive value was found to be 100%, 95%, and 88% at < 32, <34, and <37 weeks, respectively, in which those with normal cervical length were less likely to deliver prematurely, and this finding is comparable to the outcome of Cervilenz© studies.

Conclusion: An improvised cervicometer such as the insertion tube of an intrauterine device can be used as a screening tool for predicting spontaneous preterm birth in uncomplicated pregnancies. **(Author's abstract)**

Keywords: *Cervical length, Cervicometer, Premature, Preterm birth, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 40 Issue No. 4, 1-6
2016 December,
(Filipiniana Analytics)
NP

0454

Cervical pessary in prevention of preterm birth: A case series *Tabaquero, Mary Anne , Hernandez, Erika G*

Preterm birth defined as birth between 20-37 weeks age of gestation, poses major concerns as it causes serious health problems. Across 184 countries, the rate of preterm birth ranges from 5% to 18% of babies born and the Philippines ranks 8th out of 184 countries for the number of babies born prematurely, and ranks 17th for the total number of deaths due to complications from preterm birth. Management of incompetent cervix as one of the causes of preterm birth is cerclage. However, pessary insertion is an alternative especially in cases where cerclage may not be employed. To date, there have been no local published reports on effectiveness of pessary in prevention of preterm birth. Hence this study aims to report on cases supporting the use of pessary in preterm birth. This is a case series of three patients with short functional cervical lengths (<2.5 cm) seen in ultrasound, managed with pessary insertion showing its effectiveness in prolonging pregnancy. In conclusion, pessary is an affordable and safe alternative management of preterm birth which may be employed in our setting. Future clinical trials may be helpful in strengthening this evidence. **(Author's Abstract)**

Keywords: *Pessary, Preterm birth, Cervical incompetence, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 1, 26-31
2017 January to February,
(Filipiniana Analytics)
NP

Cervicovaginal agenesis: A case report

Dichoso, Marian C. , Sasuca, Krist

Congenital absence of the uterine cervix and vagina in the presence of a functional endometrium is an extremely rare congenital anomaly. Women born with this anomaly present with collection of blood in the uterine cavity or hematometra, disabling pelvic pain and progressively worsening endometriosis. Presented is a case of a 16 year-old girl with severe pelvic endometriosis and hematometra complicated by cervicovaginal agenesis. She was managed by total abdominal hysterectomy with bilateral salpingectomy, left oophorocystectomy and adhesiolysis. Surgical management of congenital cervicovaginal agenesis remains controversial. The decision to do a conservative surgical procedure or a hysterectomy depends on the clinical profile of the patient, the expertise of the surgeon, the extent of the malformation and its association with other Mullerian anomalies. **(Author's abstract)**

Keywords: *Cervicovaginal agenesis, Endometriosis, Hematometra, Mullerian anomalies, Medicine*

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NP

C-Myc-activated long non-coding RNA PVT1 enhances the proliferation of cervical cancer cells by sponging miR-486-3p

Wang, Chang , Zou, Hao , Chen, Aiping , Yang, Hongjuan , Yu, Xinping , Yu, Xiao , Wang, Yankui

Cervical cancer is one of the most prevalent gynecological malignancies. Although the functions of long non-coding RNA (lncRNA) plasmacytoma variant translocation 1 (PVT1) and c-Myc in tumorigenesis have been acknowledged, the roles of c-Myc and lncRNA-PVT1 in the proliferation of cervical cancer are still unclear. Our study is designed to demonstrate the regulatory network involving c-Myc and lncRNA-PVT1 in cervical cancer. Quantitative real-time PCR and western blot assays were performed in our research to estimate the expression levels of RNA and proteins. CCK8 assays were applied to demonstrate the viability of HeLa and SiHa cells. Immunofluorescence assay was then used to investigate the co-localization of lncRNA-PVT1 and miR-486-3p. Binding of c-Myc to the promoter region of PVT1 was identified by ChIP-assay. Functionally, upregulation of lncRNA-PVT1 enhanced the proliferation and viability of cervical cancer cells. Mechanistically, lncRNA-PVT1 sponged miR-486-3p and released its repression of extracellular matrix protein 1. Besides, c-Myc functioned as an activator of lncRNA-PVT1 and upregulated its expression by binding to the promoter of PVT1 in cervical cancer cells. lncRNA-PVT1 was upregulated by c-Myc and thus enhanced the proliferation of cervical cancer cells by sponging miR-486-3p. **(Author's abstract)**

Keywords: *Cervical cancer, Plasmacytoma variant translocation 1 (PVT1), Polymerase chain reaction , Medicine*

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Comparative Analysis Of Pelvic Floor Imaging In Women With Pelvic Organ Prolapse Versus Controls Using Two-Dimensional and Three-Dimensional Transperineal Ultrasound

Amosco, Melissa DL. , Adan, Katrina Fidel

Background: Pelvic organ prolapse (POP) is a condition characterized by the failure of various anatomic structures to support the pelvic viscera. There has been a growing interest in the understanding of the underlying structural alterations in the pelvic floor, and the use of 2D and 3D transperineal ultrasound has recently been shown to be able to determine biometric indices of the levator hiatus and pubovisceral muscle.

Objective: To compare the morphological features and biometric parameters of the pelvic floor of patients with pelvic organ prolapse with age-matched controls using 2D and 3D transperineal ultrasound.

Methodology: In a prospective case control study, 35 patients with prolapse and 25 asymptomatic controls were assessed. Bladder symphyseal distance (BSD), bladder neck descent, angle of urethral inclination, retrovesical angle, bladder wall thickness and quantification of prolapse were measured on rest and valsalva maneuver on 2D ultrasound. Anteroposterior and lateral diameters, as well as pubovisceral muscle thickness was measured on rest and valsalva on 3D ultrasound.

Results: BSD was significantly lower in the prolapse group ($p=0001$), while bladder wall thickness was significantly higher ($p=0024$). AP and lateral diameters were significantly higher in the prolapse group both at rest and on valsalva, showing that there is significant correlation with increased diameters at rest and pelvic organ descent. Pubovisceral muscle thickness was lower in the prolapse group compared to controls both at rest and on valsalva.

Conclusion: Levator hiatal dimensions and biometry indices of the pubovisceral muscle can be determined using 2D and 3D transperineal ultrasound. There is significant correlation between anteroposterior and lateral diameters, as well as pubovisceral thickness, with pelvic organ descent. **(Author's abstract)**

Keywords: *Pelvic organ prolapse, Levator hiatus, Pubovisceral muscle, 2D transperineal ultrasound, 3D transperineal ultrasound, Medicine*

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NP

Comparative efficacy of oral lactobacillus rhamnosus (protexin) against metronidazole (flagyl) in the treatment of bacterial vaginosis: A randomized clinical trial

Roque, Rosendo R. , Go, Marianne R

Background: Bacterial vaginosis (BV) is a very common gynecologic infection associated with a vast number of complications both in gynecologic and obstetric patients. One of the major concerns in its treatment is a high recurrence rate which was multifactorial and the choice of the suitable antimicrobial is important to decrease the treatment failure.

Methods: All gynecologic patients aged 18 years old and above in a tertiary hospital diagnosed with bacterial vaginosis according to Amsel's criteria. A total of 80 patients were randomly assigned into two groups; one group to receive oral Probiotics (Protexin) while the other group to receive Metronidazole. The patients will be followed up accordingly on Days 1, 3, 7 and 30 and will be graded according to Amsel's criteria. The primary endpoint of the study is the treatment of bacterial vaginosis based on the mentioned criteria. (Anukam, 2006)

Results: The results showed that there was a significant improvement in the character of the vaginal discharge based on the Amsels criteria on Day 1 of treatment for the Metronidazole group (0/40; 100%, p value <0.001) and Day 3 for Oral Lactobacillus arms. (7/40; 20%, p value 0.01). The Metronidazole arm showed a significant improvement in the fishy odor on vaginal examination with addition of 10% KOH on day 1 (0/40; 100%, p value <0.001) and Day 3 for oral Lactobacillus (0/40; 100%, p value 1.00). Then vaginal pH was noted to be more acidic in the Metronidazole compared to the Protexin arm on Day 1 of treatment (0/40; 0% and 40/40; 100% p value <0.001 respectively). However, both groups had no significant difference of vaginal pH in Days 3-30 (0/40; 100% p value 1.0). There was a note of less number of recurrence rate under the Protexin arm after 30 days of treatment (5/40; 12.5% p value <0.001) as reflected in the decreased number of clue cells.

Conclusion: The Metronidazole remains to be the standard treatment for Bacterial vaginosis. There was also faster recovery and clinical improvement in the character of the vaginal discharge, amount and smell based on the Amsel's criteria as early as Day 1 of follow-up; however, there was a small number of population with poor compliance resulting to higher recurrence rate which was evident on the 30th day of follow-up. The oral lactobacillus rhamnosus showed advantage over Metronidazole due to lower recurrence rate of BV as noted on Day 30 of follow up. **(Author's Abstract)**

Keywords: *Bacterial vaginosis, Oral lactobacillus, Metronidazole, Medicine*

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NP

0459

Comparative Study of Four Methods of Clinical Estimation of Fetal Weight in the Late Third Trimester Admitted for Delivery: A Prospective Study *Crisologo, Ma. Cristina P. , Asto, Ma. Rosie*

Background: Clinical estimation of fetal weight is a basic skill an obstetrician should master. Although the use of ultrasound has gained much popularity in the recent decade, in low resource settings, most patients do not have the luxury to have an ultrasound done for their babies, more so a sonographic estimate. Four methods of clinical estimation – Dare's method, Johnson's formula, Modified Johnson's Formula and abdominal palpation were used in the study and compared with the actual weight of the baby.

Objective: To come up with the best/most reliable clinical method to use in estimating fetal weight among women in the late third trimester of pregnancy.

Methodology: The study used a prospective study design. All women beyond 34 weeks age of gestation admitted at the OB admitting section and ward were included. A total of 370 parturients were included. Senior residents on duty at the OB admitting section were asked to record their examination after the patient had given her consent. Those admitted at the wards were examined by the resident in charge and principal investigator after the patient consented to the study. The actual birthweight was used as the gold standard value. Paired Sample T-test was used to determine whether the estimates are comparable to the actual birthweight. Each formulae for estimating fetal weight were compared to the actual birthweight. Percentage error of each was computed and compared using the Wilcoxon Test and absolute percentage error were compared using T-test. One-way ANOVA test was used to determine inter-observer difference.

Results: The palpation method had the lowest mean absolute error, followed by Dare's Method. The Modified Johnson's Formula had the highest mean absolute error. Similarly, the palpation method had the highest number of estimates with difference less than 100 grams from the actual value. This is consistent with the absolute percent error which showed that the palpation method has most estimates (73.2%) having less than 5% error, followed by Dare's Method (49.5%), and Johnson's (38.6%). The Modified Johnson's Formula had the least number of estimates at less than 5%, at 10.8%. At 34 – 37 weeks age of gestation, the palpation method had the lowest mean percentage error (0.41±5.18) followed by Modified Johnson's formula (1.40±15.54). The Johnson's Formula yielded the highest percentage error at 13.29±18.56. At 37 weeks age of gestation and above, the Dare's

Method had the lowest mean percentage error (0.91 ± 8.51), followed by the Johnson's Formula (-1.14 ± 9.62), then Palpation Method (-1.59 ± 6.16).

Conclusion: Based on the data garnered, the clinician's estimate using the palpation method is by far the most accurate in any age of gestation, followed by Johnson's Method, with the Modified Johnson's Method with the least accurate estimate. At 34-37 weeks age of gestation, the palpation method had the closest estimate. At 37 weeks age of gestation and above, the Dare's Method is more superior. **(Author's abstract)**

Keywords: *Estimated fetal weight, Dares method, Johnsons formula, Modified Johnsons Formula, Leopolds Maneuver, Medicine*

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0460

Comparing Differential Gene Expression in Chronic Traumatic Encephalopathy, Parkinson's Disease, and Bipolar Disorder

De Los Reyes, Francia Victoria

Chronic traumatic encephalopathy (CTE) is a progressive neurodegenerative disorder that is defined, neuropathologically, by the presence of aggregated hyperphosphorylated tau in the neurons and astrocytes of the perivascular area that is located deep in the cerebral sulci. The lesion is associated with repetitive brain trauma, from the spectrum of asymptomatic subconcussive head injury to grossly identifiable features of concussion. Although the diagnostic neuropathology of CTE is well-characterized, the precise mechanism that causes this to occur in CTE is not yet clearly elucidated. The features of hyperphosphorylated tau in CTE is quite similar with Alzheimer's Disease (AD), as is the reduced expression of certain genes that are required to dephosphorylate tau, which is the putative culprit in the generation of amyloid aggregates and hyperphosphorylated tau. In comparison, Parkinson's Disease (PD) is a neurodegenerative disease that is caused by accumulation of misfolded alpha-synuclein (α -syn) that causes the formation of intraneuronal Lewy Body aggregates. The pattern of accumulation for α -syn involves the olfactory bulb and the gut with progressive involvement of the posterior part of the brain. Despite establishing the presence of two different intraneuronal inclusions for CTE and PD, contact sports associated with the clinical spectrum of CTE has been shown to present with Parkinsonian features along with dementia. Mood disorders has been reported to occur in patients with these neurologic conditions. Several studies have documented that patients had a previous experience of traumatic brain injury prior to the diagnosis of Bipolar Disorder (BD). A review of electronic literature suggested that having an earlier diagnosis of BD increased the likelihood of having a diagnosis of PD in the future. This research aimed to compare the over- and underexpressed genes in cases with Parkinson's Disease (PD), cases with Bipolar Disorder (BD), and cases with Chronic Traumatic Encephalopathy (CTE) versus normal controls. This was done to determine if parallel overexpression in certain genes may indicate the possible association at the level of gene expression. Identifying similar RNA sequence establishing gene expression may provide an insight to the relationship of the diseases in terms of pathobiological behavior. Determining the similar over- or underexpression pattern may provide an insight on the common pathobiologic mechanisms that may be the reason for the three disorders being associated by way of pre-morbid or co-morbid condition. Transcripts from the public domain archive of the NCBI SRA were identified for the RNA sequence (RNAseq) of interest using the search string "Chronic Traumatic Encephalopathy," "Bipolar Disorder," and "Parkinson." Only public domain transcriptome files of post-mortem brain samples labeled as RNAseq data extracted thru the Illumina platform that have a paired normal control were selected. A total of ten (10) cases for each disorder and thirty (30) normal subjects for control in the NCBI SRA RNAseq database with a whole exome sequence file that was available for public domain use was utilized for differential gene expression analysis. Among 21,122 identified genes from the RNAseq, the analysis was able to identify 26 genes exhibiting increased expression of up to >15 log₂ fold change among cases with CTE, PD, and BD compared with normal controls. In contradistinction, only 6 well-described genes exhibited a decreased expression among cases with CTE and BD compared to normal controls. However, there were no identified genes that exhibited underexpression in cases with PD compared with normal controls. The identification of parallel gene overexpression among the CTE, BD, and PD groups with respect to structural integrity, cellular metabolism,

homeostasis, and apoptosis may indicate a common pathway that have been initiated as part of the response to maintain tissue function or as a consequence of the underlying pathobiologic mechanism that caused the primary lesion.

Keywords: *differential gene expression, RNAseq, Chronic Traumatic Encephalopathy, Bipolar Disorder, Parkinson's Disease, Medicine*

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2020,
(Filipiniana Analytics)

0461

Comparison of Digital Image Analysis and Conventional Microscopy in Evaluating Erythrocyte Morphology in Peripheral Blood Smears

Yturralde, Erick M

The use of conventional microscopy still forms the basis for the morphologic evaluation of erythrocytes despite widespread use of automated tests in the hematology laboratory. This requires a considerable length of time and expertise, and have the potential of becoming a source of errors and delay in reporting. Advances in image processing and machine learning in recent years have shown acceptable performance characteristics and have promising applications in the diagnostic laboratory. Use of these newly-developed technologies can address the stated problems and provide an alternative approach in the microscopic analysis of erythrocytes. This prospective validation study compared digital image analysis using a machine-learning based image recognition algorithm with conventional microscopy performed by a trained microscopist, which served as the reference standard. Random deidentified anticoagulated peripheral blood samples submitted to the hematology laboratory were assessed. A total of 956 erythrocytes were evaluated after image processing using support vector machine and routine microscopy as classifiers of erythrocytes into three categories: size, central pallor, and shape. The tested software was able to achieve a strong level of agreement compared to conventional microscopy, having kappa values ranging from 0.81 to 0.86. Accuracy for size, central pallor and shape were 89.88%, 93.72% and 87.89%, respectively. The validated image recognition software is an acceptable diagnostic test in determining erythrocyte morphology in peripheral blood smears. Its integration can potentially minimize hands-on time and improve the diagnostic laboratory workflow.

Keywords: *erythrocyte morphology, digital imaging, microscopy, Medicine*

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2020,
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0462

Comparison of the Efficacy of Guava Leaves Extract as Hot Steam and Wash versus Intake of Oral Antibiotic for Postpartum Wound Healing after a Normal Spontaneous Vaginal Delivery with Episiotomy

Mercado, Maria Dolores A. , Co-Sy, Eileen , Garcia, Shyla , Angeles, Unika

Objective: This single blind, randomized, controlled trial investigated the efficacy of the use of guava leaves as hot steam and wash for postpartum wound healing in women who underwent normal spontaneous delivery with episiotomy.

Methods: A total of 127 women aged 18 to 45, from 37 to 41 weeks AOG, served as subjects in this study. They were allocated to three treatments arms (guava group, antibiotic group and guava + antibiotic group) through block randomization. The guava group used a solution from boiled guava leaves as hot steam and wash tid for 7 days while the antibiotic group took amoxicillin 500 mg tid also for 7 days. The 3rd arm used both treatments. Outcomes included pain score (measured using Visual Analog Scale) and wound healing (measured using REEDA Scale) at 24 hours, 3 days and 7 days postpartum.

Results: Showed that mean pain scores and mean REEDA scores of the women in the three groups at 24 hours, 3 days and 7 days postpartum were not significantly different. Likewise, the risk of wound dehiscence was not significantly different for the three treatment arms. Therefore, this study revealed that guava leaves extract used as hot steam and wash is as effective as the standard oral antibiotic intake for postpartum wound care but no additional benefit is derived from combining guava leaves and oral antibiotic.

Conclusion: Guava leaves used as hot steam and wash may be recommended for postpartum wound care after normal spontaneous vaginal delivery with episiotomy. **(Author's abstract)**

Keywords: *Medicine, Guava leaves, Postpartum wound healing, Episiotomy*

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0463

Comparison of the efficacy of metronidazole and metronidazole plus probiotics capsule in the treatment of bacterial vaginosis among non-pregnant patients seen at the outpatient department of a tertiary hospital: A single blind randomized controlled trial
Reyes, Lylah D. , Co, Jennifer T. , Muñoz-Cruz, Mar

Background: Bacterial vaginosis (BV) is the most prevalent cause of symptomatic vaginitis. In the Philippines, prevalence of BV is at 28.16%. The mainstay for the treatment of BV is Metronidazole. Although antibiotic therapy has been shown to eliminate BV associated organisms, there is extremely high recurrence rate.

Objective: To compare the efficacy of metronidazole and metronidazole plus lactobacilli tablet in the treatment of bacterial vaginosis among non-pregnant patients seen at the outpatient department of a tertiary medical center.

Methodology: The population included non-pregnant women ages 15 to 44 years old, with bacterial vaginosis diagnosed by Amsel's criteria and Nugent's scoring. The participants were randomly assigned to their treatment group, one is Metronidazole only and the other received Metronidazole plus Lactobacillus tablet. All participants followed up on day 8, 15, 22 and 56 from initiation of treatment resolution or persistence of symptoms and collection of vaginal specimen for gram stain and inquire on adverse effects.

Results: On day 8 of treatment, there were significantly more participant in the metronidazole plus probiotic arm with an estimated lactobacilli count of more than 30/hpf as compared to metronidazole alone. On day 15 post treatment, there was no statistically significant difference with the estimated Gardnerella vaginalis count, lactobacilli count, presence or absence of malodorous vaginal discharge between the metronidazole plus probiotic and the metronidazole alone arm. With metronidazole plus probiotic group, the proportion of women with less than 30 per hpf Gardnerella vaginalis count and absent foul smelling vaginal discharge were accounted among 100% of the participants from day 8 to 56 post treatment. The early reduction in the causative agent and symptoms can be attributed to an increase in the estimated lactobacilli count sustained until 56 days post treatment metronidazole plus probiotic. However, from day 15 to 22 and 56 post-treatment, the proportion of participants who had a nugent's score of less than 4 were greater for both the metronidazole plus probiotic (100%) and metronidazole alone (95%) arm, when compared to day 8 post-treatment. This finding for the metronidazole plus probiotic group is due to sustained reduction in the Gardnerella vaginalis count and increase in lactobacilli counts. Potentially, the metronidazole plus probiotic treatment was found to be more favorable in sustaining the normal

flora and probiotic can be used as an adjunct may enhance the efficacy of metronidazole in the treatment of BV.

Conclusion: Metronidazole plus probiotic and metronidazole only treatment are comparable in treating bacterial vaginosis. In terms of restoring and maintaining the normal flora, metronidazole plus probiotic appears to be more significantly efficacious. Probiotic in the form of lactobacilli is a promising adjunct to enhance the efficacy of metronidazole in the treatment of bacterial vaginosis. **(Author's abstract)**

Keywords: *Bacterial vaginosis (BV), Probiotic, Lactobacilli, Amsels criteria, Nugent score, Metronidazole, Medicine*

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NP

0464

Comparison of the operative and post operative outcome between episiorrhaphy with and without application of policresulen solution

Rey-Matias, Christian Joanna B. , Reyes, Lylah D. , Patetico, Ashm

Background: Episiotomy is a surgical incision of the perineum performed to widen the vaginal opening to facilitate the delivery of an infant. Bleeding is its common complication. A certain technique must be followed so as not to incur either dyspareunia, dehiscence or infection. Hence the application of policresulen solution during repair may minimize bleeding and facilitate better wound healing.

Objective: To compare the operative and post-operative outcome between episiorrhaphy with and without application of policresulen solution during repair among puerperal patients admitted in a tertiary hospital.

Methodology: One hundred participants were randomized to two treatment groups. Those assigned to treatment A (n=50) underwent episiorrhaphy with policresulen solution application while those in treatment B (n=50) served as the control group. The main outcome measures were estimated blood loss, operative time and duration of wound healing.

Results: There was a significantly shorter mean operative time with the participants in the Policresulen group (20.92 ± 0.90 minutes) as compared to the Control group (53.8 ± 1.79 minutes) with a P-value of < 0.001 . Estimated mean blood loss was significantly lesser in the Policresulen group (195.2 ± 5.69 ml) than in the Control group (373.8 ± 16.14 ml) having a P-value of < 0.001 . The duration of wound healing was also shorter among those in the Policresulen group (1.42 ± 0.09 weeks) than those in the Control group (2.14 ± 0.17 weeks), with a P-value of 0.003. A significantly greater proportion of participants had shorter operative time, lesser blood loss and shorter duration of wound healing in the policresulen group. (p-value < 0.005)

Conclusion: Policresulen solution application has a good hemostatic effect on the episiotomy wound hence shortened the operative time. It also has a good wound healing effect reflected by a shortened duration of wound healing of the episiotomy wound. **(Author's abstract)**

Keywords: *Policresulen solution, Episiotomy, Blood loss, Operative time, Wound healing, Medicine*

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NP

Comparison of the Use of Papanicolaou-stained Cervical Cytological Smears with Gram-stained Vaginal Smears for the Diagnosis of Bacterial Vaginosis Among Out-Patient Pregnant Patients

Bombase, Claire Liz I., Fuentes-Fallarme, Analyn

Background: Bacterial vaginosis is the most common vaginal infection among reproductive age women. It has been associated with preterm labor and emerged as a formidable disease entity associated with catastrophic sequelae especially in pregnant patients. Papanicolaou smear is the most successful screening test for cervical carcinoma in the history of medicine. Albeit being used by some clinicians as screening tool for bacterial vaginosis, it was not well established.

Objective: To determine the diagnostic accuracy of papanicolaou smear in making the diagnosis of bacterial vaginosis in pregnant patients with the vaginal gram stain used as diagnostic standard.

Methodology: A total of 321 pregnant patients who consulted for prenatal care at the outpatient department of obstetrics and gynecology of the tertiary training hospital between November 2013 to June 2014 were included in the study. Each patient had gram-stained vaginal smear and standard pap smear done consecutively. The sensitivity, specificity, positive predictive value, negative predictive value and the likelihood ratios of pap smear were determined.

Results: The sensitivity of pap smear in determining the presence of bacterial vaginosis is 70.5%, its specificity of 93.6%, positive predictive value of 80.5%, negative predictive value of 89.3%. Likelihood ratio of a positive result is 10.9 and 0.3 for a negative result with diagnostic accuracy of 87.23%.

Conclusion: These results support the reliability of the pap smear in the diagnosis of bacterial vaginosis in asymptomatic pregnant patients. Since pap smear and gram stain have close diagnostic accuracy, duplication of the test could reasonably be avoided in most patients. **(Author's abstract)**

Keywords: *Bacterial vaginosis, Pap smear, Gram stain, Medicine*

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(Filipiniana Analytics)
NP

Comparison On The Effect Of “Hands on” versus “Hands off” Method On Perineal Trauma And Delivery Outcome Among Nulliparous Women

Tremedal, Ma. Asuncion , Galbo, Pherdes , Ypil, Amethyst , Yap-Icamina, Elsie I. , Diaz-Roa, Larisa

Objectives: The study aims to determine the degree of perineal trauma, postpartum perineal pain and fetal outcome in both groups using different maneuvers: “hands on” and “hands off” during the late second stage of labor among nulliparous women without episiotomy.

Design: Prospective Randomized Research Study

Setting: This study was conducted at the Labor / Delivery room complex from June 2012 to February 2013.

Methods: In the second stage of labor, nulliparous women (120) giving birth were randomly allocated to “hands on”(the fetal head delivery was performed by using a towel-draped, gloved hand exerting forward pressure on the chin of the fetus through the perineum just in front of the coccyx) and “hands off” (the OB resident observed the parturient woman and did not touch perineum during the second stage of labor and the other hand exerts pressure superiorly against the occiput while the fetus was delivering) group. The two groups were compared as to their demographic characteristics, perineal trauma, postpartum pain and neonatal outcomes.

Results: All women were nulliparous, term, without episiotomy and had similar demographic characteristics. Pain scores were collected in both groups after delivery. No significant difference in the postpartum pain scale values at 24 hours ($p=0.134$), 7 days ($p=0.866$), to 10 days ($p=0.77$) in both groups. Perineal trauma showed no significant association between laceration ($p=0.212$). Differences in APGAR Score as a measure of neonatal outcome was similar in both groups.

Conclusions: This study showed that perineal trauma, postpartum perineal pain and neonatal outcome between the “hands on” versus “hands off” have no significant difference. Therefore, it is not necessary to use “hands on” technique on all women in labor during the second stage of labor. **(Author's abstract)**

Keywords: *Medicine, Hands on, Hands off, Perineal Trauma, Postpartum pain*

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NP

0467

Confidentiality of medical data and public safety and health *Lofredo, Marlon Patrick*

The principle of confidentiality and privacy of medical data is an important patient safeguard and is rooted in fundamental human rights and ethics principles. The call for the voluntary waiving of confidentiality and privacy by COVID+ and suspected patients by involved healthcare and legal organizations in the Philippines has put into the debate table its ethical and legal permissibility. The common rule is confidentiality and privacy of information is not absolute, and there are laws delineating specific grounds for its permissible breaching. The basic ground for breaching is the primacy of public health and safety over individual right to privacy. The common good remains the primary consideration when conflict between principles occur in cases of pandemics like COVID-19. But care must be taken to ensure that patients are not discriminated and stigmatized as a result of the breach of confidentiality and privacy of medical data. The rule of thumb given by the Philippine National Privacy Commission is gather only what is necessary and disclose only to proper authorities. Breaching does not mean disclosed data is universally accessible. Governments must ensure that confidentiality remains protected even when such right is temporarily withheld as demanded by the principles of respect for persons, human dignity, autonomy, and justice.

Keywords: *medical data, data privacy, COVID-19, Philippine National Privacy Commission, confidentiality, health security, Medicine*

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2020,
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0468

The constitutive high-affinity Met-binding site in the kringle domain is dispensable for the signalling activity of hepatocyte growth factor

Umitsu, Masataka , Sakai, Katsuya , Tamura-Kawakami, Keiko , Matsumoto, Kunio , Takagi, Junichi

Activation of a tyrosine kinase receptor Met by hepatocyte growth factor (HGF) requires binding of proteolytically activated, two-chain (tc) HGF, but the biochemical detail of this ligand–receptor interaction specificity remains elusive because biologically inactive single chain (sc) HGF can also bind to Met with high affinity. We found that

this proteolysis-independent Met binding can be eliminated by mutagenesis introduced in the kringle domain without losing the ability to bind and activate cellular Met receptor after proteolytic activation, arguing against this site's involvement in the physiological signalling. This non-signal producing Met-HGF interaction can also be eliminated by addition of a heparin mimetic sucrose octasulphate (SOS). By including SOS in the running buffer, we succeeded in detecting cleavage-dependent tHGF-Met complex formation by size exclusion chromatography. **(Author's abstract)**

Keywords: *Hepatocyte growth factor, Kringle domain, Ligand/receptor interaction, Met receptor, Size exclusion chromatography, Medicine*

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2020 June,
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F(S) QP501 J82 167/6 2020

0469

Correlation of Adverse Neonatal Outcomes of Pregnant Women with Hypertensive Disorders Using the Middle Cerebral Artery and Umbilical Artery Pulsatility Index Ratio

Salvador, Floriza C. , Serrano, Mahar

Background: Doppler velocimetry studies of placental and fetal circulation can provide important information regarding fetal wellbeing providing an opportunity to improve fetal outcome. The present study was undertaken to evaluate the role of middle cerebral to umbilical artery pulsatility index ratio (MCA/UA PI Ratio) as a predictor of perinatal outcome in hypertensive pregnant patients admitted from January 2009- December 2011 at the De La Salle-University Medical Center

Objectives: To correlate the neonatal outcomes of hypertensive pregnant women at 28-34 weeks AOG with the middle cerebral artery and umbilical artery pulsatility index ratio.

Study Design: A retrospective cohort was done on records of patients with hypertension who delivered from January 2009 - December 2011. Doppler ultrasound results of said patients that were available at the OB-GYN ultrasound section were recorded and the MCA/UA PI Ratio computed. Doppler results were then compared to neonatal outcomes

Results: Results of the study shows that 10 out of the 17 hypertensive patients with decreased MCA/UA PI Ratio developed Intrauterine growth restriction. 62.5% of those patients who had normal MCA/UA PI Ratio results delivered term, while 87.5% of those who had decreased MCA/UA PI Ratio delivered preterm (P <0.002). However results of the MCA/UA PI ratio has no association on APGAR scores at 1 and 3 minutes.

Conclusion: Decreased MCA/UA PI Ratio results have an association on the development of adverse neonatal outcomes in hypertensive pregnant women. **(Author's abstract)**

Keywords: *Hypertensive Disorders, Middle Cerebral Artery, Umbilical Artery Pulsatility Index Ratio , Medicine*

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NP

Correlation of Tumor-associated Leukocytes with Prognosis of Colorectal Carcinoma based on Pathologic Stage

Tindoc, John Anthony

To perform a pilot study investigating the presence of correlation between the different mean tumor-associated leukocyte counts and the prognosis of colorectal cancer based on pathologic stage. A cross-sectional study design, involving colorectal carcinoma cases in the Philippine General Hospital from 2015-2016. Proportional allocation stratified random sampling was done, with pathologic stage (AJCC 7th Edition) as the stratifying variable, collecting a total of 59 samples. Tissue sections from the samples were evaluated for the different tumor-associated lymphocyte counts. Correlation coefficients were computed to determine their correlation with pathologic stage as surrogate marker for prognosis. Of the myriad populations counted within and around the tumor mass, total lymphocyte, cytotoxic T-cell (CD8+ T-cell), neutrophil, macrophage, and plasma cell populations have significant correlation with pathologic stage as surrogate marker for prognosis of colorectal carcinoma. The immune system appears to have a significant role in the natural history of colorectal carcinoma. The tumor-infiltrating lymphocytic population and especially the CD8+ T-cell subset, neutrophils, and macrophages are correlated with better prognosis. The same observation can be seen with the peritumoral CD8+ T-cells, neutrophils, macrophages, and plasma cells.

Keywords: *colorectal adenocarcinoma, tumor-infiltrating lymphocytes, peritumoral leukocytes, prognosis, Medicine*

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2019,
(Filipiniana Analytics)

The correlations of cholesterol, glucose and uric acid levels in saliva, urine and serum samples

Bais, Dionell G. , Ababa, Charmaine E. , Durano, Lourivy P. , Sarabia, Ace Ronald C., Cal, Klariz Antoni U. , Villegas, Rochell

Blood testing is one of the most common tests performed in a clinical laboratory. The venipuncture method, if not done properly, might lead to any of the known complications like hematoma, needle phobia, anxiety and fainting. This led the researchers to embark on the study using other body fluids specifically, saliva and urine, as substitute of blood for the determination of cholesterol, glucose and uric acid levels in the body. The study was done by obtaining blood, urine, and saliva samples from fifteen patients with pathologic conditions, namely: Hypercholesterolemia, Diabetes Mellitus, and Gouty Arthritis. Following standard protocol for spectrophotometry, urine and saliva samples were tested for cholesterol, glucose, and uric acid. The tests were done three times with no specific time interval. The mean values obtained from saliva and urine was compared to that in the blood. The correlation between the results from saliva and blood, and urine and blood were determined with the use of Spearman – rho coefficient. The study showed that there is no significant relationship between the levels of cholesterol, glucose and uric acid in saliva and urine with that in the blood. However, the results revealed a significant relationship between the level of glucose in saliva and blood. **(Author's abstract)**

Keywords: *Clinical chemistry, Glucose, Uric acid, Cholesterol, Saliva, Urine, Spectrophotometry, Spearman-rho coefficient, Philippines, Medicine*

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2015,
(Filipiniana Analytics)
NP

**Creation of a scoring system to determine endometrial cancer risk using the
International Endometrial Tumor Analysis (IETA) features**
Gorgonio, Nephtali M. , Sigue, Airen J. , Mendoza, Sharon Jo

General Objective: To determine endometrial cancer risk among patients with abnormal uterine bleeding based on the International Endometrial Tumor Analysis (IETA) features.

Specific Objectives: 1. To described the profile of patients with AUB suspected of having endometrial pathology; 2. To describe sonologic features of patients with AUB suspected of endometrial cancer using IETA features; and 3. To determine the association of a scoring system and endometrial cancer risk.

Methods: We prospectively studied 542 participants who came in the CWCU of CSMC with a diagnosis of AUB from July 1, 2016 to December 31, 2016. We excluded patients with endometrial thickness of less than 4 mm on gray-scale sonography, those with echnical difficulties in assessing the endometrium such as in cases of very large myomas, absence of histopathological diagnosis, and those whose sampling was done as an office procedure. A total of 98 participants were included, 89 (90.8%) had benign pathologies and 9 (9.2%) were malignant. Patient characteristics including, age, gravidity, BMI, medical history, and endometrial assessment using IETA were tabulated with each characteristic given a score of 0-3 depending on the degree of risk factor. Percentages, Pearson Chi-square Test with corresponding P-value and ROC curve analysis were performed.

Results: The best predictors for endometrial cancer were age more than 50 years, nulligravid, BMI of more than 25, and presence of hypertension and diabetes mellitus. Sonographic features based on IETA showed an endometrial thickness of more than 20 mm, irregular endometrial-myometrial junction, heterogenous endometrium, presence of multiple and large vessels on doppler analysis, contributed to endometrial cancer risk. These variables were used to create a scoring system with an area under the curve of 0.974 giving the best cut-off value of more than or equal to 9, with 100% sensitivity and 89% specificity.

Conclusion: Among patients with abnormal uterine bleeding and endometrial thickness of more than 4mm, we can predict the risk for endometrial cancer and aid the clinician in decision making on who may be managed conservatively or aggressively based on the value obtained from the scoring system. The study, however, needs to be validated prior to use in clinical practice. **(Author's abstract)**

Keywords: *AUB, Endometrial pathology, Colon stone, IETA, Medicine*

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NP

**Cross-contamination in Molecular Diagnostic Laboratories in Low- and Middle-income
Countries: A Challenge to COVID-19 Testing**
Albano, Pia

At the start of the pandemic, the Philippines had to send swab samples to the Victorian Infectious Diseases Reference Laboratory in Melbourne, Australia for COVID-19 confirmation. With the increasing number of suspected cases needing confirmatory diagnostic testing, there was a demand to rapidly expand the capacity for widescale testing. Remarkably, within 200 days from announcement of the first confirmed COVID-19 case in the Philippines in January 30, 2020, the country has been able to expand its testing capacity from one national reference laboratory, the Research Institute for Tropical Medicine (RITM), to more than 100 licensed reverse

transcription-polymerase chain reaction (RT-PCR) and cartridge-based PCR laboratories across the country. Due to the shortage of a trained clinical laboratory workforce, diagnostic centers are forced to hire additional personnel who have limited experience and technical knowledge and skills of molecular assays, especially in processing specimens, interpreting the results, identifying errors, and troubleshooting, in order to meet the demand of increased testing. Thus, the vulnerability to diagnostic errors, including cross-contamination, is increased and with the tendency for generating false positive results that can compromise the health of the patient and disrupt the efficacy of public health policies and public health response, surveillance programs, and restrictive measures for containing the outbreak. Hence, this review article aims to present the different sources of contamination in the laboratory setting where RT-PCR assays are conducted, as well as provide efficient, effective and feasible solutions to address these issues, most especially in low- and middle-income countries (LMICs) like the Philippines.

Keywords: *SARS-CoV2, LMICs, RT-PCR, cross-contaminations, quality control, diagnosis, Medicine*

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2020,
(Filipiniana Analytics)

0474

Development and Pilot Implementation of a Ladderized Biosafety Training Program in a Specialty Infectious Disease Hospital and Research Institute
Medina, Plebeian

Biosafety is the application of laboratory practices, use of safety equipment and implementation of procedures in laboratory facilities when working with potentially infectious microorganisms to protect not only the laboratory worker, but also the general public and the environment. Biosafety training specifically structured based on risk is vital to establish a safe working environment to reduce the risks of unintentional exposure and/or intentional release of infectious microorganisms. In 2016, a ladderized 3-step biosafety training program was established by the Research Institute for Tropical Medicine, a specialty infectious disease hospital and National Reference Laboratory in the Philippines. The training program includes 1) Biosafety 101, offered to all new RITM employees; 2) Applied Biosafety training, especially designed for laboratory personnel; and 3) Advanced Biosafety training, focused on developing Biosafety Officers and infectious disease outbreak responders. A 30% increase in awareness on biosafety has been achieved among participants of the first two steps of the program, with the third module to be implemented in 2017.

Keywords: *biosafety, biosafety training program, biosecurity, Medicine*

Philippine Journal of Pathology, Volume No. 2 Issue No. 1, 5-11
2017,
(Filipiniana Analytics)

0475

Development of microbial culture medium using golden apple snail (*Pomacea canaliculata*) meat extract and latundan (*Musa sapientum*) pulp powder as nutrient source
Romanillos, Sheila Mae A. , Cabacha, Marjorie A. , Derecho, Rich Adrian E. , Barluado, Mary J

The use of culture media for growing microorganism is an important phase in diagnostic microbiology since it provides medical technologist a presumptive clue of the type of organism present and helps eliminate unnecessary biochemical tests for identification. Culture media are composed of nutritional and growth factors needed for the cultivation of bacteria. Most commercially prepared culture media are costly, and the price is added into the laboratory fees paid by patients. This study determined the potential of golden apple snail (*Pomacea canaliculata*) and latundan (*Musa sapientum*) as nutrient source for culture media. Quantitative nutritional analysis of latundan and golden apple snail using atomic absorption spectrophotometry showed high concentrations of carbohydrates and proteins, and trace amounts of nitrogen, magnesium, zinc, iron, phosphorous and calcium. Extracts of latundan and golden apple snail were formulated into experimental media with distilled water and plain agar as solidifying agent. The capacity of the formulated culture media to sustain growth of *Staphylococcus aureus*, *Escherichia coli* and *Aspergillus niger* was evaluated and compared using nutrient agar and Saboraud's dextrose agar which are the positive controls. Results showed that the experimental media sustained growth of *E. coli* and *A. niger* from 24 to 72 hours but not on *S. aureus*. **(Author's abstract)**

Keywords: *Diagnostic microbiology, Culture media, Pomacea canaliculata, Musa sapientum, Atomic absorption spectrophotometry, Philippines, Medicine*

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2015,
(Filipiniana Analytics)
NP

0476

Diagnosis And Management Of Hypervascular Placental Polypoid Masses (Placental Polyps): A Report Of 4 Cases

Bustamante, Lara Marie D. , Adan, Katrina Fidel

A placental polyp is a polypoid or pedunculated mass or fragment of placental tissue retained in the uterine cavity for an indefinite period of time after abortion or partuition. These retained fragments of placental tissues, especially the hypervascular types, are common causes of vaginal bleeding in the puerperium, or occasionally, months or years after abortion or partuition, and may cause profuse hemorrhage. It is rare with an incidence of < 0.25% of all pregnancies. Despite its rarity, it is potentially life threatening, and high clinical suspicion and prompt and early diagnosis is essential, as well as an accurate diagnosis of neovascularisation to prevent hemorrhagic complications. We present four cases of hypervascular placental polypoid masses wherein thorough history taking and physical examination, in conjunction with serum β -HCG levels and transvaginal ultrasonography with Color Doppler findings led to the prompt diagnosis of this clinical entity. Pelvic ultrasound with Doppler imaging is the most useful initial test for a suspected hypervascular lesion, because it distinguishes tissue with abundant vascularity from that with little or no blood supply. Other useful diagnostic procedures include Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) angiography. Successful conservative management of placental polypoid masses by methotrexate administration, hysteroscopic resection, and uterine artery embolization (UAE) have been reported. Hysterectomy is reserved for patients with intractable vaginal bleeding and patients who are no longer desirous of future pregnancies. Hysteroscopic resection was successfully done in two cases presented, while the other two patients underwent hysterectomy. **(Author's abstract)**

Keywords: *Placental polyp, Hypervascular placental polypoid mass, Transvaginal ultrasound, Color Doppler ultrasonography, Uterine artery embolization, Hysteroscopic resection, Methotrexate, Medicine*

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2014 March,
(Filipiniana Analytics)
NP

Diagnostic Performance of Mean Platelet Volume in the Diagnosis of Acute Myocardial Infarction: A Meta-Analysis

Acapulco, Kathrina As

The aim of this systematic review and meta-analysis is to determine summary estimates of the diagnostic accuracy of mean platelet volume for the diagnosis of myocardial infarction among adult patients with angina and/or its equivalents in terms of sensitivity, specificity, diagnostic odds ratio, and likelihood ratios. The primary search was done through search in electronic databases. Cross-sectional, cohort, and case-control articles studying the diagnostic performance of mean platelet volume in the diagnosis of acute myocardial infarction in adult patients were included in the study. Eligible studies were appraised using well-defined criteria. The overall mean MPV value of those with MI (9.702 fl; 95% CI 9.07 – 10.33) was higher than in those of the non-MI control group (8.85 fl; 95% CI 8.23 – 9.46). Interpretation of the calculated t-value of 2.0827 showed that there was a significant difference in the mean MPV values of those with MI and those of the non-MI controls. The summary sensitivity (Se) and specificity (Sp) for MPV were 0.66 (95% CI; 0.59 - 0.73) and 0.60 (95% CI; 0.43 – 0.75), respectively. The pooled diagnostic odds ratio (DOR) was 2.92 (95% CI; 1.90 – 4.50). The positive likelihood ratio of MPV in the diagnosis of myocardial infarction was 1.65 (95% CI; 1.20 – 22.27), and the negative likelihood ratio was 0.56 (95% CI; 0.50 – 0.64). The intended role for MPV in the diagnostic pathway of myocardial infarction would perhaps be best as a triage tool. MPV values can discriminate between those who have MI and those without. For a patient with angina presenting with elevated MPV values, it is 1.65 times more likely that he has MI. It is implied that the decision to treat a patient with angina or its equivalents as a case of MI could be supported by an elevated MPV value.

Keywords: *mean platelet volume, MPV, myocardial infarction, angina, chest pain, Medicine*

Philippine Journal of Pathology, Volume No. 5 Issue No. 2,
2020,
(Filipiniana Analytics)

Djulis (*Chenopodium formosanum*) and its bioactive compounds affect vasodilation, angiotensin converting enzyme activity, and hypertension

Chen, Shih-Ying , Chu, Chin-Chen , Chyau, Charng-Cherng , Yang, Jing-Wen , Duh, Pin-Der

Djulis (*Chenopodium formosanum*) and its bioactive compounds' effect on vasodilation, angiotensin-converting enzyme activity (ACE) and hypertension, in vitro and in vivo, were evaluated. Rutin, betanin and another 13 compounds were observed in the water extracts of djulis (WECF) using HPLC-DAD and HPLC-MS/MS analysis. WECF, rutin and betanin showed significant induction of nitric oxide and prostacyclin as well as expression of eNOS and COX-2. In addition, WECF, rutin and betanin showed a marked inhibitory effect on ROS generation, peroxynitrite levels and ACE activity. Oral administration of WECF, rutin and betanin lowered systolic and diastolic blood pressures of spontaneously hypertensive rats. The ACE activity in the plasma of WECF-, betanin- and rutin-administrated groups was lower than the untreated group. Overall, WECF bioactive compounds could potentially be used as functional ingredients for preventing hypertension. **(Author's abstract)**

Keywords: *Angiotensin-converting enzyme, Antihypertensive effect, Djulis, Chenopodium formosanum, Nitric oxide, Prostacyclin, Vasodilative effect, Medicine*

Food Bioscience, Volume No. Issue No. , 1-11
2019,
(Filipiniana Analytics)
F(S) TP248.65.F66 F66 n32 2019

Double Burden: A Rare Case of Turner's Syndrome with Concomitant Mayer-Rokitansky-Kuster-Hauser Syndrome

De Chavez, Maria Delina E., Capco-Dichoso, Marian , Opulencia, Ma. Ruz

Amenorrhea is one of the most taxing cases in the field of gynecologic endocrinology. Turner's and Mayer-Rokitansky-Kuster-Hauser Syndromes are the two most common separate causes of primary amenorrhea worldwide. Presented here is a rare case of an 18-year old female with Turner's Syndrome and concomitant Mayer-Rokitansky-Kuster-Hauser Syndrome. The worldwide incidence of both syndromes occurring simultaneously in an individual is 1 in 15,000,000 livebirths. The index patient presents with primary amenorrhea and chromosomal analysis revealed 45,X. Transrectal ultrasound noted absence of both the uterus and the ovaries. Early detection of this rare case is important for the initiation of hormone replacement therapy. Adoption is the only option to have a child since Assisted Reproductive Technique (ART) by means of in-vitro fertilization is not applicable for patients with both of these syndromes. Parents and children must be educated regarding the limitations of current knowledge about the management of both Turner's and Mayer-Rokitansky-Kuster-Hauser Syndromes and must be given realistic expectations with respect to sexual function and social acceptance. **(Author's abstract)**

Keywords: *Primary amenorrhea, Turners Syndrome, Mayer-Rokitansky-Kuster-Hauser Syndrome, Medicine*

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2014 June,

(Filipiniana Analytics)

NP

Double Trouble Establishing Synchronous Primary Tumors of the Urothelium and Prostate by Immunohistomorphology: A Report of Two Cases

Ong, David Jerome

Synchronous primary tumors of the urothelium and prostate are a diagnostic challenge among pathologists. Differentiating carcinomas of urothelial and prostatic origin requires careful assessment of histomorphology coupled with ancillary studies such as immunohistochemistry stains (IHC) to support the diagnosis. We report two cases of adult patients who underwent transurethral resection of the prostate (TURP), with two distinct morphologies noted on routine H&E sections. After a panel of immunohistochemical stains (HMWCK, CK5/6, CK7, CK20, GATA-3, p63, NKX3.1, and PSA), both cases were signed out as papillary urothelial carcinoma and prostatic acinar adenocarcinoma. Correlation of histomorphology with an IHC panel consisting of cytokeratins (CK5/6, CK7, CK20), a urothelial marker (GATA-3), and at least two prostatic markers (PSA, NKX3.1) is recommended in such cases.

Keywords: *immunohistochemistry, PSA, prostatic adenocarcinoma, urothelial carcinoma, Medicine*

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2020,

(Filipiniana Analytics)

Dynamic regulation of subcellular mitochondrial position for localized metabolite levels

Alshaabi, Haya , Heininger, Meara , Cunniff, Brian

Mitochondria are not passive bystanders aimlessly floating throughout our cell's cytoplasm. Instead, mitochondria actively move, anchor, divide, fuse, self-destruct and transfer between cells in a coordinated fashion, all to ensure proper structure and position supporting cell function. The existence of the mitochondria in our cells has long been appreciated, but their dynamic nature and interaction with other subcellular compartments has only recently been fully realized with the advancement of high-resolution live-cell microscopy and improved fractionization techniques. The how and why that dictates positioning of mitochondria to specific subcellular sites is an ever-expanding research area. Furthermore, the advent of new and improved functional probes, sensitive to changes in subcellular metabolite levels has increased our understanding of local mitochondrial populations. In this review, we will address the evidence for intentional mitochondrial positioning in supporting subcellular mitochondrial metabolite levels, including calcium, adenosine triphosphate and reactive oxygen species and the role mitochondrial metabolites play in dictating cell outcomes. **(Author's abstract)**

Keywords: *Metabolite gradients, Mitochondrial contacts, Mitochondrial dynamics, Reactive oxygen species, Medicine*

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2020 February,
(Filipiniana Analytics)
F(S) QP501 J82 167/2 2020

Effect of information support on the level of acceptability on use of technology in the different nursing areas among nursing students

Pantalan, Sheena Mariam S. , Guinsatao, Maricar D. , Birondo, Charmaine P. , Bartolay, Geovie N. , Gaspar, Charity Leene S. , San Juan, Mila Gr

The advent of technology, especially in smart phones and its applications has greatly influenced the quality of health care. Moreover, presently these are used by health care professionals in effectively delivering quality health services. Smart phones, are cellular telephones with built-in applications and internet access that can be used to assist health care workers in delivering health care education and drug dosage calculation. It has applications that can be utilized in managing chronic diseases, diet, exercise, and as a lifestyle reference. This study employed the quasi-experimental research design in gathering data and assessment of relationships. Results of the study showed that there is no significant difference in the level of acceptability on the use of technology in different nursing areas before and after informational support. The results revealed that the level of acceptability on use of technology in the nursing area is already high. Furthermore, the level of acceptability on the use of technology is independent of age, year level and socio economic status. From the findings of the study, the researchers recommended further improvement of informational support to increase level of acceptability, and measure level of acceptability on broader inclusion of areas such as nurse-related software and applications. **(Author's abstract)**

Keywords: *Nursing, Healthcare practitioners, Technology, Informational support, Nurse-related software, Quasi-experimental research design, T-test, ANOVA, Philippines, Medicine*

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2015,
(Filipiniana Analytics)
NP

The Effectiveness of Aromatherapy in the Management of Postpartum Pain Among Patients Who Underwent Spontaneous Vaginal Delivery at a Tertiary Hospital

Sun-Cua, Alice , Peralta-Amores,

Background: Oral administration of Nonsteroidal Anti-Inflammatory Drugs has been the mainstay for postpartum pain control in patients undergoing spontaneous vaginal delivery. Aromatherapy is a form of alternative medicine that uses volatile plant materials, known as essential oils, and other aromatic compounds for the purpose of altering the mood, cognitive function or health as well as in reducing sympathetic stimulation.

Objectives: To determine the effectivity of aromatherapy in the management of postpartum pain who delivered vaginally.

Methods: The study is a randomized controlled trial on 64 postpartum patients. Thirty two patients in the aromatherapy group received 2% lavender oil via face mask and another thirty two patients in the control group received unscented oil via face mask.

Results: The demographic profile of the participants demonstrated that the age, gravidity and parity of the two groups were not strong determinants in influencing pain scores while undergoing this study. The findings demonstrated with the influence of aromatherapy, a significant decrease of pain scores was observed. Aromatherapy is able to bring positive effect in the reduction of pain among postpartum patients.

Conclusion: Based on findings, aromatherapy has significant impact in the decrease of pain scores of patients especially at a longer period of exposure. Even there are various intervening factors associated to pain, aromatherapy can be a conclusive non-pharmacologic approach in helping mothers after birth. **(Author's abstract)**

Keywords: *Aromatherapy, Lavender oil, Postpartum, Medicine*

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2014 September,
(Filipiniana Analytics)
NP

The effectiveness of evening primrose oil gel capsule as a cervical ripening agent during labor induction as measured by bishop score on term singleton pregnant patients

Aguilar, Angela S. , Diansuy, Nina N

Background: Pre-induction of labor cervical ripening increases success of labor induction when there is unfavorable cervix. Evening primrose oil soft gel capsule contains linoleic and gamma-linolenic acid, which are precursors of prostaglandins E1 and E2.

Objective: To measure the effectiveness of evening primrose oil capsule as a cervical ripening agent by measuring the Bishop score before and 4 hours after intravaginal insertion of six capsules.

Methods: A quasi-experimental cross-sectional study was conducted from the period of May to July 2016 involving labor induction patients with a Bishop score ≤ 4 , an intact amniotic sac and a Biophysical profile score of 10/10 or 8/8.

Results: Thirteen patients had an average age of 27 ± 6 years, and a mean age of gestation of 40 ± 1 weeks. Seven patients (54%) were nulliparous, 2 (15%) were primiparous and 4 (31%) were multiparous. Seven patients (54%) had hypertension, 1 (8%) had diabetes mellitus, 5 (38%) had post-term pregnancies. A paired t-test was done to check for statistically significant changes in the Bishop score. Change in the Bishop score from baseline to 4 hours after insertion of evening primrose oil capsules was statistically significant ($p=0.001$). Eleven patients (85%) had

improvement in the Bishop score after 4 hours, 4 (31%) of which had a clinically significant change in the Bishop score (≥ 4). Specifically, there were statistically significant changes in the dilatation ($p=0.027$), effacement ($p=0.006$) and consistency ($p=0.002$). The mean birth weight of deliveries was 3192 ± 351 grams. Nine patients (69%) underwent primary low segment cesarean section, six (46%) of which for nonreassuring fetal status, 2 (15%) for arrest in cervical dilatation, and 1 (8%) for intraamniotic infection. Four patients (31%) successfully delivered vaginally.

Conclusion: Results showed a positive effect on the Bishop score during cervical ripening although further studies are needed to establish direct correlation. **(Author's Abstract)**

Keywords: *Bishop score, Cervical ripening, Evening primrose oil capsule, Labor induction, Medicine*

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2017 March to April,
(Filipiniana Analytics)
NP

0485

The effectiveness of normal saline solution with sodium hypochlorite versus hydrogen peroxide as a diabetic foot wound cleanser

Medidas, Mon Juleous C. , Omas-as, Ariane B. , Lasaca, Oswald M. , Corbita, Marinell E. , Cabuntalan, Amerah M. , Cabrales, Rodolfo M. , Ampang, Iriss Ann F., Viduya, Rea Therese

Diabetes mellitus is a chronic disease that can be severely complicated when the patient incur foot ulcer. In fact, development of vascular complications including failure of wound healing process has increased disease mortality over the years. There are different brands of antimicrobial cleansing agents dispensed in Davao City, many are expensive. The most common wound cleanser is Hydrogen Peroxide. This study aimed to perform a microbiological assay of Normal Saline Solution combined with Zonrox as a possible diabetic foot wound cleanser compared with Hydrogen Peroxide as positive control. The study utilized microbiological disk diffusion technique to determine the sensitivity of diabetic wound bacterial isolate by measuring the zones of inhibition (mm). The isolates were swabbed out of the wounds of three diabetic patients and cultured aseptically. Based on the reference sensitivity value of ≥ 16 mm zone of inhibition, all bacterial isolates were found to be sensitive to both the experimental and control agents. Interestingly, using ANOVA, there is a significant difference ($p<0.05$) in the zones of inhibition (mm) between Hydrogen Peroxide and Normal Saline Solution combined with Zonrox in favor for the experimental agent. Hence, the Normal Saline Solution combined with Zonrox exhibited greater zones of inhibition, and may be further tested as an alternative diabetic foot wound cleanser. **(Author's abstract)**

Keywords: *Diabetes mellitus, Foot wound isolate, Sodium hypochlorite, Normal saline solution, Hydrogen peroxide, Philippines, Medicine*

Optima, Volume No. 1 Issue No. 1, 80-87
2013,
(Filipiniana Analytics)
NP

**The Effects Of Changing Surgical Blades After Skin Cutting During Cesarean Section
On The Risk of Postoperative Infectious Morbidity: A Single-Blinded Randomized
Trial At A Tertiary Hospital**

Bravo, Sybil Lizanne R. , Flores, Charl

Background. Various operative procedures and techniques have been made in attempts to diminish the incidence of postoperative wound infection. The use of two surgical knives was found to have no correlation to wound infection in several orthopedic-related surgeries. No studies, however, could be found on the effects of using such technique in cesarean section. The purpose of this study is to determine whether the use of different surgical blades for skin cutting and deep tissue incision decrease the incidence of postcesarean infectious morbidity.

Methods. A total of 190 obstetric patients admitted for scheduled or nonscheduled cesarean section were randomly assigned to two groups by sealed number envelopes. The first group was composed of patients who used only one blade for skin and deep tissue incision. The second group used separate blades. Patients from both groups were assessed days 0 to 2 post-cesarean and 2-4 weeks after (on follow-up). The temperature pattern post-operative was monitored as well as presence of wound discharge, foul-smelling vaginal discharge, persistent abdominal pain, and persistent fever that may indicate surgical site infection, postpartum endometritis, and pelvic abscess. Statistical analysis was performed using the Fisher's Exact test.

Results. Nineteen (11.3%) of 168 patients had superficial surgical site infection, 11 (13.3%) from the single blade group, compared with 8 (9.4%) from the double blade group. The difference between the two groups was not statistically significant ($p=0.29$). None of the patients developed deep incisional or organ space surgical site infection, endometritis, or pelvic abscess post-cesarean. There was also no significant difference for the two groups in temperature pattern and presence of wound discharge or wound dehiscence.

Conclusion. The use of different surgical blades for skin cutting and deep tissue incision does not show to decrease post-cesarean infectious morbidity. It is unnecessary to use two knives for surgical incisions in cesarean section.
(Author's abstract)

Keywords: *Surgical blade, Skin knife, Deep knife, Cesarean section, Postoperative infection, Surgical site infection, Medicine*

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2014 March,
(Filipiniana Analytics)
NP

Efferocytosis during myocardial infarction

Yoshimura, Chikashi , Nagasaka, Akiomi , Kurose,Hitoshi , Nakaya, Michio

Myocardial infarction is one of the major causes of death worldwide. Many heart cells die during myocardial infarction through various processes such as necrosis, apoptosis, necroptosis, autophagy-related cell death, pyroptosis and ferroptosis. These dead cells in infarcted hearts expose the so-called 'eat-me' signals, such as phosphatidylserine, on their surfaces, enhancing their removal by professional and non-professional phagocytes. Clearance of dead cells by phagocytes in the diseased hearts plays a crucial role in the pathology of myocardial infarction by inhibiting the inflammatory responses caused by the leakage of contents from dead cells. This review focuses on the rapidly growing understanding of the molecular mechanisms of dead cell phagocytosis, termed efferocytosis, during myocardial infarction, which contributes to the pathophysiology of myocardial infarction.
(Author's abstract)

Keywords: *Apoptosis, Efferocytosis, Myocardial infarction, Necrosis, Phosphatidylserine, Medicine*

The Efficacy of Evening Primrose Oil as a Cervical Ripening Agent for Gynecologic Procedures: A Single-Blinded, Randomized Controlled Trial

Veloso-Borromeo, Mary Girlie, Verano, Rusienne

Background: Evening Primrose Oil (EPO) is one of the most commonly prescribed cervical ripening agents. Cervical ripening is the softening, effacement, and dilation of the cervix that occur prior to active labor, and is an intervention that is used for certain indications, such as postdates pregnancy. There are gynecologic cases wherein the cervix is closed and dilatation has not occurred making the procedure difficult. In studies, EPO works by softening and ripening the cervix in the pregnant woman. More likely it has the same effects in a non-pregnant patient with regards to softening and dilating the cervix during gynecologic procedures.

Methods: The study was conducted in a tertiary hospital. Patients scheduled for gynecologic procedures were randomly grouped under the control and study group. Both groups had an internal examination during admission. The study group, in addition, were given EPO 4 capsules intra-vaginally, 6 hours prior to the contemplated procedure. Cervical characteristics were assessed initially on admission and pre-procedure. Consistency were assessed using the Consistency Index (CI) and graded as firm=1, medium=2 and soft=3. Dilatation were assessed using the Dilatation Index (DI) and graded as closed=1, admits tip =2, >1cm= 3. Pre-procedure, cervical characteristics and the CDI of both groups were assessed. Hegars dilators were used to assess the degree of dilatation, noting the diameter of dilator that can be introduced freely, and to what diameter the cervix can be maximally dilated.

Results: 80 patients were enrolled in the study; 39 patients were assigned in the control group and 38 patients were assigned in the study group (3 were excluded). In the study group, their DI improved by 36.2% (pre = 1.53+/-0.51 to post = 2.08+/-0.49) (p<0.001), CI increased by 115.9% (pre=1.16+/-0.37 to post = 2.50+/-0.65) (p<0.001), and their CDI changed by 70.6% (pre=2.68+/-0.74 to post = 4.58+/-0.95) (p<0.001). The changes of scores in all the cervical parameters in the study group were statistically significant.

Conclusion: EPO 4 capsules punctured and administered intra-vaginally 6 hours prior to contemplated gynecologic procedure can promote cervical ripening as exhibited by the improvement of the CDI from initial assessment to pre-procedure assessment. **(Author's abstract)**

Keywords: *Evening Primrose Oil, EPO, Cervical Ripening Agents, Medicine*

Efficacy of single dose antenatal corticosteroid on reducing the morbidity and mortality of preterm infants: A retrospective cohort study

Soriano-Estrella, Agnes L., Yu, Mary Li

Objective: To determine the efficacy of a single dose of antenatal dexamethasone on the neonatal morbidity and mortality of preterm infants born between 24 weeks to 33 weeks and six days age of gestation at a tertiary government hospital.

Methods: A detailed chart review of both maternal and neonatal records of all neonates born between 24 weeks and 33 weeks and 6 days age of gestation at a tertiary government hospital from January 1, 2011 to December 31, 2013 was done. Patients were grouped based on maternal exposure to antenatal dexamethasone. After which, rate of neonatal deaths and morbidities were recorded. Chi-square test for categorical variables, independent t-test for continuous data and logistic regression were used for analysis.

Results: Seven hundred and three maternal-neonatal dyads were included. Of these, 120 (17.1%) were not exposed to any antenatal corticosteroid prior to delivery, 347 (49.4%) were exposed to a single dose of 6mg dexamethasone, and 236 (33.5%) received a complete course of four doses of 6-mg dexamethasone before preterm delivery. There were better neonatal outcomes from mothers who received completed doses of antenatal corticosteroids than those who received only a single dose, however in comparison to those who have not received any antenatal corticosteroids, the group that received only a single dose had significantly better neonatal outcome. Logistic regression analysis demonstrated that exposure to a single dose of dexamethasone before delivery was associated with reduction in neonatal mortality, and select neonatal morbidities.

Conclusion: It was observed that there was improved neonatal outcomes in neonates given a single dose dexamethasone compared to those who didn't receive any antenatal corticosteroid. Obstetrician gynecologists should not hesitate in administering antenatal dexamethasone even if completion may not be feasible. **(Author's abstract)**

Keywords: *Antenatal corticosteroid, Dexamethasone, Incomplete doses, Preterm neonates, Single dose, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 39 Issue No. 2, 17-23
2015 June,
(Filipiniana Analytics)
NP

0490

Embolization in abdominal pregnancy: A Case Report *Crisologo, Ma. Cristina P. , Argel, Jay*

Abdominal pregnancy is a rare form of ectopic pregnancy. This type of pregnancy poses a difficult situation since it can incur high morbidity to mother and the fetus. Diagnosis is often difficult and surgical management should be multidisciplinary in approach. This paper presents a case 29-year-old who presents as missed abortion, subsequently diagnosed with abdominal pregnancy. Embolization of major vessels prior to evacuation of products of conception in abdominal pregnancy is a management option to prevent catastrophic complications such as hemorrhage. **(Author's Abstract)**

Keywords: *Abdominal pregnancy, Abortion, Ectopic, Embolization, Laparotomy, Hemorrhage, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 2, 33-37
2017 March to April,
(Filipiniana Analytics)
NP

Enablers of Deterrents to Self-Care Behavior of Filipinos with Diabetes

Agustin, Jr., Stim

This qualitative study focused on the enablers and deterrents of self-care behavior among Filipino adults with Type 2 Diabetes. Purposive sampling was used to recruit participants. Open-ended interviews with diabetic patients and their primary caregivers and self-care diaries were utilized as methods of data collection. Further, review of medical records was done. A “within-case analysis”, (triangulated data from diabetic patients and caregivers) and a “cross-case analysis” (comparing triangulated data among and across all cases) were undertaken, noting a specific pattern-match. Moreover, a constant comparison method with data and review extant literature was done. Different enablers and deterrents to self-care surfaced and included the following: Enablers constituted of the diabetic self as an enabler, help from others, the healthcare provider enabler, spirituality, and the environment. Deterrents, on the other hand, were elements or factors that prevented self-care behavior from occurring. The diabetic self as deterrent, customer displeasure, stress and fiscal constraints were deterrents to self-care behavior. Effective self-care behaviors will be seen if enablers dominate, thus good outcomes and successful management of the disease may be expected. Minimizing the effects of the deterrents, while maximizing and enhancing the aspect of enablers will undeniably foster effective self-care behavior among people with Type 2 Diabetes, highlighting the crucial role of the nurse in restoring balance using the nursing process. **(Author's abstract)**

Keywords: *Enablers, Deterrents, Self-Care Behavior, Diabetes, Medicine*

CNU Journal of Higher Education, Volume No. 5 Issue No. 1, 74-93
2011,
(Filipiniana Analytics)
NP

An Evaluation of Pooling Strategies for RT-qPCR testing for SARS-CoV-2 Infection

Lo, Ray

Sample pooling of COVID-19 PCR tests has been recently proposed as a low-cost alternative to individual tests. This multi-site, laboratory-based, proof-of-concept study explores the feasibility of pooled SARS-CoV-2 RT-qPCR testing, by demonstrating the effect of pooling on sensitivity, specificity, accuracy, number of tests saved, and turnaround time. The research was conducted in two experiments. In Experiment 1, archival nasopharyngeal (NPS) and oropharyngeal (OPS) swab samples were diluted to simulate 5, 10, and 20 sized pools, and tested for SARS-CoV-2 RNA using RT-qPCR. In Experiment 2, actual nasopharyngeal and oropharyngeal swab samples were collected from asymptomatic low-risk volunteers. Aliquots of the samples were pooled following the 5, 10-5, and 20-10-5 multi-staged Dorfman pooling methods and tested. The sensitivity, specificity, accuracy, test savings, and turnaround time for each pooling method were documented. The study provided evidence that pooling of NP and OP samples for SARS-CoV-2 RNA detection using RT-qPCR is feasible and can be implemented in the Philippines. A 2-stage Dorfman 5 pooling strategy appears to be the best method, because it has the highest over-all accuracy, while still achieving acceptable test savings, and turnaround time. Pooling of nasopharyngeal and oropharyngeal swab samples prior to RT-qPCR testing may be considered by select molecular diagnostic laboratories to further increase testing capacity and at the same time reduce the cost of testing.

Keywords: *pooled testing, specimen pooling, RT-qPCR, COVID-19, SARS-CoV-2, Medicine*

Philippine Journal of Pathology, Volume No. 5 Issue No. 2,
2020,
(Filipiniana Analytics)

Evans syndrome complicated by chronic hypertension with superimposed pre-eclampsia with HELLP syndrome in pregnancy: A case report

Mendoza, Maria Czarina , Ching, Maria Ceci

The case of a pregnant woman initially presenting with low platelets and low haemoglobin and subsequently diagnosed as a case of Evans Syndrome is presented. Owing to its extremely low incidence, little research exists investigating pregnancies complicated by Evans Syndrome. Although diagnosis is simple and straightforward, management of a pregnancy of this nature has proven to be complex and challenging. Further complicating the case and its management is the concurrent diagnosis of Chronic Hypertension with Superimposed Pre-eclampsia, in complete HELLP Syndrome. Pre-eclampsia in the background of Evans Syndrome makes this case a truly interesting case. The individual effects of the two disease entities in a single patient are discussed in this report.

(Author's Abstract)

Keywords: *Autoimmune hemolytic anemia, Evans syndrome, HELLP syndrome, Idiopathic thrombocytopenic purpura, Pre-eclampsia, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 1, 32-37

2017 January to February,

(Filipiniana Analytics)

NP

Evolution of a cesarean scar pregnancy into a placenta accreta at term: A case report

Dalawangbayan, Maria Anna Luisa F. , Elep, Rac

This is a case report of a first trimester cesarean scar pregnancy (CSP) evolving into a placenta accreta at term based on the ultrasound imaging. The gestational sac, initially implanted at the site of previous scar, grew into the uterine cavity as the pregnancy progressed and resulted into a viable birth complicated by placenta accreta.

Cesarean scar pregnancy is a rare form of ectopic pregnancy and is associated with increased maternal morbidity and mortality. Thus, early recognition of the salient sonographic findings is crucial because a delay could lead to a life threatening condition. Early diagnosis also gives women the option to choose between expectant management and termination of pregnancy. The exact incidence of CSP has not been determined but its incidence is on the rise in parallel with the high rate of cesarean sections. There are two types of CSP. The first type is due to the implantation of the gestational sac on the scar with progression towards the uterine cavity. In this type expectant management is justifiable since pregnancy may progress into a viable pregnancy. The second type involves growth of gestational tissues towards the bladder and abdominal cavity and is associated with uterine rupture if immediate intervention is not undertaken. In this report, we present a case of a first trimester CSP that was managed expectantly and developed into placenta accreta at term. **(Author's abstract)**

Keywords: *Cesarean scar pregnancy, Ectopic pregnancy, Placenta previa, Accrete, Medicine*

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(Filipiniana Analytics)

NP

Exercise stress test through brisk walking: A complementary way to assess fetal well-being in term pregnancy

Mercado, Maria Dolores A. , Co-Sy, Eileen , Aquino, Princess

Objective: To determine the effect of exercise stress test (EST) through brisk walking on the cardiotocogram tracings (CTGs) and the association of the tracings to neonatal outcomes.

Methodology: This one-group pretest-post test experimental study involved 65 term pregnant women (mean age = 25.94 + 4.66 years) who underwent brisk walking exercise using a motorized treadmill for 30 minutes, following American College of Obstetricians and Gynecologists (ACOG) guidelines for exercise among pregnant women. Pre- and post- walk CTGs were assessed, with presence of post-walk decelerations taken to mean a positive EST. Sensitivity (positive EST in sick / meconium-stained / cord coil babies), specificity (negative EST in well babies), positive predictive value (PPV) (probability of sick / meconium-stained / cord coil babies given positive EST) and negative predictive value (NPV) (probability of well babies given negative EST) were computed.

Results: A significant difference in the proportion of subjects with pre- and post- walk decelerations was noted (p-value = 0.000) wherein 18 subjects (28.13%) without decelerations in the baseline CTG had decelerations in the post-walk CTG. These decelerations were significantly associated to having sick, meconium-stained, or cord coil babies (p-values < 0.05). EST had 80% sensitivity, 75% specificity, 21.1% PPV and 97.8% NPV for detecting sick babies; 75% sensitivity, 77.2% specificity, 31.6% PPV and 95.7% NPV for detecting meconium-stained babies; and 75% sensitivity, 85.7% specificity, 63.2% PPV and 91.3% NPV for detecting nuchal cord.

Conclusion: Exercise stress testing is a complementary way of assessing fetal well-being due to manifestation of decelerations in the post-walk CTG which could have gone undetected if only the resting CTG was done. The EST had high sensitivity for detecting sick / meconium-stained / cord coil babies and has the advantage of reinforcing a reassuring fetal condition due to its high NPV for detecting well babies. **(Author's abstract)**

Keywords: *Cardiotocogram, Exercise test, Fetal heart rate, Medicine*

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2015 September,
(Filipiniana Analytics)
NP

External Quality Assessment Scheme for Transfusion Transmissible Infections Among Blood Service Facilities in the Philippines, 2018

Punzalan, Kenneth Aristotle

External Quality Assessment Scheme (EQAS) is an important and vital component of a quality system to which a retrospective and periodic assessment of quality can be undertaken by an independent external agency.

The Transfusion Transmissible Infections–National Reference Laboratory (TTI-NRL) annually provides an EQAS program for transfusion transmissible infections to all blood service facilities in the Philippines as a requirement for the renewal of their license to operate and raise the quality standards of testing for infectious diseases.

A total of 188 participants registered in the 2018 test event and were given an EQAS panel comprised of a serology program (HVHT4120) and malaria program (MLRA415). Results from the participants were submitted through an online informatics system managed by OneWorld Accuracy Canada using the ISO 13528:2008 Robust Statistics method (Huber's Method). Results were analyzed and evaluated with the reference result from the TTI-NRL.

The HVHT4120 program generated 15,330 results and the MLRA415 generated 940 results. 97 results (0.63%) and 80 results (8.51%) were reported as aberrant from each program respectively and were either due to random or systematic errors.

The data generated from this test event are used for the improvement of the quality processes of each participant and the subsequent renewal of their license to operate as required by local health regulations.

Keywords: *EQAS, transfusion transmissible infections, blood safety, quality improvement, Medicine*

Philippine Journal of Pathology, Volume No. 4 Issue No. 2, 54-57
2019,
(Filipiniana Analytics)

0497

Factors Affecting the Acceptability of HIV Testing Among Pregnant Women Consulting in a Rural Government Tertiary Hospital: A Validation-Reliability Testing of Formulated Questionnaire; A Qualitative Cross-Sectional Survey Study
Mercado, Alberto R. , Sahagun, Rojannah T. , Gabor, Rebecca

Background: In consideration of the prevention of maternal to child transmission, it has been essential to consider once HIV status. HIV testing has been in existence for a long time. In essence, there is a dilemma to consider the factors affecting as well as enhancing its acceptability among pregnant women.

Objective: To determine the factors based on the generated domains which may affect the acceptability of HIV testing among pregnant women consulting in our institution.

Methods: A qualitative descriptive study design in the form of a survey employing validated questionnaires will be given to elicit responses among 246 pregnant women consulting the Out-Patient Department of our institution. Eligibility criteria were determined. The study was divided into pre-validation, validation and administration of questionnaire phases. Statistical analysis utilized were descriptive statistics, t-test, Chi-square test of association.

Results: The age ranged was 14 to 46 years old with a mean age of 27.43 years. 41.4 % had a knowledge about HIV testing whereas, 48.4% did not have knowledge on HIV testing. 37.4% were willing to voluntarily submit themselves for the test. Majority of our respondents (85.4%) were knowledgeable about maternal to child transmission. Split and heterogenous responses were elicited to the validated questionnaires. However, 71.5% believed and preferred pre-natal HIV test counselling. 59.8% believed that it had to be done routinely. The overall acceptability was 37%.

Conclusion: The knowledge on HIV testing was 41%. Its acceptability was 37%. Hence, we conclude that it had a low acceptability rate, therefore we must consider the various responses elicited by the survey in order to improve and enhance its acceptability among pregnant women. **(Author's abstract)**

Keywords: *Human Immunodeficiency Virus (HIV), Acquired Immune Deficiency Syndrome (AIDS), HIV testing, Opt- Out Approach, Pre-natal Counselling, Acceptabili, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 38 Issue No. 1, 9-32
2014 March,
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NP

A Fifteen-Year Report of Serotype Distribution and Antimicrobial Resistance of *Salmonella* in the Philippines

Sia, Sonia

Salmonella enterica ser. Typhi and *Salmonella enterica* ser. Paratyphi are agents of typhoid fever, a severe systemic disease, which remains to be a public health concern in the Philippines. Infection due to non-typhoidal *Salmonella* (NTS), on the other hand, most often results in a self-limiting acute gastroenteritis but may result in invasive disease in some cases. There is scarcity of information on the *Salmonella* serotypes in the Philippines which limits understanding of the distribution, transmission and antimicrobial resistance of these bacteria. This study describes the serotype distribution and antimicrobial resistance of *Salmonella* in the Philippines over a 15-year period. *Salmonella* isolates were collected through the Philippine Department of Health-Antimicrobial Resistance Surveillance Program (DOH-ARSP) from January 1, 2004 to December 31, 2018. The isolates were serotyped using Sven Gard method for slide agglutination using antigens from Denka Seiken (Japan), and S and A serotest (Thailand). Antigenic formula obtained were classified according to White-Kauffmann-LeMinor scheme. Antimicrobial susceptibility testing for ampicillin, ceftriaxone, cefotaxime, chloramphenicol, ciprofloxacin, and trimethoprim-sulfamethoxazole, were performed using both automated and conventional methods (Kirby Bauer disk diffusion and gradient diffusion method). Antimicrobial susceptibility results were interpreted using Clinical and Laboratory Standards Institute (CLSI) 2018 interpretive criteria (M100Ed28E). A total of 2,387 isolates were collected from human specimens during the 15-year study period. There were 69 serotypes of *Salmonella* identified with the most common being *Salmonella enterica* ser. Typhi: n=1895 (79.39%), *Salmonella enterica* ser. Enteritidis: n=182 (7.62%), *Salmonella enterica* ser. Typhimurium: n=87 (3.64%), *Salmonella enterica* ser. Weltevreden: n=24 (1.00%), *Salmonella enterica* ser. Paratyphi A: n=17 (0.71%), *Salmonella enterica* ser. Stanley: n=17 (0.71%), *Salmonella enterica* ser. Anatum: n=13 (0.54%), *Salmonella enterica* ser. Heidelberg: n=12 (0.50%), *Salmonella enterica* ser. Choleraesuis var. Kunzendorf: n=9 (0.38%). The multidrug resistant *Salmonella* serotypes reported in this study were mostly resistant to ampicillin, cefotaxime, ciprofloxacin combinations. This present study showed that prevailing *Salmonella* serotypes in the Philippines were similar with *Salmonella* serotypes reported from other Asian countries. Typhoidal isolates were high among 6-17 years old and were mostly from males. The antimicrobial resistance rates for typhoidal *Salmonella* isolates to ampicillin, chloramphenicol, trimethoprim-sulfamethoxazole, ciprofloxacin, ceftriaxone and cefotaxime were lower compared with the antimicrobial resistance rates for non-typhoidal *Salmonella* isolates. Multidrug resistance for both *Salmonella* Typhi and NTS were relatively low. Continued and enhanced surveillance is needed to monitor the rising levels of antimicrobial resistance, determine risk factors and exposures associated with *Salmonella* Typhi and NTS infection to guide prevention and control measures.

Keywords: *Salmonella typhi*, NTS, serotype distribution, antimicrobial resistance, multi-drug resistance, Medicine

Philippine Journal of Pathology, Volume No. 5 Issue No. 1, 19-29
2020,
(Filipiniana Analytics)

Fulminant Type 1 Diabetes with Diversity in Peripheral Blood Lymphocytes: A Case Report

Kurozumi, Akira , Okada, Yosuke , Miyazaki, Yusuke , Nakayamada, Shingo , Tanaka, Yoshiya

A 29-year-old woman was admitted to our hospital for treatment of fulminant type 1 diabetes (FT1D) with diabetic ketoacidosis. The phenotype of peripheral blood lymphocytes was analyzed using an 8-color flow cytometer. An analysis of the CD4-positive T cells showed a tendency for higher proportions of effector and central memory T cells and a normal proportion of regulatory T (Treg) cells, compared to healthy control. An analysis of B cell differentiation showed higher proportions of switched memory B cells and plasmablasts. The differences in

lymphocyte phenotypes between our case and previously reported cases suggest a diversity of FT1D pathology.
(Author's abstract)

Keywords: *Fulminant type 1 diabetes, Flow cytometry, Peripheral blood lymphocytes, Medicine*

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2020 March,
(Filipiniana Analytics)
F(S) RC967 J82 42/1 2020

0500

Gastric Pyloric Gland Adenoma: A Case Report, Review of Literature, and Diagnostic Challenges in the Philippine Setting

Elomina, Kevin

Pyloric gland adenoma (PGA) is a rare neoplasm with definite malignant potential that is difficult to recognize because of its characteristically bland histology. We present a case of a 74-year old female with chronic, intermittent symptoms referable to gastroesophageal reflux, bloatedness, and frequent flatus, with family history of gastric cancer. Initial endoscopy was done and biopsy revealed an inflammatory pseudopolyp. After six months, repeat endoscopy showed multiple polyps at the cardia, and biopsy of one of the visualized polyps was done. Microscopic sections of the polyp show a neoplasm composed of discrete glands lined by simple cuboidal to columnar epithelial cells with amphophilic to eosinophilic cytoplasm without apical mucin caps, and mild nuclear atypia. Mild epithelial stratification is noted in some of the glands. PAS staining showed granular, cytoplasmic staining in tumor cells. Immunohistochemical staining with P53 showed focal, weak, nuclear staining in tumor cells. Staining with Ki67, MUC2, MUC5AC, and MUC6 were not done because the tissue had already been exhausted. The diagnosis of PGA with low-grade dysplasia has been made. The patient is apparently well, and is advised surveillance endoscopy at six-month intervals. PGA may be diagnosed in a limited resource setting, through thorough histologic examination, and use of special histochemical stains.

Keywords: *Pyloric gland adenoma, P53, Ki-67, GNAS, KRAS, Medicine*

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2019,
(Filipiniana Analytics)

0501

Gene cloning and characterization of thiourocyanate hydratase from *Burkholderia* sp. HME13

Muramatsu, Hisashi, Miyaoku, Haruna, Kurita, Syuya, Matsuo, Hidenori, Kashiwagi, Takehiro, Kim, Chul-Sa, Hayashi, Motoko, Yamamoto, Hiroaki, Kato, Shin-Ichiro, Nagata, Shinji

A novel enzyme, thiourocyanate hydratase, which catalyses the conversion of thiourocyanic acid to 3-(5-oxo-2-thioxoimidazolidin-4-yl) propionic acid, was isolated from the ergothioneine-utilizing strain, *Burkholderia* sp. HME13. When the HME13 cells were cultured in medium containing ergothioneine as the sole nitrogen source, thiourocyanate-metabolizing activity was detected in the crude extract from the cells. However, activity was not detected in the crude extract from HME13 cells that were cultured in Luria-Bertani medium. The gene encoding thiourocyanate hydratase was cloned and expressed in *Escherichia coli*, and the recombinant enzyme was purified to homogeneity. The enzyme showed maximum activity at pH 7.5 and 55°C and was stable between pH 5.0 and 10.5, and at temperatures up to 45°C. The K_m and V_{max} values of thiourocyanate hydratase towards thiourocyanic

acid were 30 μ M and 7.1 μ mol/min/mg, respectively. The enzyme was strongly inhibited by CuCl₂ and HgCl₂. The amino acid sequence of the enzyme showed 46% identity to urocanase from *Pseudomonas putida*, but thiourocanate hydratase had no urocanase activity. **(Author's abstract)**

Keywords: *Ergothioneine, Thiourocanic acid, Thiourocanate hydratase, Urocanase, Burkholdria, Abbreviations, 2-ME, 2-mercaptoethanol, IPTG, Isopropyl- β -D-thiogalactopyranoside, LB, Luria-Bertani, PMSF, Phenylmethylsulfonyl fluoride, UPLC, Ultra-performance liquid chromatography, Medicine*

The Journal of Biochemistry, Volume No. 167 Issue No. 3, 333-341
2020 March,
(Filipiniana Analytics)
F(S) QP501 J82 167/3 2020

0502

Global Voronoi Mapping of HIV Infections *Cempron, Jezyl T., Palompon, Da*

According to UNAIDS (Joint United Nations Programme on (HIV/AIDS) 2009 statistics, around 33.3 million people in the whole world are living with the *Human immunodeficiency virus* (HIV). Although HIV is found in all parts of the world, some areas are more afflicted than others. This study aims to generate a voronoi map that traces the countries where HIV infections are very apparent. Furthermore, this study determined the personal characteristics of the inhabitants and environmental characteristics of the countries that significantly contributed to the increasing HIV infections. Multiple regressions was utilized to find out the predictors of HIV infection and discriminant analysis was used in determining the factors that differentiates between high and low risk countries. Among the nine characteristics identified, only four of them have significantly influenced HIV occurrence, namely: unemployment rate, literacy rate, geographical location and race and only three characteristics differentiated between high and low HIV occurrence countries; population density, national average income per capita and total health expenditure. To determine the speed of the spread of infection per country, HIV rates were gathered from 1990-2009 and were correlated. Eighty countries revealed a significant increase in the speed of the spread of infections from 1990- 2009 while the rest had an insignificant change in the number of infections. The voronoi map was then created illustrating the red, pink and blue areas reflecting the high, moderate and low risk countries, respectively. **(Author's abstract)**

Keywords: *Human immunodeficiency virus (HIV) infections, Voronoi map, Prevalence rate, UNAIDS, Medicine*

CNU Journal of Higher Education, Volume No. 5 Issue No. 1, 60-73
2011,
(Filipiniana Analytics)
NP

0503

High glucose inhibits osteogenic differentiation of bone marrow mesenchymal stem cells via regulating miR-493-5p/ZEB2 signalling *Zhai, Zhongshu , Chen, Wanhong , Hu, Qiaosheng , Wang, Xin , Zhao, Qing , Tuerxunyiming, Muhadasi*

Diabetic osteoporosis (DOP) is attributed to the aberrant physiological function of bone marrow mesenchymal stem cells (BMSCs) under high glucose (HG) environment. MicroRNAs (miRNAs) are involved in the pathological processes of DOP. We aimed to explore the underlying mechanism of miRNA in DOP. BMSCs were cultured in osteogenic medium with HG to induce osteogenic differentiation, and the interaction between miR-493-5p and ZEB2 was assessed by luciferase assay. Herein, we found miR-493-5p is gradually reduced during osteogenic differentiation in BMSCs. HG treatment inhibits osteogenic differentiation and induces an up-

regulation of miR-493-5p leading to reduced level of its downstream target ZEB2. Inhibition of miR-493-5p attenuates HG-induced osteogenic differentiation defects by upregulation of ZEB2. Mechanistically, miR-493-5p/ZEB2 signalling mediates HG-inhibited osteogenic differentiation by inactivation of Wnt/ β -catenin signalling. More importantly, knockdown of miR-493-5p therapeutically alleviated the DOP condition in mice. HG prevents BMSCs osteogenic differentiation via up-regulation of miR-493-5p, which results in reduced level of ZEB2 by directly targeting its 3'-untranslated region of mRNA. Thus, miR-493-5p/ZEB2 is a potential therapeutic target and provides novel strategy for the treatment and management of DOP. **(Author's abstract)**

Keywords: *Bone marrow mesenchymal stem cells, High glucose, miR-493-5p osteogenic differentiation, ZEB2, Medicine*

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2020 June,
(Filipiniana Analytics)
F(S) QP501 J82 167/6 2020

0504

Two hearts, one rhythm: A case report on thoracoomphalopagus twins

Dosdos, Kristina L. , Martinez, Ma. Angelica Mar

A 21-year old woman, G1P0, was referred for further prenatal check-up with sonographic examination revealing conjoined twins at 29 weeks age of gestation. The fetuses were in breech presentation positioned face-to-face with fusion at the level of the thoraces and gastric bubble suggestive of thoracoomphalopagus twins. There was a definite communication between the two fetal circulations at the ventricular level as seen on fetal echocardiogram with a single cardiac rhythm shared between the two hearts. Close antenatal and fetal surveillance was done during the entire pregnancy duration. The patient was counseled about therapeutic options and explained of the complexity of their cardiac anatomy. The twins were delivered by cesarean section at 35 weeks due to preterm labor and a neonatal 2D-echocardiogram was done shortly after to re-assess their cardiac anatomy. Since the results revealed a shared ventricle, the twins were considered inseparable. The family was apprised of their poor prognosis and opted for natural death to occur. **(Author's abstract)**

Keywords: *Thoracoomphalopagus twins, Conjoined twins, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 40 Issue No. 1, 43-48
2016 March,
(Filipiniana Analytics)
NP

0505

Hemophilia B in a Female Adolescent: A Case Report

Balete, Ma. Susan C. , Nayal, Joanna France

Hemophilia is a relatively rare bleeding disorder. It is an X-linked hereditary bleeding disorder caused by a deficient or defective coagulation factor VIII (Hemophilia A) or factor IX (Hemophilia B). Hemophilia A is more common than Hemophilia B. The X-linked inheritance pattern results in men expressing the disease and women typically being carriers. Under rare circumstances a woman can also show a bleeding phenotype.

A 13 year-old female presented with profuse vaginal bleeding. She had history of several hospital admissions because of bleeding manifestations like hematuria and epistaxis. Based on the pedigree analysis and results of factor IX assay tests she was diagnosed to have Hemophilia B of moderate severity. She was given hormonal and non-hormonal treatments as well as blood transfusions which stop the bleeding and corrected the anemia. A

multidisciplinary approach of management involving the gynecologist, hematologist and a geneticist will be beneficial to the patient.

The inheritance, clinical manifestations, diagnosis and treatment of Hemophilia B in a female adolescent are discussed. **(Author's abstract)**

Keywords: *Hemophilia B, Lyonization, Abnormal uterine bleeding in adolescents, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 38 Issue No. 4, 31-43
2014 December,
(Filipiniana Analytics)
NP

0506

Herlyn Werner Wunderlich syndrome: A report of two cases

Alensuela, Anna Belen I., Munoz Morante, Catherine

The association of renal agenesis with ipsilateral blind hemivagina and uterus didelphys as Herlyn-Werner-Wunderlich (HWW) syndrome. Presented herein are two cases of HWW syndrome, each with different set of clinical presentation both with the same arranged diagnostic method and management executed. The first case, a 15 year-old nulligravid, manifested severe dysmenorrhea since menarche and is worsening over the past months. On the other hand, the second case, a 29 year-old Gravida 1 Para 0 (0010), exhibited cyclic hypogastric pain and gradually enlarging right pelvic mass. Both cases underwent computed tomography scan and ultrasound examination which revealed uterine didelphys, hemivagina obstruction and ipsilateral renal agenesis, yet each has different laterality of mullerian anomaly. Together were managed with full resection of the vaginal septum as well as drainage of the hematometocolpos, which are, today, the main treatment for patients with HWW syndrome. **(Author's abstract)**

Keywords: *Herlyn-Werner-Wunderlich syndrome, Blind hemivagina, Uterus didelphys, Hematometocolpos, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 39 Issue No. 2, 33-38
2015 June,
(Filipiniana Analytics)
NP

0507

Histologic Transformation in an EGFR-Mutant Lung Cancer in a Filipino Patient treated with Afatinib: A Case Report and Review of Literature

Tamayo, Steffanie Charlyne

We report a case of a 64-year-old Filipino male who initially presented with chronic cough, easy fatigability, and weight loss. Work-ups lead to a diagnosis of lung adenocarcinoma with epidermal growth factor receptor (EGFR) exon 19 deletion. Patient was placed on targeted therapy with Afatinib. He was able to complete 17 months of targeted therapy with relatively stable disease before experiencing recurrence of easy fatigability. Work-ups then lead to a diagnosis of a high-grade neuroendocrine tumor consistent with small cell lung carcinoma (SCLC). Afatinib was then discontinued and the patient was started on Carboplatin and Etoposide. However, after only one cycle, the patient's symptoms progressed and the patient eventually expired. Histological transformation of EGFR-mutant adenocarcinoma to SCLC as a mechanism of resistance to targeted therapy has been documented in literature since 2006. However, to our knowledge, this is the first fully-documented case of histologic transformation occurring in a Filipino patient. As molecular targeted therapy and immunotherapy become

standard-of-care in our country, it is of paramount importance that clinicians and pathologists are aware of the various mechanisms of resistance that can occur as a result of these treatments.

Keywords: lung cancer, adenocarcinoma, small cell carcinoma, receptor, epidermal growth factor, cell transformation, neoplastic, Medicine

Philippine Journal of Pathology, Volume No. 4 Issue No. 2, 43-47
2019,
(Filipiniana Analytics)

0508

Hoku Cryokinetics for the Reduction of Labor Pain in the Active Phase of Labor

Alforque, Jose Mari Louis , Elizon, Lagrimas G. , Ysmael, Fleoy T. , Bejoc, Jill

The study investigated the use of ice massage (cryokinetics) to reduce a woman's perception of labor pain. After thorough peer review and approval of the conduct of the study, this non-equivalent, one-group-pretest-posttest design was instituted among 30 primigravid Cebuano women, 20-30 years old, 37-42 weeks age of gestation, with fetus in cephalic presentation and who had reached the active phase of labor while being admitted in a Department of Health-accredited birthing center. The study utilized a 100-mm Visual Analog Scale (VAS) to numerically measure pain levels before and after using ice the massage (100 grams slashed ice) on the left and right hand, respectively. The findings indicated significant pain reduction for both the left and the right hand. Moreover, cryokinetics on the left Hoku point yielded the same analgesic effect as that on the right. The results suggest that ice massage on either hand is a cost-efficient, safe, non-invasive, non-pharmacologic and effective method of reducing labor pain. **(Author's abstract)**

Keywords: Primigravid, Hoku cryokinetics, Active phase of labor, Reduction of labor pain, VAS, VAPS, Medicine

CNU Journal of Higher Education, Volume No. 5 Issue No. 1, 112-124
2011,
(Filipiniana Analytics)
NP

0509

Human chorionic gonadotropin surveillance in hydatidiform mole: A need for reevaluation

Soriano-Estrella, Agnes L. , Mendoza, Marie Christine Valerie R., De Quiros, Melissa Lourdes

Introduction: Serial beta human chorionic gonadotropin (β hCG) monitoring after molar evacuation is advised for early detection of persistent trophoblastic disease. The aim of this study was to determine the percentage of patients who developed post-molar gestational trophoblastic neoplasia during a 6-month follow up period after normalization of β hCG titers to that during a 12-month follow up period in order to ascertain the appropriate period of β hCG surveillance for patients who underwent treatment for molar pregnancy.

Methods: Data was analyzed from the Section of Trophoblastic Diseases at the Philippine General Hospital - Department of Obstetrics and Gynecology to estimate the incidence of persistent trophoblastic disease among 258 women with molar pregnancy from 2000-2011.

Results: Among the 258 registered hydatidiform mole patients, 205 patients (79.5%) attained normal β hCG titers after evacuation of molar products. There was no occurrence of postmolar gestational trophoblastic

neoplasia among patients who achieved normalization of β hCG titers after treatment. β hCG levels did not attain normalization following evacuation in 53 patients (20.5%). Out of the 53 patients, 50 patients (94.3%) were detected to have gestational trophoblastic neoplasia within the first six months post-treatment. Only 3 patients (5.7%) were determined to have disease progression after six months during the one-year follow-up period.

Conclusion: The follow-up period after a molar pregnancy may be reduced for patients whose serum β hCG levels spontaneously decline to normal levels after evacuation. The results of this study showed that the median time to obtaining normal β hCG levels is 88 days for those who received chemoprophylaxis and 85 days for those with lower initial β hCG values (less than 100, 000 mIU/ml). **(Author's abstract)**

Keywords: *Human chorionic gonadotropin, Hydatidiform mole, Surveillance, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 3, 11-16
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(Filipiniana Analytics)
NP

0510

Hypermetabolism of glutathione, glutamate and ornithine via redox imbalance in methylglyoxal-induced peritoneal injury rats
Hirahara, Ichiro , Kusano, Eiji , Jin, Denan , Takai, Shinji

Peritoneal dialysis (PD) is a blood purification treatment for patients with reduced renal function. However, the peritoneum is exposed to oxidative stress during PD and long-term PD results in peritoneal damage, leading to the termination of PD. Methylglyoxal (MGO) contained in commercial PD fluids is a source of strong oxidative stress. The aim of this study was to clarify the mechanism of MGO-induced peritoneal injury using metabolome analysis in rats. We prepared peritoneal fibrosis rats by intraperitoneal administration of PD fluids containing MGO for 21 days. As a result, MGO-induced excessive proliferation of mesenchymal cells with an accumulation of advanced glycation end-products (AGEs) at the surface of the thickened peritoneum in rats. The effluent levels of methionine sulfoxide, an oxidative stress marker and glutathione peroxidase activity were increased in the MGO-treated rats. The levels of glutathione, glutamate, aspartate, ornithine and AGEs were also increased in these rats. MGO upregulated the gene expression of transporters and enzymes related to the metabolism of glutathione, glutamate and ornithine in the peritoneum. These results suggest that MGO may induce peritoneal injury with mesenchymal cell proliferation via increased redox metabolism, directly or through the formation of AGEs during PD. **(Author's abstract)**

Keywords: *Glutaminolysis, Glutathione, Methylglyoxal, Peritoneal dialysis, Redox, Medicine*

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(Filipiniana Analytics)
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0511

Idiopathic central precocious puberty: A case report
Dichoso, Marian C. , dela Rea, Mariel A

Central precocious puberty is characterized by early pubertal changes, acceleration of growth velocity, and rapid bone maturation. It is a relatively rare disorder, with an incidence rate of about 1 : 5000 – 1 : 10 000 individuals in the general population; it is more frequent in girls than in boys. This is a case of a 7 year-old female complaining of onset of menstruation. Physical examination revealed advanced pubertal changes of Tanner stage 4-5 for breast

and stage 3 for pubis. Diagnostic evaluation revealed well developed internal genitalia, markedly elevated LH levels, advanced bone aging and a normal cranial MRI. Based on clinical and diagnostic evaluations, a diagnosis of idiopathic central precocious puberty was made and the patient was started on GnRHa therapy. It is important to initiate therapy early in patients with central precocious puberty so as to prevent compromised adult height and psychosocial embarrassment. **(Author's Abstract)**

Keywords: *Precocious puberty, Central precocious puberty, Idiopathic central precocious puberty, Medicine*

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NP

0512

Interleukin-6 confers radio-resistance by inducing Akt-mediated glycolysis and reducing mitochondrial damage in cells

Kumari, Neeraj , Das, Asmita , Bhatt, Anant Narayan

Interleukin-6 (IL-6)-induced glycolysis and therapeutic resistance is reported in some cell systems; however, the mechanism of IL-6-induced glycolysis in radio-resistance is unexplored. Therefore, to investigate, we treated Raw264.7 cells with IL-6 (1 h prior to irradiation) and examined the glycolytic flux. Increased expression of mRNA and protein levels of key glycolytic enzymes was observed after IL-6 treatment, which conferred glycolysis dependent resistance from radiation-induced cell death. We further established that IL-6-induced glycolysis is activated by Akt signalling and knocking down Akt or inhibition of pan Akt phosphorylation significantly abrogated the IL-6-induced radio-resistance. Moreover, reduction of IL-6-induced pAkt level suppressed the expression of Hexokinase-2 and its translocation to the mitochondria, thereby inhibiting the glycolysis-induced resistance to radiation. IL-6-induced glycolysis also minimized the radiation-induced mitochondrial damage. These results suggest that IL-6-induced glycolysis observed in cells may be responsible for IL-6-mediated therapeutic radio-resistance in cancer cells, partly by activation of Akt signalling. **(Author's abstract)**

Keywords: *Akt signalling, Glycolysis, Hexokinase-2, IL-6, Radio-resistance, Medicine*

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0513

Intracervical foley catheter balloon versus oxytocin infusion as pre-induction cervical ripening agent in live term pregnancies with unfavorable cervixes

Villareal-Fortaleza, Angelica , Castillo-Celabradros, Chariss

Objective: The purpose of this study was to evaluate the effectiveness and safety as well as maternal and fetal outcome of intracervical Foley catheter balloon versus oxytocin infusion as pre-induction cervical ripening agents in live term pregnancies with unfavorable cervixes.

Methods: Forty-two patients who fulfilled the induction criteria were randomized to 2 groups. Group 1= intracervical balloon catheter and Group 2 =oxytocin infusion. Both groups were compared as to: insertion/infusion to active phase interval, induction to delivery interval, uterine hyperstimulation, pain intensity, delivery and fetal outcome. Analysis of data collected was done using Independent T-test.

Results: Statistical analysis showed no significant difference as to insertion/infusion to active phase interval (p 0.814) and induction to delivery interval (p 0.264) between the balloon and oxytocin groups. By percentage comparison, both groups have comparable results in the mode of delivery, likelihood of cesarean section and good fetal outcome. Statistical significance was observed with regards to absence of uterine hyperstimulation (p 0.036) and absence of pain (p 0.000) in favor of the balloon group.

Conclusion: By percentage comparison, intracervical Foley catheter balloon and oxytocin were both effective and safe in achieving cervical dilatation. The Foley catheter showed statistical significance in terms of absence of uterine hyperstimulation and pain. Foley catheter is readily available and affordable. It may be considered as a good alternative to oxytocin. **(Author's abstract)**

Keywords: *Cervical ripening, Foley catheter, Induction of labor, Oxytocin, Medicine*

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NP

0514

Intramyometrial Oxytocin in Preventing Postpartum Hemorrhage during Cesarean Delivery: A Systematic Review

Gonzaga, Florante P., Guerra-Calilung, Joanna Ma

Background: Postpartum hemorrhage from uterine atony, a major global and local health burden, remains to be a leading cause of maternal mortality. Intravenous oxytocin infusion has become the conventional first-line drug in the active management of third stage of labor in most countries. This, however, has been associated with refractory uterine atony and major hemodynamic side effects; hence the need to explore on the possibility of a better alternative such as intramyometrial oxytocin administration.

Objective: The study aims to evaluate the efficacy and safety of intramyometrial oxytocin in preventing postpartum hemorrhage during cesarean deliveries.

Methods: A review was done involving electronic search of databases for randomized clinical trials published since 1980, and a check of all the references according to inclusion and exclusion criteria. Four full articles were retrieved and assessed for methodological quality. Data were extracted and analyzed.

Results: Comparisons involved (1) intramyometrial versus intravenous oxytocin, and (2) intramyometrial oxytocin against intramyometrial carboprost. Limited evidence showed significant reduction of postpartum hemorrhage (RR 0.40; 95% CI 0.19 to 0.82) and maternal adverse drug events (RR 0.10; 95% CI 0.01 to 0.75) with intramyometrial oxytocin compared to intravenous oxytocin. Maternal adverse events were reduced, but not significantly, in intramyometrial oxytocin compared with intramyometrial carboprost.

Conclusion: Guideline changes could not be recommended because there is insufficient information about intramyometrial oxytocin administration from the small number of studies and participants available. **(Author's abstract)**

Keywords: *Intramyometrial, Myometrial oxytocin, Cesarean section, Prophylaxis, Postpartum hemorrhage, Uterine atony, Medicine*

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NP

Isolation of colony forming bacteria in different water refilling stations in Davao City
Ortiz, Kate Licca T. , Soriano, Jazmine P. , Muyco, Renyll Joy S. , Gepolio, Queenie Dianne M. , DaÃ±o, Mary Angela M. , Alcantara, Nestle John E. , Catalan, Marx P. , Parantar, Klara Pelissa C. , Ypanto, Rico Ja

Safe drinking water is essential to humans and other lifeforms even though it provides no calories or organic nutrients. Although access to safe drinking water has improved in almost every part of the world, approximately one billion people still lack access to safe water and over 2.5 billion lack access to adequate sanitation. Today most households are using purified water purchased from water purification and refilling stations because of their promise of clean, and microbefree drinking water. This study aimed to detect and identify possible microbial contamination in water from water refilling stations in Davao City. A quantitative and descriptive design was used to determine the presence of microbial contamination and evaluate the microbial load of the water samples using standard laboratory procedures such as water bacteriology and heterotrophic plate count. Results of the heterotrophic plate count showed that the microbial load was less than the standard countable range (30-300cfu/ml) to be considered non-potable. For the determination of total coliforms, all the test tubes yielded negative results. These results indicated that the water refilling stations in Davao City provided clean and potable drinking water to consumers. **(Author's abstract)**

Keywords: *Medicine*

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 NP

JUND-dependent up-regulation of HMOX1 is associated with cisplatin resistance in muscle-invasive bladder cancer

Peng, Ye , Chen, Yongjie , Chen, Shiwei , Wang, Jiaolian , Jiang, Cheng , Hou, Wugang , Xu, Chun

The standard-of-care for metastatic muscle-invasive bladder cancer (MIBC) is platinum-based chemotherapy regimens. Acquired resistance that occurs frequently through unidentified mechanisms, however, remains the major obstacle for implementing therapeutic effectiveness. Here, using data mining and analysis on clinical samples, we show that expression of JUND, a core component of activator protein-1 family, was significantly induced in cisplatin (CDDP)-resistant MIBC. Accumulation of nuclear JUND was associated with low post-chemotherapy survival in MIBC patients. In both genetically engineered cell models and murine xenograft models, we provided evidence that bladder cancer (BC) cells with excessive JUND expression were less responsive to CDDP treatment. This CDDP resistance was further demonstrated to be mediated, at least in part, by transactivation of HMOX1 [the gene encoding heme oxygenase-1 (HO-1)], one of the most important antioxidant signalling pathways of cell adaptation to stress. One mutation within the HMOX1 promoter successfully abolished oxidative stress-enhanced and JUND-driven HMOX1 promoter activation, suggesting that this unique site synergized for maximal HO-1 induction in CDDP-challenged BC cells. Overall, our data highlight an indispensable role of JUND, both as a target as a modifier of the oxidative stress signalling, in conferring an adaptive response during the pathogenesis of CDDP resistance in MIBC. **(Author's abstract)**

Keywords: *Cisplatin (CDDP), Heme oxygenase-1 (HO-1), JUND, Muscle-invasive bladder cancer (MIBC), Transcriptional regulation, Medicine*

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Juvenile granulosa cell tumor of the ovary presenting as isosexual precocious puberty:

A case report

Soriano-Estrella, Agnes L. , Tingne, Cyriel Anth

Isosexual precocious puberty is rare and a thorough investigation must be done in order to identify the cause of the precocity. This paper presents the case of a 4 year-old girl who was brought to the emergency room due to vaginal bleeding associated with onset of secondary sexual characteristics. Estradiol and anti-mullerian hormone levels were elevated. Abdominal ultrasound revealed an abdominopelvic mass probably an ovarian new growth with benign sonologic features. Computer tomography of the brain with contrast showed normal findings. Elective surgery was planned after correction of the anemia and other causes of precocious puberty were excluded. She underwent an exploratory laparotomy and left salpingoophorectomy with frozen section. Final histopathology report showed juvenile granulosa cell tumor of the left ovary. **(Author's abstract)**

Keywords: *Juvenile granulosa cell tumor, Precocious puberty, Ovarian tumor, Pediatric endocrinology, Medicine*

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Knowledge, attitude, and practice on human papillomavirus vaccination among obstetrics and gynecology residents in Metro Manila

Benavides, Doris R. , Decena, Katrina Immacul

Background: Human Papilloma Virus (HPV) has been known to be an important factor in the development of cervical cancer. In 2006, two vaccines were made available in the Philippines, one covering two subtypes (HPV 16 and 18) and the other covers four subtypes (HPV 6, 11, 16 and 18) of the virus.

Objectives: This study aimed to determine the current knowledge, attitude, and practices of obstetrics and gynecology residents from both government and private sector regarding HPV vaccination as well as determine barriers to vaccination. It also aimed to determine if there is any disparity between the private and government setting, and between residency year levels which may create a discrepancy in the vaccination coverage of their patients.

Methods: Data will be collected through a self-administered questionnaire. The survey to be used in this study was adapted from the form used in a similar study done in Hong-Kong. The questionnaire will consist of five sections: 1) items regarding the respondents' demographics (age; sex; institution type; residency training year level; number of patients seen in a typical week; number of patients seen in a week aged 10-17, 18-26, and 27-45; number of pap smears performed in a typical week), 2) Knowledge on human papillomavirus infection, 3) Attitude towards HPV vaccine, 4) HPV vaccination practice, and 5) Perceived barriers in HPV vaccination.

Results: This study found that the knowledge of residents about human papilloma virus was generally poor to fair with no significant difference between the knowledge of residents from government institutions compared to those from the private sector. Majority of the residents believe that the vaccine should be administered to 10-17 years old, prior to sexual debut and exposure to the human papilloma virus but were not able to prescribe vaccination for this age group. The perceived barriers of residents in prescribing and vaccinating their patients differ between age groups. For 10-17 years old, parental refusal for vaccinating their children is due to the notion that in doing so, their child is being singled out as being at risk for sexually transmitted diseases. For patients 18-26 years old,

residents believe that their reluctance to discuss and talk about issues of sexuality are likely to hinder them from getting vaccinated. For the 27-45-year-old age group, the residents believe that the patient's belief that they do not have HPV infection is likely to hinder them being vaccinated.

Conclusion: Proper education and good communication skills among residents and patients should be developed to properly employ and promote vaccination. **(Author's Abstract)**

Keywords: *Human Papilloma Virus, HPV vaccination, Cervical Cancer, Medicine*

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0519

Laparoscopically Resected Venous Adventitial Cystic Disease that was Difficult to Distinguish from an Ovarian Tumor

Shota Higami, Ueda, Taeko, Sakakibara, Yu, Tohyama, Atsushi, Harada, Hiroshi, Kurita, Tomoko, Kagami, Seiji, Matsuura, Yusuke, Yoshino, Kiyoshi

Adventitial cystic disease (ACD) is a rare condition in which a mucinous cyst forms within the adventitia, usually in arteries but rarely in veins. A 79-year-old patient presented with stomachache and nausea. Computerized tomography showed pelvic cysts on either side of the pelvis. The right tumor was 120×100 mm, and the left tumor was 45×35 mm. Our diagnosis was bilateral ovarian tumors and we performed laparoscopic tumor resection. In the abdominal cavity, we saw that the left ovary was swollen by about 3–4 cm and the right ovary was normal size. There was a mucous cyst located in the right retroperitoneal cavity that adhered around and bordered the right external iliac vein and the right obturator nerve. We peeled the adhesion away carefully and resected the tumor but the operation caused temporary obturator nerve paralysis. From pathological examination, we diagnosed the right retroperitoneal cyst to be venous ACD originating from the right external iliac vein. We found that venous ACD can grow as large as a pelvic tumor and is difficult to distinguish from an ovarian tumor, which is why we chose laparoscopic surgery. In this case, we performed the operation laparoscopically and no sequelae or recurrent tumor appeared during a 1-year follow-up. However, graft replacement is sometimes necessary for ACD, thus venous ACD should be considered a differential diagnosis and a surgical strategy should be developed when pelvic tumors are observed. **(Author's abstract)**

Keywords: *Medicine, Adventitial cystic disease, External iliac vein, Ovarian tumor, Laparoscopic surgery*

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0520

Larvicidal potential of rambutan (*Nephelium lappaceum* L.) leaf extract against household mosquito larvae

Nullar, Cressa Mae C., Mondano, Alvin T., Cosido, Sharmaine G., Demanarig, Carlo Hereco Mari H., Durano, Lourivy P., Muña, Cherrie G., Baula, Ferlien Mae G., Morales, Vina

Mosquito borne diseases are detrimental to human health; thus, researchers are constantly conducting studies on how to reduce the number of mosquito borne pathogen. The study was conducted to verify the larvicidal effect of rambutan (*Nephelium lappaceum* L.) leaf extract against larvae of household mosquito. Qualitative screening of

tannin and saponin was done by phytochemical testing. Ethanol extraction and rotary evaporation were performed to obtain the extract. An experimental set-up/larvicidal assay was conducted to determine the effectiveness of the extract as larvicidal agent. The approximate effective concentration of rambutan leaf extract against mosquito larvae obtained from the study was 0.005 showing a death of 84%. To measure the standard toxicity of Rambutan leaf extract against mosquito larvae, the LC₉₀ was computed using the probit y analysis. In this test, the toxicity of the experimental plant extract was computed allowing 90% death of the test larva population. The bioassay analyses of rambutan leaf extract as larvicidal agent has mean death percentage of 91.33. The study concluded that the ethanolic leaf extract of rambutan can be used as a mean of terminating the growth and development of the larvae of household mosquito and control the increase of population of this biological vector. **(Author's abstract)**

Keywords: *Clinical laboratory analysis, Larvicidal effect, Nephelium lappaceum L., Tannin, Saponin, Phytochemical testing, Rotary evaporation, LC90, Bioassay analyses, Philippines, Medicine*

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NP

0521

“Hairy potty” Ovarian dermoid cyst with fistula to bladder

Rivera, Alma Bella G. , Deterala, She

Dermoid cysts are usually asymptomatic until complications occur. Spontaneous rupture of a dermoid into an adjacent organ is a rare complication and no such case has been reported in the Philippines.

A 24-year-old primipara consulted for pilimiction. Three years earlier, she had recurrent urinary tract infection and was diagnosed to have a dermoid cyst. Left untreated, the cyst grew in size and urinary symptoms worsened. Ultrasound, CT scan and subsequent laparotomy revealed that the dermoid cyst has penetrated the bladder wall resulting to fistula formation between the dermoid and the urinary bladder. Hair and sebum were seen inside the bladder. A left salpingo-oophorectomy and partial cystectomy of the urinary bladder were done.

The first locally documented case of an ovarian dermoid cyst with fistula to the bladder is presented. A review of literature is made, the predisposing factors, possible cause, diagnosis and management are discussed. **(Author's abstract)**

Keywords: *Dermoid cyst, Primipara, Pilimiction, Fistula, Salpingo-oophorectomy, Cystectomy, Medicine*

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0522

Lead levels in the blood specimens of painters in Davao City determined using atomic absorption spectrometry

Munar, Ruben Jr. M. , Labarinto, Febriz Marie D. , Duenas, Bernadette O. , Alinsugay, Janica J. , Ahig, Kristine Jeal A. , Aya-ay, Ador

Lead is known as an environmental toxicant present in air and is most commonly used in car batteries, ammunition, and paints. It causes variety of serious health problems. Lead poisoning can build up slowly and occurs from repeated exposure to small amounts. Health problems get more severe as the level of lead in the blood

gets higher. The Occupational Safety and Health Administration (OSHA) set the exposure limit of inorganic lead at 0.05ppm. This study determined the lead levels in the blood specimen from selected painters in Davao City. Twenty four painters were randomly selected from different groups or organizations. Criteria for the selection of respondents include history of smoking cigarettes and number of years serving as painters in establishments. Blood samples from the respondents were collected using a syringe, digested, and tested using flame atomic absorption spectrometry. The results obtained showed no significant difference in the lead levels of the painters between smokers and non-smokers ($p > 0.05$). Furthermore, there is no significant difference in the lead median lead level of painters of 7.581ppm is significantly higher than the tolerable limit set by OSHA which is 0.05 ppm ($p < 0.05$). **(Author's abstract)**

Keywords: *Toxicology, Lead, Painters, Flame atomic absorption spectrophotometry, Philippines, Medicine*

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0523

Level of knowledge and clinical experience on basic nursing skills among UIC nursing students in hospitals: A basis for curriculum review

Alfornon, Fretzelee, San Juan, Mila Grace C., Gaspar, Charity Leene S., Velos, Jessa Pearl

This investigation regarding the level of knowledge and clinical experience on basic nursing skills among nursing students of University of the Immaculate Conception (UIC) undergoing clinical training in hospitals, evaluated theory-practice gap among nursing students as basis for theoretical input in schools and enhancement of skills during hospital exposures. Furthermore, it determined how nursing students apply theoretical inputs in clinical exposures. Quantitative descriptive-correlation research design and standardized questionnaire were employed to gather information from nursing students undergoing clinical training in affiliated hospitals. Two sets of respondents include twenty five students from old nursing curriculum and thirteen from new curriculum. Results showed significant relationship between level of knowledge and clinical experience among UIC nursing students. It revealed that nursing students from old curriculum were highly knowledgeable compared to students in new curriculum. However, students in old and new curriculums were shown to have highly satisfactory clinical experience in actual clinical setting. Theory practice gap was evident, as supported by weak correlations of level of knowledge and clinical experience of old and new curriculums. In this, factors are to be investigated that would influence the outcome of this study. Hence, curriculum change in nursing program satisfied minimum requirements essential to student nurses' clinical experience. **(Author's abstract)**

Keywords: *Nursing students, Clinical exposure, Knowledge, Clinical experience, Basic nursing skills, Curriculum review, Philippines, Medicine*

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NP

Level of satisfaction on delivered nursing care and level of functioning among geriatric patients in a local geriatric facility

Trangia, Helen Grace L. , Mondejar, January Faith Real D. , Delos Santos, Nova Lee D. , Gaspar, Charity Leene S. , San Juan, Mila Gr

Due to increasing geriatric patients, quality care must be provided by healthcare professionals to satisfy their needs in the level of functioning. Researchers determined the levels of functioning and satisfaction on nursing care among geriatrics and assessed the significance of their relationship through a descriptive correlation study. Respondents were fifteen geriatric residents of a facility in research locale. Validated questionnaires and perception assessment forms were utilized in gathering data on demographic profile, physical functioning, personal care skills, interpersonal relationship and social acceptability. Demographic profiling of respondents revealed that majority were 61- 73 years old, married, female, college graduate and of high-income. Physical functioning was problematic. Furthermore, physical assistance with personal care was needed and the interpersonal relationship of geriatric patients was typical of the person. On social acceptability, data revealed that they were not abusive to themselves or to others. Level of satisfaction on nursing care in meeting physiological, psychological and social needs were moderately satisfactory. The study also revealed no significant relationship between their level of functioning and satisfaction on nursing care. Also, there was no significant difference in their level of functioning and satisfaction when grouped according to gender and civil status. However, there is a significant difference in level of functioning and satisfaction when respondents were grouped according to age. **(Author's abstract)**

Keywords: *Nursing, Geriatric patients, Level of satisfaction, Nursing care, Level of functioning, Descriptive-correlation, One-way ANOVA, Pearson-r, Philippines, Medicine*

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2015,
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Levels of cadmium, copper and lead in blood samples from banana plantation workers in Tagum City

Sereñ±o, Quennie Rose T. , Rotersos, Gen Lace D. , Amacna, Vincent Billy D. , Abarilla, Marie Kerstien C. , Aya-ay, Adorico M., Toledo, Anna Louella

The trace elements cadmium, copper, and lead have caused major human health problems in several parts of the world. Concerns over such incidents have prompted numerous investigations into the metabolism and toxic effects of these three toxic and harmful trace elements. Cadmium, copper and lead are usually used for industrial purposes and they are the major ingredients in certain products such as paints, fertilizers and cigarettes. Banana plantation farmers are usually exposed to different chemicals which make them highly susceptible to exposure of these harmful heavy metal elements. A prospective descriptive-quantitative design was utilized in the determination of the levels of cadmium, copper and lead in blood samples from banana plantation workers in Cuambagan, Tagum City. Thirty-five farmers aged between 19-46 years old were randomly selected. Blood samples were collected and tested using flame atomic absorption spectrophotometer. Results of the study showed that the banana plantation workers with the age range of 42-48 years old have the highest mean level of cadmium (0.33ppm) and copper (0.79ppm). Lead levels were high in age-group 31-36 years old with the highest mean level of 6.51ppm. These values were considerably high and have exceeded the tolerable level established by the Occupational Safety and Health Hazard. **(Author's abstract)**

Keywords: *Toxicology, Trace elements, Banana plantations, Farmers, Flame atomic absorption spectrophotometry, Philippines, Medicine*

LncRNA MEG3 inhibits the progression of prostate cancer by facilitating H3K27 trimethylation of EN2 through binding to EZH2

Zhou, Yaojun , Yang, Hongqiong , Xia, Wei , Cui, Li , Xu, Renfang , Lu, Hao , Xue, Dong , Tian, Zinong , Ding, Tao , Cao, Yunjie , Shi, Qianqian , He, Xiaozhou

This study aims to study the effects of intra-nuclear lncRNA MEG3 on the progression of prostate cancer and the underlying mechanisms. Expressions of relative molecules were detected by Quantitative real time PCR (qRT-PCR) and western blot. Chromatin immunoprecipitation and RNA immunoprecipitation (RIP) assays were used to evaluate the interaction between intra-nuclear MEG3, histone methyltransferase EZH2 and Engrailed-2 (EN2). The impacts of MEG3 on the viability, proliferation and invasion of prostate cancer cells (PC3) were evaluated by methyl thiazolyl tetrazolium, colony formation and transwell assays, respectively. PC3 cells were transfected with MEG3 and transplanted into nude mice to analyse the effect of MEG3 on tumourigenesis of PC3 cells in vivo. EN2 expression was inversely proportional to MEG3 in the prostate cancer tissues and PC3 cells. RIP results showed that intra-nuclear MEG3 could bind to EZH2. Knockdown of MEG3 and/or EZH2 up-regulated EN2 expression and reduced the recruitment of EZH2 and H3K27me3 to EN2, while over-expressed MEG3 caused opposite effects. MEG3 over-expression suppressed cell viability, colony formation, cell invasion and migration of PC3 cells in vitro and inhibited tumourigenesis of PC3 cells in vivo, while EN2 over-expression diminished the effects. These findings indicated that MEG3 facilitated H3K27 trimethylation of EN2 via binding to EZH2, thus suppressed the development of prostate cancer. **(Author's abstract)**

Keywords: *Quantitative real time PCR (qRT-PCR), LncRNA MEG3, Chromatin immunoprecipitation, RNA immunoprecipitation, Medicine*

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Local versus International Criteria in Predicting Gestational Diabetes Mellitus-Related Pregnancy Outcomes

Tremedal, Ma. Asuncion , Espina-Tan, Charisse , Serafica-Hernandez, Shalimar A., Diaz-Roa, Larisa J

Objective: To evaluate the Philippine Obstetrical and Gynecological Society Clinical Practice Guidelines (POGS-CPG) and the International Association of Diabetes and Pregnancy Study Group (IADPSG) diagnostic criteria for gestational diabetes mellitus (GDM) against pregnancy outcomes.

Methods: This is a randomized controlled trial which enlisted patients attending the Out-patient clinic of our institution. All women included in the study were requested to take a 2-hour 75-gram oral glucose tolerance test (OGTT) between estimated 24th and 28th gestational weeks. In order to diagnose GDM, POGS-CPG consensus required a fasting plasma glucose of ≥ 92 mg/dl (5.1 mmol/L) or a 2-hour post-glucose load of ≥ 140 mg/dl (7.8 mmol/ml) while IADPSG criteria required 92 mg/dL (5.1 mmol/L) for fasting plasma glucose, 180 mg/dL (10 mmol/L) 1-hour post-glucose load, or 153 mg/dL (8.5 mmol/L) 2-hour post-glucose load. Only 1 abnormal value on the OGTT is needed on both criteria to diagnose GDM. Women with diabetes antedating pregnancy were

excluded in this study. Based on the 75-g OGTT result, the patients were divided into 4 groups and were followed through delivery. Pregnancy outcomes of the 4 groups were then compared.

Results: Among the 389 patients studied, POGS-CPG group had a GDM prevalence rate of 29% whereas the IADPSG group had 16%. Trends have shown that in patients diagnosed with GDM under IADSGP and POGS criteria, no significant differences in the birthweight status ($p=0.156$), mode of delivery ($p=1.000$), indication of cesarean section ($p=1.000$), and other complications ($p=1.000$) were noted. The 75 g OGTT values of patients in both groups were not significant predictors of APGAR scores. However, the 1-hour post-glucose load value was shown to be a significant predictor of birthweight. Yet, the regression models of FBS parameters in predicting APGAR scores and birthweight were still weak.

Conclusion: There was no significant difference noted between the IADPSG group versus the POGS-CPG group in terms of maternal and neonatal outcome. **(Author's abstract)**

Keywords: *Gestational Diabetes Mellitus, 75 grams OGTT, IADPSG criteria, Medicine*

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NP

0528

Malaria Risk Factors in Banjarnegara, Indonesia: A Matched Case-Control Study *Sulistyawati, Sulistyawati, Rokhmayanti Rokhmayanti, Fatmawati, Fajar*

Malaria is a matter of concern in public health worldwide. Identifying its risk factors is essential to determine control efforts. We studied the potential environmental and human behaviour risk factors in malaria by a matched case-control study conducted in the Banjarmangu I Public Health Centre area, Banjarnegara, from June to August 2018. A structured questionnaire and checklist were employed to collect data from 50 participants. Data were analysed by Chi-Square, Fisher exact and logistic regression. A positive association was found between malaria and not sleeping under bed mosquito netting (OR=2.087 [95% CI: 1.148 – 3.795]), not using wire netting in the house ventilation (OR = 3.907 [95% CI: 0.647 – 24.452]), and inadequate prevention practices during outdoor activities (OR = 2.020 [95% CI: 1.033 – 3.953]). These three factors were identified as independent risk factors for malaria. **(Author's abstract)**

Keywords: *Malaria, Risk factors, Environmental, Behaviour, Indonesia, Medicine*

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0529

A meta-analysis on the efficacy of carboprost versus methylergometrine maleate in the active management of third stage of labor for the prevention of postpartum haemorrhage *Pangilinan, Nelinda Catherine B. , Vivar, Jo*

Objective: To determine the efficacy of Carboprost versus methylergometrine maleate in the active management of third stage of labor for the prevention of postpartum hemorrhage.

Methods: Entries in electronic databases with references cited in original studies and review articles were used to identify randomized clinical trials of carboprost versus methergin in the active management of third stage of labor. The quality of published clinical trials were evaluated and assessed based on the efficacy of Carboprost versus methylergometrine maleate for the prevention of postpartum hemorrhage.

Results: Six (6) clinical trials were analyzed comprising a total sample pool of 525 women randomized to carboprost group and another 525 women to methergin. The risk ratio for dichotomous outcomes were calculated using a random-effects model while continuous outcomes were pooled using the standard mean difference. But carboprost was found to be more efficacious in reducing the duration and decreasing the amount of blood loss in the third stage of labor and there was less need for an additional drug dose. Risks of side effects were higher in carboprost. Vomiting is the most frequent adverse event followed by diarrhea but are usually self-limiting.

Conclusion: Carboprost is well known for its therapeutic role in the management of postpartum hemorrhage, well-tolerated and with minimal adverse effects. It is therefore recommended to be used in hypertensive patients where methylergometrine maleate is contraindicated and in cases refractory to other uterotonic agents. **(Author's abstract)**

Keywords: *Carboprost 15, Methy prostaglandin F2a, 15 methyl PGF2a, Methergin, Methylergometrine maleate, Metaanalysis, Postpartum hemorrhage, Medicine*

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NP

0530

Metachronous Primary Cerebral Rhabdomyosarcoma After Treatment of Oral Primitive Neuroectodermal Tumor/ Ewing's Sarcoma in a School-Aged Girl: A Case Report
Gonong, Danielle

Multiple primary malignancies are defined as two or three malignant neoplasms arising in different organ systems. Several cases of multiple primary malignancies are emerging in recent years due to the advancement in medical therapy and diagnostics. Multiple primary malignancies are not uncommon occurring at 0.7-16% of cancer patients, however, reported cases of multiple primary sarcomas are sparse. Presented in this report is a pediatric patient diagnosed with primary metachronous cerebral rhabdomyosarcoma after being treated for primitive neuroectodermal tumor/Ewing's sarcoma of the oral cavity. Despite limited cases addressing multiple primary sarcomas, this entity must not be overlooked as it is associated with a meager outcome compared to an index case of sarcoma alone.

Keywords: *multiple primary malignancies, multiple primary sarcomas, metachronous malignancies, PNET/ Ewing's sarcoma, rhabdomyosarcoma, immunohistochemistry, fluorescence in situ hybridization, reverse transcription-polymerase chain reaction, Medicine*

Philippine Journal of Pathology, Volume No. 5 Issue No. 2,
2020,
(Filipiniana Analytics)

Metaplastic Carcinoma with Mesenchymal Differentiation in Augmented Breast using Liquid Silicone Injection: A Case Report

Lorenzo, Lar

The relationship between the use of liquid silicone for breast augmentation and carcinogenesis remains undetermined due to limited data reported, especially regarding its risks for acquiring cancer. We documented a case of an 81-year-old woman who presented with bilateral enlarging breast masses with a known history of breast augmentation using liquid silicone. On microscopic examination, the malignancy showed both mesenchymal and epithelial components in a background of stromal changes related to liquid silicone. Based from morphology and immunohistochemistry studies (p63, CK, HMW-CK, and CK5/6, CD34, and BcL-2), this case was signed out as metaplastic carcinoma with mesenchymal differentiation. This rare case of metaplastic carcinoma with mesenchymal differentiation coexisting with liquid silicone, provides evidence supporting the link between cancer development and siliconomas.

Keywords: *Metaplastic breast carcinoma, liquid silicone, breast augmentation, invasive breast carcinoma, Medicine*

Philippine Journal of Pathology, Volume No. 5 Issue No. 2,
2020,
(Filipiniana Analytics)

MicroRNA-1323 downregulation promotes migration and invasion of breast cancer cells by targeting tumour protein D52

Xu, Yuanying, Liu, Meiyun

Breast cancer (BC) is one of the most common malignancies globally in women, with high mortality rate as a result of tumour metastasis. MicroRNAs play vital roles in the occurrence and development of human cancer. This study aimed to investigate the biological roles of miR-1323 in BC. The expression levels of miR-1323 were detected by quantitative real-time PCR assay. The effect of miR-1323 on BC cell proliferation was determined by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide and colony formation assay. Wound healing analysis and Matrigel Transwell assay were conducted to evaluate miR-1323-mediated BC cell migration and invasion. A luciferase reporter assay was used to test the target of miR-1323. We found that miR-1323 levels were downregulated in BC tissues and serums. Low-miR-1323 levels were associated with lymph node metastasis and advanced clinical stage. Tumour protein D52 (TPD52) was identified as a direct target of miR-1323. Low expression of miR-1323 contributed to the overexpression of TPD52 leading to enhanced BC progression. Our findings suggest that silencing of miR-1323 enhances BC development by regulating TPD52 expression, suggesting that miR-1323 and TPD52 may serve as potential therapeutic targets for BC treatment. **(Author's abstract)**

Keywords: *Breast cancer (BC), PCR assay, Colony formation assay, Medicine*

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2020 July,
(Filipiniana Analytics)
F(S) QP501 J82 168/1 2020

MicroRNA-191 regulates endometrial cancer cell growth via TET1-mediated epigenetic modulation of APC

Yang, Chiu Jung, Ota-Kurogi, Natsuki, Ikeda, Kazuhiro, Okumura, Toshiyuki, Horie-Inoue, Kuniko, Takeda, Satoru, Inoue, Satoshi

Endometrial cancer (EC) is a common gynecological malignancy with relatively favourable prognosis, although alternative diagnostic and therapeutic options remain to be explored for advanced disease. Recent studies enabled to apply microRNAs (miRs) to clinical cancer management as promising diagnostic and therapeutic biomarkers. We here aimed to identify proliferation-associated miRNAs and characterize their functions in EC cells. Our small RNA-sequencing analysis showed that miR-191 is abundantly expressed in HEC-1A and Ishikawa EC cells along with the high expression of miR-182, which was previously characterized as an EC proliferation-related miRNA in EC. We showed that miR-191 was upregulated in EC tissues than in adjacent normal tissues and its knockdown repressed EC cell proliferation. In silico miRNA target screening identified that ten–eleven translocation 1 (TET1) is one of the putative miR-191 targets. TET1 expression could be downregulated by miR-191 through the mRNA–miRNA interaction in the 3'-untranslated region of TET1. In line with TET1 functions as a methylcytosine dioxygenase, which removes genome-wide DNA methylation marks, decreased TET1 expression resulted in hypermethylation in the promotor region of tumour suppressor adenomatous polyposis coli. Taken together, miR-191 could function as an oncogenic miRNA in EC and serve as a prospective diagnostic and therapeutic target for advanced disease. **(Author's abstract)**

Keywords: 5-hydroxymethylcytosine, Endometrial cancer, Epigenetic regulation, miRNA-191, Ten-eleven translocation 1, Medicine

The Journal of Biochemistry, Volume No. 168 Issue No. 1, 7-14
2020 July,
(Filipiniana Analytics)
F(S) QP501 J82 168/1 2020

MicroRNA-448 targets SATB1 to reverse the cisplatin resistance in lung cancer via mediating Wnt/β-catenin signalling pathway

Ning, Mei-Ying, Cheng, Zhao-Lin, Zhao, Jing

This study aims to examine whether miR-448 reverses the cisplatin (DDP) resistance in lung cancer by modulating SATB1. QRT-PCR and immunohistochemistry were used to examine the miR-448 and SATB1 expressions in DDP-sensitive and -resistant lung cancer patients. A microarray was used to investigate the cytoplasmic/nucleic ratio (C/N ratios) of genes in A549 cells targeted by miR-448, followed by Dual-luciferase reporter gene assay. A549/DDP cells were transfected with miR-448 mimics/inhibitors with or without SATB1 siRNA followed by MTT assay, Edu staining, flow cytometry, qRT-PCR and western blotting. MiR-448 was lower but SATB1 was increased in DDP-resistant patients and A549/DDP cells. And the patients showed low miR-448 expression or SATB1 positive expression had poor prognosis. SATB1, as a target gene with higher C/N ratios (>1), was found negatively regulated by miR-448. Besides, miR-448 inhibitors increased resistance index of A549/DDP cells, promoted cell proliferation, increased cell distribution in S phase, declined cell apoptosis and activated Wnt/β-catenin pathway. However, SATB1 siRNA could reverse the above effect caused by miR-448 inhibitors. MiR-448 targeting SATB1 to counteract the DDP resistance of lung cancer cells via Wnt/β-catenin pathway. **(Author's abstract)**

Keywords: Cisplatin, Drug resistance, Lung cancer, miR-448, SATB1, Medicine

The Journal of Biochemistry, Volume No. 168 Issue No. 1, 41-51
2020 July,
(Filipiniana Analytics)

Mixed Germ Cell Tumor in Androgen Insensitivity Syndrome: A Case Report
Soriano-Estrella, Agnes L. , Villafuerte, Mary Gr

Androgen insensitivity syndrome (AIS) is a disorder of sexual development characterized by a female phenotype with a 46 XY karyotype. Most patients present with primary amenorrhea; however, 1.1 % of patients present with an inguinal mass. Most commonly, seminoma arising from the gonads are found.

This report presents the case of a 15 year-old female looking adolescent who initially presented with an abdominopelvic mass. A diagnosis of AIS was made based on the physical examination findings, endocrine profiling, imaging studies and karyotyping. She underwent cystoscopy, exploratory laparotomy, adhesiolysis, tumor debulking, frozen section, bowel run, repair of serosal tear, Jackson-Pratt drain insertion, bilateral percutaneous nephrostomy under combined spinal and epidural anesthesia. Histopathologic examination of the excised mass revealed a mixed germ cell tumor. This paper will discuss the diagnostic approach as well as the management and prognosis of patients with AIS associated with mixed germ cell tumor. **(Author's abstract)**

Keywords: *Androgen insensitivity syndrome, Gonadoblastoma, Mixed germ cell tumor, Testicular feminization, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 40 Issue No. 4, 23-28
2016 December,
(Filipiniana Analytics)
NP

Mullerianosis of the urinary bladder: First case report in the Philippines
Arada, III, Ernesto V. , Dichoso, Marian C. , Cadavedo, Jane Karla

Mullerianosis is a rare, benign, and morphologically complex, tumor-like lesion that consists of an organoid structure with normal Müllerian tissue. The diagnosis requires the presence of at least two of the three mullerian tissues: endometriosis, endosalpingiosis, and endocervicosis. There are only less than twenty (20) cases reported in literature. At present there is no published case report of mullerianosis here in the Philippines. This is a case report of a 30-year old Filipino woman who presented predominantly with lower urinary tract symptoms of severe dysuria, hematuria, and lumbar pain and was evaluated for a urologic problem secondary to a posterior bladder mass. Subsequent evaluations revealed the diagnosis of mullerianosis. This is where the interest in mullerianosis sets, its potential to mimic a neoplastic lesion of the urinary tract from clinical and diagnostic viewpoints. The clinical importance to diagnose this case correctly is of grave importance for appropriate management. **(Author's Abstract)**

Keywords: *Mullerianosis, Endometriosis, Endosalpingiosis, Endocervicosis, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 2, 26-32
2017 March to April,
(Filipiniana Analytics)
NP

National Reference Laboratory Surge Capacity Response to a Massive Nationwide Measles Outbreak in 2013-2014

Tandoc, Armando III

This management case documents the experience of the Research Institute for Tropical Medicine (RITM) National Reference Laboratory, when a massive nationwide outbreak of Measles occurred during the last quarter of 2013 to the whole of 2014. This was the largest infectious disease outbreak referred thus far to the Institute, with an unprecedented 40,000 blood specimens from all over the country received by the laboratory, overwhelming its testing capacity, and causing large backlogs. The incident revealed significant gaps in the laboratory's preparedness to respond to a sudden large surge of specimens.

The activation of a department-level Incident Command System was the most appropriate management approach to implement due to the urgency and scale of the surge of specimens. The response to the specimen surge was prioritized leading to temporary rearrangements in the organizational structure of the department in order to effectively and rapidly coordinate the staff and allocate resources.

Keywords: *measles, outbreak, surge capacity, outbreak response, incident command system, laboratory management, Medicine*

Philippine Journal of Pathology, Volume No. 4 Issue No. 2, 6-14
2019,
(Filipiniana Analytics)

Oral progesterone for maintenance tocolysis after arrested preterm labor: A meta-analysis

Quinio, Irene B. , Palma, Rose

Background: The consequences of preterm birth not only for the baby but also for the mother has been well documented over the years. Numerous interventions have been tried and tested and yet it is still a significant problem to date. Progesterone has been documented to be an effective prophylactic drug against preterm labor for those considered at high risk for developing the condition. However, little is known about its effectiveness when given in oral form as a maintenance tocolysis for those who already suffered from an acute episode or preterm labor.

Objective: To evaluate the effectiveness of oral progesterone in the prevention of preterm birth after being diagnosed of preterm labor

Design: Meta-analysis

Subjects: The study population consisted of women with singleton gestation who were diagnosed with preterm labor, defined as having contractions associated with corresponding cervical dilatation, which were treated with oral progesterone as a maintenance tocolytic until delivery.

Data Collection: Journals were searched in different journal databases. Reviewers independently assessed the eligibility of the articles included in this study. Methodologic quality was reviewed using the Cochrane handbook for systematic reviews of interventions. Version 5.1.0 (updated March 2011). Data extracted were analysed using the Review Manager 5.3 Software (Revman 2014) and the Comprehensive Meta-Analysis Software (CMA3 2016).

Results: No statistical difference was noted in terms of latency prolongation, gestational age at birth, occurrence of preterm birth, and on neonatal outcomes such as APGAR Score < 7 at birth, neonatal sepsis, respiratory distress syndrome, and neonatal death between those who received progesterone and those who did not. However, babies in the progesterone group had a mean birthweight higher than their placebo counterparts.

Conclusion: The use of oral progesterone as a maintenance tocolysis after arrested preterm labor showed no statistically significant benefit except for higher birthweight in babies upon delivery. **(Author's abstract)**

Keywords: *Progesterone, Preterm labor, Preterm birth, Tocolysis, Oral, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 40 Issue No. 3, 9-15
2016 September,
(Filipiniana Analytics)
NP

0539

Ovarian new growth creating a cutaneous fistula: A case report

Limson, Margaret Joyce C. , de Guzman, Gla

Ovarian new growths are among the most common tumors in women. Their presentation at time of diagnosis vary and are often incidental findings on ultrasound examination. Complications of ovarian masses include torsion, rupture, infection, hemorrhage, and malignant degeneration. These masses have also been known to create fistulous tracts to other organs of the body. Entero-adnexal communications have been reported in literature. However, fistula formation to the skin has not yet been reported. Here, we present an adult woman diagnosed to have ovarian new growth and a one-year history of serous discharge from a skin lesion. Imaging studies show a fistulous connection to the abdominopelvic mass. She underwent excision of the mass with fistulectomy. This is the first reported case of an ovarian new growth which created a cutaneous fistula. **(Author's Abstract)**

Keywords: *Cutaneous, Fistula, Ovarian new growth, Teratoma, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 1, 38-41
2017 January to February,
(Filipiniana Analytics)
NP

0540

Overexpressing microRNA-34a overcomes ABCG2-mediated drug resistance to 5-FU in side population cells from colon cancer via suppressing DLL1

Xie, Zheng-Yuan , Wang, Fen-Fen , Xiao, Zhi-Hua , Liu, Si-Fu , Tang, Sheng-Lan , Lai, Yue-Liang

Colon cancer side population (SP) cells are a small subset of cancer cells that have cancer stemness capacity and enhanced drug resistance. ABCG2 is a multidrug resistance-related protein in SP cells and has been demonstrated to be regulated by Notch signalling pathway. Recently, microRNAs are reported to play a critical role in SP cell fate. However, their role in ABCG2-mediated drug resistance in colon cancer SP cells remains unclear. In the current study, the different expressions of miR-552, miR-611, miR-34a and miR-5000-3p were compared within SP and non-SP cells, which were separated from human colon cancer cell lines (SW480 and LoVo). We found that miR-34a was significantly down-regulated in SP cells and that overexpressing miR-34a overcame drug resistance to 5-fluorouracil (5-FU). The luciferase reporter assay indicated that miR-34a negatively regulated DLL1, a ligand of Notch signalling pathway, via binding with 3'-untranslated region of its messenger RNA. In addition, overexpressing miR-34a overcame ABCG2-mediated resistance to 5-FU via DLL1/Notch pathway *in vitro*, and suppressed tumour growth under 5-FU treatment *in vivo*. In conclusion, our findings suggest that miR-

34a acts as a tumour suppressor via enhancing chemosensitivity to 5-FU in SP cells, which provides a novel therapeutic target in chemotherapy-resistant colon cancer. **(Author's abstract)**

Keywords: *Colon cancer, Drug resistance, miR-34a, Notch signalling pathway, Side population cells, Medicine*

The Journal of Biochemistry, Volume No. 167 Issue No. 6, 557-564
2020 June,
(Filipiniana Analytics)
F(S) QP501 J82 167/6 2020

0541

Overexpression of RSK4 reverses doxorubicin resistance in human breast cancer cells via PI3K/AKT signalling pathway

Mei, Yan , Liao, Xiaoming , Zhu, Lingyu , Yang, Huawei

Doxorubicin (DOX) is one of the most effective chemotherapy drugs for the treatment of metastatic breast cancer (BC), but drug resistance becomes an obstacle to treatment. This study aims to investigate the role of Ribosomal S6 protein kinase 4 (RSK4) in regulating BC resistance to DOX. We first used Kaplan–Meier Plotter to identify the prognostic roles of RSK4 in BC. DOX-resistant BC cells (MCF-7/DOX) were constructed and the expression of RSK4 was determined by reverse transcript polymerase chain reaction and western blot. Subsequently, we overexpressed the RSK4 in MCF-7/DOX cells, and measured drug resistance, colony formation, cell migration, invasion ability and cell apoptosis after transfection. In addition, western blot was used to explore the expression of apoptosis-related proteins and BC-resistance protein. Effects of RSK4 on activation of the PI3K/AKT signalling pathway were also tested. Furthermore, tumour xenograft in nude mice was constructed to observe the effect of RSK4 overexpression on tumour growth in vivo. In conclusion, RSK4 was positively correlated with survival rate in BC patients, which is lowly expressed in MCF-7/DOX. Meanwhile, the overexpression of RSK4 may inhibit drug resistance, cell migration, invasion, apoptosis and tumour growth. RSK4 may effectively attenuate DOX resistance in BC by inhibiting the PI3K/AKT signalling pathway. **(Author's abstract)**

Keywords: *Doxorubicin (DOX), Cell migration, Colony formation, Medicine*

The Journal of Biochemistry, Volume No. 167 Issue No. 6, 603-611
2020 June,
(Filipiniana Analytics)
F(S) QP501 J82 167/6 2020

0542

Pathological consequences of the unfolded protein response and downstream protein disulphide isomerases in pulmonary viral infection and disease

Chamberlain, Nicolas , Anathy, Vikas

Protein folding within the endoplasmic reticulum (ER) exists in a delicate balance; perturbations of this balance can overload the folding capacity of the ER and disruptions of ER homeostasis is implicated in numerous diseases. The unfolded protein response (UPR), a complex adaptive stress response, attempts to restore normal proteostasis, in part, through the up-regulation of various foldases and chaperone proteins including redox-active protein disulphide isomerases (PDIs). There are currently over 20 members of the PDI family each consisting of varying numbers of thioredoxin-like domains which, generally, assist in oxidative folding and disulphide bond rearrangement of peptides. While there is a large amount of redundancy in client proteins of the various PDIs, the size of the family would indicate more nuanced roles for the individual PDIs. However, the role of individual PDIs in disease pathogenesis remains uncertain. The following review briefly discusses recent findings of ER stress, the UPR and the role of individual PDIs in various respiratory disease states. **(Author's abstract)**

Keywords: *Disulphide bond, ER stress, PDI, Pulmonary disease, UPR, Medicine*

The Journal of Biochemistry, Volume No. 167 Issue No. 2, pages 173-184
2020 February,
(Filipiniana Analytics)
F(S) QP501 J82 167/2 2020

0543

Philippines Diagnostic Pathology Laboratory Benchmarking

Badrick, Tony

To ensure continuous quality improvement, laboratories need to obtain data about best practice from peers. Data about analytical EQA is available but far less is available about other important aspects of laboratory performance. There is a Roche Diagnostics Survey of laboratories which provides benchmarking in key areas of laboratory performance.

The Roche Diagnostics Survey included 1058 laboratories from 14 countries in the Asia Pacific Region with both developing and developed nations. The data were collected in 2017 but the survey has been collecting data each second year since 2011. Data was collected in the areas of quality, speed and cost.

The results for the Philippines was compared with other countries in the Asia Pacific Region. Broadly it was found that 42% of all laboratories in the Region were accredited to ISO 15189 or ISO 9001 and that 50% of laboratories were in an External Quality Assurance (EQA) program. Compared to other countries in the survey, the Philippines laboratories had fewer sites with ISO 15189 and with Lean Six Sigma improvement deployment. There are six laboratories in the Philippines that are accredited to ISO 15189. There was a greater emphasis on customer satisfaction related Key Performance Indicators (KPIs) such as turnaround time monitoring, cost reduction and employee productivity.

Benchmarking can highlight the differences in the apparent quality of laboratory services compared to their peers and may lead to improvement. The benchmarking comparison has identified opportunities for Philippine laboratories to improve including obtaining ISO 15189 accreditation, implementing laboratory information systems and concentrating on Lean practices to improve productivity. The Roche scheme provides an ongoing (growing) large sample of benchmarks that can be used by participants to improve their performance and the performance of individual countries.

Keywords: *benchmarking, quality, cost of service, customer satisfaction, turnaround time, Medicine*

Philippine Journal of Pathology, Volume No. 5 Issue No. 2, 15-23
2019,
(Filipiniana Analytics)

0544

A Pilot Study on the Evaluation of Clinical Chemistry Laboratory Test Performance using Six Sigma Metrics

Medina, Pier Angeli

Six sigma has been used over the years, initially in manufacturing industries to improve quality by reducing the number of wastes and defects. In the laboratory, it can also provide measurement of quality using the sigma scale.

The main objective of the study is to evaluate the performance of tests in two chemistry analyzers using the six

sigma scale. A total of twenty (28) tests were evaluated on two Abbott Architect c8000 chemistry analyzers from September 2014 to July 2019 using results of quality control mean, coefficient of variation, bias and total allowable error to compute for the six sigma value. Both level one and level two third party quality controls were included in the evaluation.

Results of the study showed the tests that were >6 sigma for both levels 1 and 2 throughout the 5 years. Di-Bil, CK, HLD, TG and UA were consistently >6 sigma for one machine while CK, Di-Bil, HDL, Mg, TG and UA were consistently >6 sigma for the other. Level 1 and Level 2 sigma scores were noted to be incongruent in some analytes as follows: ALB, ALT, K, TP for one instrument and ALB, ALP and AST for the other instrument. Electrolytes Ca, Cl, and Na were generally low.

Using six sigma metrics allowed the laboratory to evaluate the performance of the chemistry tests objectively. Tests that are >6.0 sigma signifies world class performance and entail application of fewer Westgard rules with fewer number of runs while those that are <3.0 need method improvement or more stringent quality control measures. The findings show that we can use this for monitoring and performance evaluation for quality improvement.

Keywords: *bias, laboratory, quality control, quality improvement, six sigma, Westgard rules, Medicine*

Philippine Journal of Pathology, Volume No. 4 Issue No. 2, 31-37
2019,
(Filipiniana Analytics)

0545

PINK1 import regulation at a crossroad of mitochondrial fate: the molecular mechanisms of PINK1 import *Sekine, Shiori*

PTEN-induced kinase 1 (PINK1) is a mitochondrial kinase whose activity is tightly regulated by the mitochondrial health status. In response to mitochondrial damage, activated PINK1 can promote mitophagy, an autophagic elimination of damaged mitochondria, by cooperating with Parkin ubiquitin ligase. Loss-of-function of PINK1/Parkin-mediated mitophagy results in the accumulation of dysfunctional mitochondria, which could be one aetiology of Parkinson's disease (PD). Within step-by-step signalling cascades of PINK1/Parkin-mediated mitophagy, mitochondrial damage-dependent PINK1 kinase activation is a critical step to trigger the mitophagy signal. Recent investigation of this process reveals that this stress-dependent PINK1 kinase activation is achieved by its regulated import into different mitochondrial compartments. Thus, PINK1 import regulation stands at an important crossroad to determine the mitochondrial fate—'keep' or 'remove'? In this review, we will summarize how the PINK1 import is regulated in a mitochondrial health status-dependent manner and how this process could be pharmacologically modulated to activate the PINK1/Parkin pathway. **(Author's abstract)**

Keywords: *Mitochondrial import, Mitochondrial protease, Mitophagy, Parkinsons disease, PINK1, Medicine*

The Journal of Biochemistry, Volume No. 167 Issue No. 3, 217-224
2020 March,
(Filipiniana Analytics)
F(S) QP501 J82 167/3 2020

Postpartum hemorrhage secondary to pseudoaneurysm of the uterine artery: A case report

Elio, Thelma Marie Avendano, Lim, Vanessa Ma

Obstetric hemorrhage is the most important cause of maternal mortality worldwide approximately 27.1%. Pseudoaneurysm of the uterine artery is rare but a potentially life-threatening complication reported to occur. In the Philippines, experience with these kinds of vascular abnormalities is limited. This is a case of a 26-year old Gravida 2 Para 1 (1011) eight weeks post-cesarean section with profuse vaginal bleeding. Transvaginal ultrasonography with doppler revealed arterio-venous malformation of the cervix with high arterial pulsations. Pelvic angiography revealed brisk contrast extravasation and pooling at the fundal branch of the left uterine artery consistent with pseudoaneurysm for which she successfully underwent superselective coil embolization. Repeat ultrasonography after one week showed absence of arterial pulsations on the cervical echogenicity. Despite a recent proliferation of reports, uterine artery pseudoaneurysm still remains to be a rare cause of unexplained postpartum hemorrhage, which requires a high index of clinical suspicion for diagnosis. **(Author's abstract)**

Keywords: *Cesarean section, Postpartum hemorrhage, Pseudoaneurysm, Uterine artery embolization, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 39 Issue No. 4, 28-37
2015 December,
(Filipiniana Analytics)
NP

Power doppler versus saline infusion sonography in the diagnosis of endometrial polyps in patients who present with abnormal uterine bleeding

Rivera, Leah N., Dee, Marlyn T., Nematian,

Objective: To compare the diagnostic performance of Power Doppler versus Saline Infusion Sonography (SIS) in the diagnosis of endometrial polyps in patients who present with abnormal uterine bleeding using histopathological confirmation.

Methods: This is a 2-year cohort study involving non-pregnant patients with abnormal uterine bleeding examined prospectively and subjected to both transvaginal sonography with power Doppler and SIS. Single-vessel pattern/comma-like patterns on power Doppler were considered positive. Results were compared to the gold standard histopathological examination obtained by endometrial biopsy, curettage, or hysteroscopic resection of endometrial polyp.

Results: A total of 42 patients completed the study and were included in the final analysis. Thirty-five (35) patients had confirmed endometrial polyp by histopathology. Power Doppler was positive in 32 of these patients. SIS, on the other hand was positive in 16 patients. The results are as follows: sensitivity 89%, specificity 83%, and positive and negative predictive values 97% and 56% respectively for power Doppler. For SIS, on the other hand, sensitivity 46%, specificity 86%, positive and negative predictive values of 94% and 24% respectively.

Conclusion: Power Doppler is as useful in identifying patients with endometrial polyps and can be used in place of the traditional test SIS. Its diagnostic accuracy is better than SIS. **(Author's abstract)**

Keywords: *Saline Infusion Sonography, Power Doppler, Endometrial Polyp, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 40 Issue No. 1, 19-28
2016 March,
(Filipiniana Analytics)
NP

Predicting Pre-Malignant and Malignant Endometrial Conditions Among Postmenopausal Filipino Women Based on Ultrasound Measurement of Ovarian Volume

Gorgonio, Nephtali M. , Tiuseco, Che

Background: Clinical studies showed a correlation between postmenopausal women with large ovaries and endometrial cancer. Considering the different average ovarian volumes among various races, it is prudent to identify the most valid ovarian volume among symptomatic menopausal women in our population and classify their probability of having a benign or malignant endometrium.

Objective: To determine the relation of ovarian volume measurements using a reference value generated by an ROC curve with endometrial tissue biopsy diagnosis of pre-malignant and malignant endometrium among Filipino postmenopausal women.

Methodology: Fifty menopausal women with vaginal bleeding were included in a six-year review from January 2008 to December 2013. All had transvaginal ultrasonography and underwent endometrial sampling. A receiver operating characteristic (ROC) curve was generated and the most valid ovarian volume was obtained. The ROC curve – generated ovarian volume was used as the cut-off value and was correlated with histopathologic diagnoses.

Results: Among the fifty patients, 30 with benign endometrium had an ovarian volume of <3.51 ml, and 10 patients had an ovarian volume of > 3.51 ml. Among the 10 patients with malignant endometrium, 9 had an ovarian volume of > 3.51 ml, and one had an ovarian volume of < 3.51 ml. The sensitivity of predicting endometrial cancer using ovarian volume of > 3.51 ml as cut-off is 90% (95% CI 55.46 % to 98.34%), while the specificity is 75% (95% CI of 58.80% to 87.29%). Using the chi-square test, it showed a significant association between ovarian volume of > 3.51 ml and malignant endometrium (P=0.0001).

Conclusion: The ROC curve - generated cut-off value of > 3.51 ml for Filipino postmenopausal women may serve as a useful diagnostic tool for classifying patients with pre-malignant and malignant endometrial conditions. **(Author's abstract)**

Keywords: *Postmenopausal, Ovarian Volume, Endometrial Cancer, ROC curve, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 38 Issue No. 4, 9-13
2014 December,
(Filipiniana Analytics)
NP

Pregnancy in Herlyn-Werner-Wunderlich Syndrome: A Case Report and Review of Literature

Gorgonio, Nephtali M. , Sucayan-Sta. Ana, Marizel

Herlyn-Werner-Wunderlich Syndrome (HWWS) is a triad of uterus didelphys, unilateral obstructed hemivagina, and ipsilateral renal agenesis. In the review of the locally published literature, there have been seven HWWS cases reported, none of whom were pregnant. A 24-year-old was diagnosed with Herlyn-Werner-Wunderlich Syndrome during caesarean section of a term pregnancy, occupying the right hemiuterus with obstructed hemivagina. Ultrasound showed uterus didelphys with communicating endometrial cavities. MRI revealed uterus didelphys, two cervixes and an obstructed right hemivagina. The patient refused excision of vaginal septum. Two years later, she delivered spontaneously to a live fetus, occupying the hemiuterus with the unobstructed hemivagina.

In pregnant women with HHWS, who did not undergo prior surgical intervention, the mode of delivery depends on the side of pregnancy. If it is located on the obstructed hemivagina, caesarean section is inevitable. If it is on the unobstructed side, there is hope for vaginal delivery. (**Author's abstract**)

Keywords: *Mullerian duct anomaly, Uterine didelphys, Obstructed hemivagina, Renal agenesis, Herlyn-Werner-Wunderlich Syndrome, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 39 Issue No. 1, 35-42
2015 March,
(Filipiniana Analytics)
NP

0550

Prenatal diagnosis of fetal lower urinary tract obstruction presenting as an abdominal mass in a twin pregnancy using three-dimensional ultrasound with “Fly thru” technology: A case report

Decena, Ditas Cristina D. , Rivera, Leah Socorro N. , Casuela-Dimaano, Ni

We report a case of a twin pregnancy, wherein one twin presented with an abdominal cyst since 12 weeks' gestational age. Upon referral at 21 weeks' gestational age, three-dimensional ultrasound with Fly thru technology was used to aid in the identification of the etiology and nature of the mass. Once megacystis was confirmed, serial vesicocentesis and urine biochemistries were used to direct the management. This shows the potential of Fly thru technology in aiding the clinician in studying fetal congenital anomalies. This can help guide the diagnosis and provide earlier and timely management of such cases. (**Author's abstract**)

Keywords: *Fetal abdominal mass, Fetal megacystis, Three-dimensional Ultrasound with Fly Thru technology, Case Report, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 4, 37-44
2017 July to August,
(Filipiniana Analytics)
NP

0551

Prevalence and Risk-Factors of Musculoskeletal Disorders Among Provincial High School Teachers in the Philippines

Amit, Lito M , Malabarbas, Gerald T

Pain in the muscles and tendons is one of the most common complaints among teachers. The objective of this study was to investigate the prevalence of musculoskeletal disorders (MSDs) and their risk factors among public school teachers in the Philippines. It involved 200 public school teachers in the secondary level from Calbayog City division, Samar Province, Philippines, and used an English version of the Korean Occupational Safety and Health Agency's questionnaire on MSDs for an analysis of musculoskeletal symptoms. The researchers employed frequency and percentages computations to determine the prevalence of MSDs in the respondents. Chi-square test and logistic regression were utilized to compute the correlation among socio-demographic profiles, teaching variables and MSDs. The reported overall prevalence of musculoskeletal pain was 74.5%, with legs (56.5%) and lower back (56%) having the highest prevalence. Significant differences in the prevalence of MSDs were found between age-groups ($P = 0.032$) and salary-groups ($P = 0.045$). Musculoskeletal disorders were prevalent among

secondary public school teachers in the Philippines, suggesting that school administrators, curriculum and policy makers, and other stakeholders should improve the working conditions of teachers. **(Author's abstract)**

Keywords: *Musculoskeletal disorders, Low back pain, Risk factors, Teachers, Philippines, Medicine*

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0552

Prevalence of Postpartum Depression among Mothers who Delivered in a Tertiary Hospital

Capco-Dichoso, Marian , De Chavez, Maria Del

General Objective: To determine the prevalence of postpartum depression among mothers who delivered in a tertiary hospital.

Methods: A total of 115 postpartum patients were included in the study. The Edinburgh Postnatal Depression Scale (EPDS) which was developed in 1987 for screening postpartum women was used in this study. It was translated in Filipino language and has been validated. A score of at least 10 points indicates possible postpartum depression. A score of at least 1 point in question # 10 indicates suicidal ideation.

Results: Out of 115 patients, 89 had an EPDS score below 10 points corresponding to 77.39% of the total population studied, while 26 participants had a score of at least 10 points corresponding to 22.61%. There were 9 respondents who scored at least 1 point in question #10 pertaining to 7.83% of the population.

Conclusion: Postpartum depression is a universal dilemma. In this study, the prevalence of postpartum depression among mothers who delivered in a tertiary hospital in Dasmariñas, Cavite from April to May 2013 is 22.61%. Since postpartum depression is a common condition with serious consequences, screening must be done with a multidisciplinary approach from both the obstetricians and psychiatrists. **(Author's abstract)**

Keywords: *Major Depression, Postpartum Blues, Postpartum Depression, Medicine*

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NP

0553

Prevalence of Urinary Tract Infection among Female Commercial Sex Workers in Boulevard Trading, Davao City

Batistil, Rigil-Kent Joseph F. , Balbas, Siv Milliscent E. , Avey Joy B. Dayaganon,, Salcedo, Keziah Amor D. , Solitana, Jett Hastle

The risk of urinary tract infections (UTI) is increased among female commercial sex workers. This is because the female external reproductive anatomy makes women more prone to UTI during sexual intercourse. During sexual activity, bacteria in the vaginal area are sometimes massaged into the urethra. Hence, this study aimed to find out the prevalence of UTI among female commercial sex workers. Samples of vaginal swabs from 20 subjects were subjected to different tests such as chemical examination (Dipstick Method), microscopic examination, culture techniques and biochemical tests in order to assess the given sample's clinical significance to the study. Results

of the tests showed that out of 20 samples, 16 tested positive for UTI while only four tested negative. The most common microorganisms present in the urine samples were *Trichomonas vaginalis*, *Staphylococcus aureus*, *Staphylococcus saprophyticus* and *Escherichia coli*. Based on the data, the prevalence rate of UTI among the examined female commercial sex workers is 80%, thus there is a high prevalence of UTI among these group people. **(Author's abstract)**

Keywords: *Medical Laboratory Science, Commercial Sex Workers, Urinary Tract Infection (UTI), Laboratory diagnosis, Philippines, Medicine*

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0554

Prognostic scoring index for intrauterine insemination success among Filipino couples *Zamora, Brenda Bernadette B. , Bermio, Gladys A*

Objectives: To identify the clinical factors associated with intrauterine insemination (IUI) success among Filipino couples and incorporate the significant clinical factors in a formula for a prognostic scoring index for the success of IUI.

Methods: This is a review of cases who consulted for infertility and underwent IUI at a tertiary hospital between January 2007 and December 2014. The variables considered for analysis were female age, duration of infertility, etiology of infertility, method of sperm processing, number of preovulatory follicles, total motile insemination count (TMSC), and sperm motility. The outcome measure was determined either by a positive urine or serum beta HCG or a gestational sac on transvaginal ultrasound. Results from the logistic regression analysis were used to develop prognostic scoring index for IUI success. Computed scores were plotted in a Receiver Operating Characteristic Curve and cut off values were determined.

Results: The overall pregnancy rate in this study was 10.7%. Duration of infertility (OR 10.33, 95% CI 3.488-30.602) and sperm motility (OR 5.30, 95% CI 1.830-15.331) showed the strongest significant association with the occurrence of pregnancy. Odds of pregnancy after IUI are likewise increased in female age of < 32.5 years (OR 2.52, 95% CI 1.704-3.734), swim-up method (OR 2.17, 95% CI 1.383-3.415) and TMSC of >19.5 million (OR 1.78, 95% CI 1.076-2.954). The odds of successful pregnancy among patients whose duration of infertility is < 2.5 years and who have a sperm motility count of > 67.5 are more than thrice (OR 3.13, 95% CI 0.095-0.990), compared to those with duration of infertility of > 2.5 years. The formulated prognostic scoring index for IUI success was 18.6, with specificity of 91.1%, sensitivity of 39.4%.

Conclusion: Duration of infertility, female age, sperm motility, TMSC and sperm processing method significantly affect the success of IUI success among Filipino couples studied. Using the formula derived, with a sensitivity of 91% and a sensitivity of 39, couples with a score of >18.6 are more likely to get pregnant 4 times more than those with a score of less than 18.6. **(Author's abstract)**

Keywords: *Intrauterine insemination, Prognostic scoring index, Infertility, Medicine*

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**The Prophylactic Use of Tranexamic Acid for the Reduction of Blood Loss After
Cesarean Section and Vaginal Delivery in Primiparas at a Tertiary Hospital in Manila:
A Single-Blinded Randomized Controlled Trial**

Martin, Carolina Paula C. , Aguedan, Jo-An Ma

Objectives: To determine whether Tranexamic Acid is effective in reducing postpartum blood loss in vaginal and cesarean deliveries and if intravenous Tranexamic Acid can be used as a prophylaxis to reduce blood loss for vaginal and cesarean deliveries in primiparas.

Methods: This is a Single-Blinded Randomized Controlled Trial wherein two groups were assigned for the patients included, one for primiparas undergoing vaginal delivery and the other group for primiparas undergoing cesarean section. A dose of 2 grams of Tranexamic acid (given during the second stage of labor and over 30 minutes before abdominal delivery) were compared to primiparas to whom Tranexamic acid was not given. Blood loss was estimated from the main difference between the pre- and post-test hemoglobin and hematocrit obtained for each group and measured during two periods: first period was 30 minutes before delivery and the second from the end of the delivery of the baby to 2 hours postpartum. The difference was then compared and was used in the computation of the statistics, where t-test on two independent samples was utilized.

Results: One hundred twenty women were recruited to this study. The study was able to determine that those assigned to the Tranexamic acid or treatment group had significant reduction of postpartum blood loss as compared to the control group.

Conclusion: This study demonstrates that use of Tranexamic Acid prior to vaginal or abdominal delivery can reduce blood loss and maternal morbidity in women. (**Author's abstract**)

Keywords: *Tranexamic acid, Postpartum hemorrhage, Hemoglobin, Hematocrit, Medicine*

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**A Prospective Cohort Study Describing The Neonatal Outcomes Of Patients With
Different Categories Of Intrapartal Traces Among Pregnant Women Delivered In A
Tertiary Hospital**

Pelaez-Crisologo, Ma. Cristina , Macaurog, Bain

Background: Continuous electronic fetal monitoring has been under close scrutiny due to lack of consistent interpretation of fetal heart rate tracings, even by perinatologists. In 2008, NICHD revised their definitions, interpretation and research guidelines. ACOG incorporated these guidelines into a 2009 practice bulletin on EFM definitions and the three-tiered fetal heart rate interpretation. After a year of adapting the new classification, the Department of Obstetrics and Gynecology of tertiary hospitals has yet to evaluate locally its use in fetal surveillance during labor and subsequently its value in decision-making. To date, no local study has been published regarding the neonatal outcome of those women whose intrapartal tracings were categorized under the three-tier system.

Objectives: This study aimed to describe the neonatal outcomes of patients with Category I, II, and III traces among pregnant patients admitted in a tertiary hospital. This included APGAR score and disposition of the neonate as primary outcomes.

Methods: This was a prospective cohort study. It was conducted in a tertiary hospital from December 2012 to July 2013. The population consisted of women admitted in the labor room for delivery and underwent intrapartal monitoring and eventually delivered. Inclusions were term or preterm pregnancy ≥ 34 weeks, singleton pregnancy

with no known congenital or lethal fetal anomalies. Exclusions were women with clinically evident chorioamnionitis on admission, multifetal gestations, preterm pregnancy (less than 34 weeks), post-term pregnancy, women who were mentally incapacitated to give consent, and those for outright cesarean section indications. There was no specified number of subjects but all laboring patients who underwent trial of labor in were included. Data was analyzed using descriptive analysis and z-test for proportion. And these data were held confidential. Reading and interpretation of the traces was made by perinatologist fellow on duty. Neonatal outcomes, on the one hand, including the APGAR score were analyzed by pediatrician on duty.

Results: There were a total of 163 subjects included in the study, with age range of 19-33 years old. Subjects were G1P0 to G9P6, with a mean prenatal check-up of 5 times. Among the 163 subjects, 134 had a Category I trace and 17 had Category II traces all throughout their laboring period, and the remainder had combination of category I and II traces. There was no Category III trace observed. For Category I trace, 97.8% of babies had a one minute APGAR score of 7-9, 1.5% had a one minute APGAR score of 4-6, and 0.7% had a one minute APGAR score of 1-3. The five-minute APGAR score with Category I trace were as follows: 99.3% had APGAR score of 7-9, 0.7% had APGAR score of 4-6, but there was none with a five-minute APGAR score of 1-3. Majority (63.4%) of the babies in Category I were direct room-in, 14.9 % were high-risk direct room-in, 10.4% babies were admitted in Neonatal Intensive Care Unit 2 (NICU2) and 11.2% in NICU3. Three (2.2%) of the babies in NICU3 were intubated. For the Category II trace, 100% of babies had one and five minute APGAR score of 7-9. Thirteen (54.2%) of the babies were direct-room in. 37.5% of the babies were admitted in NICU2. One baby (4.2%) was admitted in NICU3 but not intubated. The resuscitative measures done were as follows: tactile stimulation, thermoregulation, suctioning, inhalation, and intubation. Among these measures, suctioning (with a p-value of .02) showed a significant difference between Category I and Category II traces. Category II traces were associated more with abdominal delivery. Spinal anesthesia which was usually used in abdominal deliveries is also significantly different from the two traces, with a p-value of 0.02. Category I traces had a significantly higher morbidity and mortality compared to Category II traces.

Conclusion: There was no significant difference between the one-minute and five-minute APGAR score and disposition of babies between Category I and Category II traces. Abdominal delivery, spinal anesthesia and suctioning were higher in Category II trace than in Category I trace. **(Author's abstract)**

Keywords: *Intrapartum monitoring, Category I trace, Category II trace, Category III trace, Medicine*

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0557

A prospective cross-sectional analysis on the adherence to the four time-bound interventions of the essential intrapartum and newborn care program (EINC) in a private tertiary hospital in Metro Manila

Manahan, Maria Regina P. , Ramirez, Ana Kar

Background: The fourth Millennium Development Goal set out by the United Nations in 2000 aims to reduce under-five mortality globally, of which the major contributor is neonatal mortality. Aside from the direct causes of neonatal deaths, newborns may die due to lack of access to the basic care. The World Health Organization started Essential Intrapartum and Newborn Care (EINC), an evidenced-based program that adapts safe and quality care for newborns and mothers. In response to this call, the Philippine Department of Health under Administrative Order 2009-0025, instituted Unang Yakap, a protocol comprised of four time-bound interventions. These are immediate drying, uninterrupted skin-to-skin contact, delayed cord clamping and early initiation of breastfeeding. This should be performed immediately and sequentially upon birth up to the 1st hour of life.

Objective: It is the aim of this study to assess the adherence of the obstetricians to performing these time-sensitive interventions during deliveries and to uncover substandard practices.

Methods: This prospective, cross-sectional, single-center study was conducted for 1 year. The birthing process was observed from pushing up to the 1st hour after birth. The timing and sequence of each newborn care intervention was recorded in a standardized assessment tool as they were performed. Other interventions not specified in the tool were also recorded.

Results: The steps of EINC were performed in 100% of deliveries. However, total adherence to the 4 time-bound interventions was less than 50%.

Conclusion: This direct observational study shows that obstetricians were compliant to EINC in all the deliveries but adherent to the protocol in less than half only. Unnecessary interventions were observed although substandard practices were not demonstrated. The compliance of all birthing events to the protocol implies that EINC is a simple and uncomplicated procedure. Full adherence can be accomplished if physicians are re-oriented to the benefits of EINC. **(Author's abstract)**

Keywords: *Newborn Care (EINC), World Health Organization, Medicine*

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0558

A Prospective Randomized Study On Maternal And Infant Outcomes Of Intrapartum Transcervical Amnioinfusion Versus Standard Obstetric Care For Parturients With Meconium Stained Amniotic Fluid: A Preliminary Report
Alatraca-Malonzo, Ira Dominique T. , Pelaez-Crisologo, Ma. Cristi

Background: Amnioinfusion, or transcervical infusion of saline into the amniotic cavity, has been proposed as a method for reducing the risk of meconium aspiration syndrome.

Objective: This study aims to assess the effect of intrapartum amnioinfusion with meconium stained amniotic fluid on cesarean section rate, incidence of meconium aspiration syndrome, neonatal ICU admission, perinatal death and adverse maternal outcomes.

Methods: This study is a randomized controlled trial from June to September 2013, conducted in the service wards of a university hospital. The study population consists of parturients 19-45 years old with singleton term low-risk pregnancies, in cephalic presentation, with cervical dilatation at 2-6 cm, with ruptured membranes showing meconium stained amniotic fluid.

Results: Meconium aspiration syndrome occurred in one infant in the amnioinfusion group and in three infants in the control group (9% vs. 25%). There was a lower rate of neonatal pneumonia and neonatal sepsis in the treatment arm (0% vs. 8% and 9% vs. 17%, respectively). There were no perinatal deaths in both groups. Neonatal ICU admission was seen less in the treatment arm (9% vs. 25%) The cesarean section rate did not differ significantly in both groups (9% vs. 8%). Maternal morbidity was seen less in the treatment group. None of the patients in the amnioinfusion arm had fever while two patients in the control group had pyrexia (0% vs. 17%). Hospital stay was also shorter for patients in the treatment group with an average duration of 3 days, as opposed to 4 days in the control arm.

Conclusion: Amnioinfusion is a relatively simple technique of reducing perinatal and maternal morbidity in patients with meconium stained amniotic fluid. Although this study did not show any significant difference between the two groups, there is a trend towards better neonatal outcomes and decreased maternal morbidity with amnioinfusion. **(Author's abstract)**

Keywords: *Medicine, Amnioinfusion, Intraamniotic saline infusion, Meconium, Meconium aspiration syndrome*

0559

Raging vessels: A case report on a young pregnant overt diabetic patient with cerebral cavernous malformation presenting as pontine hemorrhage and hepatic hemangioma

Penolio, Vaneza Valentina L. , Paulino-Morente, Joanna Marie, Cacas, Ireen

Reported is a case of a 29-year old Gravida 5 Para 4(4004), 23 6/7 weeks pregnant, known diabetic with hepatic hemangioma, who previously underwent ligation of ruptured esophageal varices, was admitted for the first time on February 21, 2015 due to left-sided hemiparesis. Identifying the cause of the pontine bleed and its possible association with coexisting medical problems was an arduous process since there are no existing management guidelines. Emergency Caesarean Section with bilateral tubal ligation under general anesthesia was done at 35 weeks AOG and a live baby girl was delivered with an Apgar score of 9,9. Magnetic Resonance Angiography (MRA) of intracranial vessels postpartum revealed a Cavernoma. This case is of particular importance due to the following reasons: 1.) Cerebral Cavernous Malformation (CCM) is a rare disease, 2.) There is scant data associating CCM with pregnancy, 3.) Current literature has not reported CCM with Hepatic Hemangioma in a single patient, 4.) No data has linked it with diabetes mellitus, 5.) There are still no management guidelines of CCM in pregnancy, 6.) A multidisciplinary approach is necessary for optimal maternal and fetal outcomes. **(Author's abstract)**

Keywords: *Cavernous malformation, Cerebrovascular bleed, Pontocerebellar haemorrhage, Cavernous angioma, Liver hemangioma, Medicine*

0560

A randomized controlled trial on the efficacy of methotrexate in preventing postmolar gestational trophoblastic disease among patients with high-risk complete hydatidiform mole

Saravillo-Saniel, Katherine B. , Billod, Jimmy A. , Festin-Dalawangbayan, Maria Anna Luisa L. , Soriano-Estrella, Ag

Objective: This study aimed to determine the efficacy of methotrexate in preventing postmolar gestational trophoblastic disease (PMGTD) among patients with high-risk complete hydatidiform mole.

Methods: This was a double-blind randomized controlled trial carried out from 2007 to 2013. A total of 99 patients with high-risk complete hydatidiform mole who underwent suction curettage were randomly allocated to either the treatment or control group. The treatment group received methotrexate while the control group received a vitamin B complex. The number of patients who developed PMGTD in each group was recorded. All tests of significance were carried out at a .05 alpha level of significance, 95% confidence interval.

Results: There was no significant difference between the two groups in terms of age, gravidity, baseline β hCG, age of gestation, and corpus size. The overall incidence of PMGTD was 27.9%. For the per protocol analysis, a total of 30 patients received chemoprophylaxis while 31 patients received placebo treatment. The total incidence of PMGTD was 16.67% for the treatment group and 38.71% for the control group. The computed risk ratio was 0.43 (95% C.I.: 0.17-1.07, p value = 0.07).

Conclusion: Results failed to reach statistical significance but the large fall-out rate may have significantly affected the outcome of the study. Methotrexate chemoprophylaxis may still be useful in preventing PMGTD, particularly in settings where the incidence of hydatidiform mole is high and there is high probability that patients will fail to follow the stringent β hCG monitoring schedule after molar evacuation. **(Author's abstract)**

Keywords: *Gestational trophoblastic neoplasia, Complete hydatidiform mole, Chemoprophylaxis, Methotrexate, Postmolar gestational trophoblastic disease, Medicine*

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0561

Randomized, single-blinded comparison of efficacy, safety and tolerability of metronidazole 750mg-miconazole 200mg vaginal suppository vs. metronidazole 500mg-nystatin 100,000 IU vaginal suppository in the treatment of bacterial vaginosis, vulvovaginal ca

Sison, Olive , Fallarme, Analyn F. , Bravo, Sybil Lizanne R. , Cagayan, Ma. Stephanie Fay S., Gabaldon, May

Objective: This randomized, single-blind, two-arm controlled study compared the efficacy, safety, and tolerability of an intravaginal suppository preparation containing metronidazole 750mg + miconazole 200mg (Neopenotran Forte) with another vaginal preparation containing metronidazole 500 mg + nystatin 10000 IU (Flagystatin) in the treatment of bacterial vaginosis (BV), candidal and trichomonal vulvovaginitis (CVV, TV), mixed vaginitis and in the prevention of secondary candidal vulvovaginitis.

Materials and Methods: Women ages 18-45 years with chief complaints of abnormal vaginal discharge or vaginal/vulvar itching were examined and microbiologic confirmation of BV, VVC, TV or mixed infection was made. They were then randomly assigned to receive either treatment once daily (nightly) for 7 days. A total of 261 subjects had evaluable clinical and microbiological findings at the end of the study. Test of cure by Amsel criteria and Nugent score were performed twice after treatment.

Results: The overall test revealed that microbiological cure rate is significantly different between the two treatment groups.

Conclusion: The odds of being cured microbiologically is 2.35 times more in the metronidazole 750mg + miconazole nitrate 200mg group compared to the metronidazole 500 mg + nystatin 10000 IU group. However, no significant difference in the clinical cure between the two groups was found. Both drugs are safe and convenient to use. **(Author's abstract)**

Keywords: *Bacterial vaginosis, Vulvovaginal candidiasis, Trichomonal vaginitis, Mixed vaginal infections, Metronidazole - miconazole vaginal suppositories, Metronidazole 500 - nystatin vaginal suppositories, Medicine*

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0562

A Rare Case Of Gliomatosis Peritonei Associated With A Mature Ovarian Teratoma

De Castro, Maria Angela B., Benitez, Glenn

Gliomatosis peritonei is the deposition of benign glial implants, more commonly associated with an immature ovarian teratoma. This paper reports a case of a 24 year old gravida 1 para 1 (1001) who underwent unilateral salpingo-oophorectomy and complete surgical staging for a preoperative diagnosis of ovarian new growth, probably malignant. Intraoperatively, aside from the ovarian mass on the right, there was also note of an omental mass. Histopathology revealed a mature ovarian teratoma for the ovary and gliomatosis peritonei for the omental mass. Gliomatosis peritonei is a rare entity. There are currently no guidelines on how patients with this condition can be followed up. Transvaginal sonography and annual measurement of alpha-fetoprotein may play a role in the follow-up of patients in low resource settings. **(Author's abstract)**

Keywords: *Gliomatosis peritonei, Mature ovarian teratoma, Benign glial implants, Unilateral salpingo-oophorectomy, Medicine*

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0563

A rare case of malignant transformation of mature cystic teratoma: A case report

De Castro-Malig, Marie Aleli , Loria, Ma. Elizab

women. This case report shows a rare case of squamous cell carcinoma arising from a mature cystic teratoma in a 59-year-old postmenopausal woman. Malignant transformation occurs in 1% of all cases of mature cystic teratomas and due to its rarity, there is no established protocol regarding optimal diagnosis and management. Preoperative diagnosis was difficult due to nonspecific symptoms such as abdominal mass and abdominal pain present in this patient. The surgery was planned based on the large size of the tumor on imaging, menopausal age and a family history of breast cancer in the family. She subsequently underwent Total Abdominal Hysterectomy with Bilateral Salpingo-oophorectomy, Frozen Section, Bilateral Lymph Node Dissection, Infracolic Omentectomy and Right Internal Iliac Artery Ligation. Final diagnosis was confirmed post operatively with the final histopathologic report. This report would show that proper risk assessment and preoperative planning would optimize management of even rare cases of malignant tumors. **(Author's abstract)**

Keywords: *Malignant Transformation, Teratoma, Squamous Cell Carcinoma, Medicine*

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0564

A Rare Case of Virilizing Ovarian Steroid Cell Tumor in a 46 year-old Woman:: A Case Report and Review of Literature

Manabat, Manuel S. , Irabon, Ina S. , Andres, Audrey Ang

Virilization is the masculinization and enhancement of male secondary sexual characteristics in females. The etiology may be of adrenal or ovarian in origin. This case report shows a 46 year old woman who presented with defeminizing and virilizing symptoms. Further laboratory investigations revealed increased serum androgen levels

and normal CT scan of the adrenals and kidneys. An ovarian mass was confirmed by transrectal ultrasonography. Following a total abdominal hysterectomy and bilateral salpingoophorectomy, histopathological and immunohistochemistry studies on the left ovarian mass confirmed an androgensecreting, steroid-cell tumor, not otherwise specified (NOS). Serum testosterone values abruptly declined to normal levels within 1 month post-surgery. This paper likewise discusses an extensive review of literature regarding this rare ovarian tumor. **(Author's abstract)**

Keywords: *Steroid cell tumor not otherwise specified, Virilization, Immunostaining, Medicine*

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0565

Recognizing the link between ovarian teratoma and autoimmune encephalitis: A case report of ovarian teratoma-associated anti-N-methyl-D-aspartate receptor encephalitis

Toral, Jean Anne B., SeÁ±eris, Aub

A 36-year old nulligravid who initially presented with a one-week history of flu-like symptoms suddenly developed behavioral changes, agitation and irritability. Diagnostic tests were done and empiric treatment for viral encephalitis were initiated. Symptoms persisted with progressive unresponsiveness and episodes of seizure. Hypoventilation from dysautonomia required mechanical ventilation. Elevated levels of immunoglobulin on cerebrospinal fluid (CSF) and deterioration despite treatment raised suspicion for an autoimmune encephalitis. A referral to a gynecologist to rule out an ovarian focus was done. Ultrasound and biopsy established the presence of ovarian teratoma. The diagnosis of anti-N-methyl-D-Aspartate receptor encephalitis was confirmed when the patient's serum and CSF tested positive for these antibodies. In addition, her CSF was also positive for anti-alpha-amino-3-hydroxy-5-methylisoxazole-4-propionic acid receptor (Anti-AMPAr) antibodies. In the Philippines, this was the second documented case of Anti-NMDAr encephalitis associated with ovarian teratoma and the first to have two antibodies present causing encephalitis. **(Author's abstract)**

Keywords: *Dermoid cyst, Ovarian teratoma, Anti-NMDAr encephalitis, Anti-AMPAr encephalitis, Medicine*

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0566

Recurrent hydatidiform mole with NLRP7 mutation: The first confirmed case in the Philippines

Medina, Martin Antonio B., Soriano-Estrella, Agne

High gravidity hydatidiform mole (HM) without normal pregnancy is very rare. The challenge of managing such cases will dwell on the concern of having normal conception versus having another molar gestation and its sequelae.

Presented in this paper is a case of a 32-year-old, gravida 5 para 0 (0040) who was admitted for the management of her fifth molar pregnancy. She underwent suction curettage and administration of methotrexate chemoprophylaxis. Genetic testing was done, which revealed a homozygous mutation in NLRP7, the gene

implicated in recurrent molar gestations. This paper discusses the proper approach to determine the cause of recurrent molar pregnancies, as well as the management and prognosis of such cases. **(Author's abstract)**

Keywords: *Familial hydatidiform mole, Recurrently hydatidiform mole, NLRP7 mutation, Medicine*

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0567

Recurrent Shoulder Tip Pain After Ventriculoperitoneal Shunt Placement Associated with Infectious Peritonitis with *Propionibacterium acnes*: A Case Report and Review of the Literature

Suzuki, Kohei , Saito, Takeshi , Sakai, Kyohei , Honda, Yuko , Hoshina, Takayuki , Ogawa, Masato , Asai, Hiroshi , Yamanouchi, Takeshi , Yamamoto, Junkoh

Ventriculoperitoneal (VP) shunt placement is commonly performed for the treatment of hydrocephalus, and several complications of this procedure are well known. Radiating shoulder tip pain after VP shunt placement has been reported as an unusual complication in a few cases, associated with dislocation of the peritoneal catheter. We described the case of a 9-year-old girl who presented with recurrent radiating shoulder tip pain after VP shunt placement. The pain recurred after peritoneal catheter repositioning because of peritoneal inflammation and adhesion due to peritonitis with *Propionibacterium acnes* (*P. acnes*). This bacterium was isolated using 16S ribosomal

RNA gene polymerase chain reaction (16S rRNA gene PCR), and anaerobic and prolonged culture tests. After antibacterial treatment, ventriculoarterial (VA) shunt placement was successfully performed. Hemidiaphragm irritation by the peritoneal catheter leads to radiating shoulder tip pain, and peritoneal inflammation and adhesion caused by infectious peritonitis may cause recurrence of this despite catheter repositioning. Clinicians should be aware of shoulder pain as a complication of VP shunt placement, and should consider VA shunt placement as an alternative treatment if this symptom recurs after catheter repositioning. Furthermore, 16S rRNA gene PCR and anaerobic and prolonged culture tests should be considered to detect *P. acnes* infection. **(Author's abstract)**

Keywords: *Shoulder pain, Ventriculoperitoneal shunt, Ventriculoarterial shunt, Propionibacterium acnes, Pediatric neurosurgery, Medicine*

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0568

Regulation of growth in *Drosophila melanogaster*: the roles of mitochondrial metabolism

Jacobs, Howard T. , George, Jack , Kemppainen, Esko

Mitochondrial functions are often considered purely from the standpoint of catabolism, but in growing cells they are mainly dedicated to anabolic processes, and can have a profound impact on the rate of growth. The *Drosophila* larva, which increases in body mass ~200-fold over the course of ~3 days at 25°C, provides an excellent model to study the underlying regulatory machinery that connects mitochondrial metabolic capacity to growth. In this review, we will focus on several key aspects of this machinery: nutrient sensing, endocrine control of feeding and

nutrient mobilization, metabolic signalling, protein synthesis regulation and pathways of steroid biosynthesis and activity. In all these aspects, mitochondria appear to play a crucial role. **(Author's abstract)**

Keywords: *Ecdysone, Insulin signalling, PGC-1, Proteostasis, Pyruvate, Medicine*

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0569

The Relationship Between Fear-avoidance Beliefs in Employees with Chronic Musculoskeletal Pain and Work Productivity: A Longitudinal Study

Sugano, Ryosuke , Ikegami, Kazunori , Ando, Hajime , Nozawa, Hiroki , Michii, Satoshi , Kondo, Miho , Imoto, Hitomi , Shima, Azusa , Kawatsu, Yuichiro , Fujino, Yoshihisa , Ogami, Akira

This study aimed to identify risk factors for chronic musculoskeletal pain (CMSP) and sought to examine the effect of fear-avoidance beliefs (FABs) on work productivity in workers with CMSP. We performed a longitudinal study using self-administered questionnaires given to employees in three different industries between April 2016 and March 2017. The questionnaire concerned background characteristics, work-related factors and musculoskeletal pain, the Work Functioning Impairment Scale (WFun), and the Japanese version of the Tampa Scale for Kinesiophobia (TSK-J). We performed logistic regression analysis to evaluate factors affecting CMSP and a multi-way analysis of variance to analyze the relationship between FABs and CMSP and the effect of FABs on the ability to function at work. Age (odds ratio [OR] = 1.02, 95% confidence interval [CI]: 1.00-1.03), mean working hours (OR = 1.18, 95% CI: 1.04-1.33), and changes in working hours (OR = 1.18, 95% CI: 1.02-1.37) were significantly associated with CMSP. Regarding FABs, we found that the stronger the FAB, the greater the WFun score, and that an increase in FABs resulted in a significant increase in WFun scores. This study demonstrated that long or increased working hours may be risk factors for CMSP, and that stronger FABs in those with CMSP are associated with decreased ability to function at work. In addition, measures to reduce FABs in workers with CMSP may be effective. **(Author's abstract)**

Keywords: *Fear-avoidance beliefs, Chronic musculoskeletal pain, Work productivity, Presenteeism, Occupational health, Medicine*

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0570

Removal of Double Cavernous Angioma of the Frontal Lobe using a Three-Dimensional Printed Model: A Case Report

Umemura, Takeru , Nishizawa, Shigeru , Miyachi, Hiroshi , Yamamoto, Junkoh

Cerebral cavernous angiomas are vascular anomalies with dilated spaces. We report the case of rare double cavernous angiomas causing higher brain dysfunction. A 74-year-old man exhibited cognitive dysfunction. Magnetic resonance imaging showed two tumors with hemorrhage in the left frontal lobe. Preoperative diagnosis was hemorrhage caused by cavernous angiomas. A 3D model of the double cavernous angioma was made to confirm their association with cortical veins and tumors. Tumors were removed using a single small corticotomy. This is

the first report of a rare double cavernous angioma and the 3D printed model facilitated removal of the tumors. **(Author's abstract)**

Keywords: *Cavernous angioma, Frontal lobe., Hemorrhage, Magnetic resonance imaging, Three-dimensional printer, Medicine*

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0571

A retrospective study on the accuracy of sassone, lerner and IOTA simple rules in determining malignancy of ovarian masses in a tertiary hospital ob-gyn ultrasound diagnostics unit

San Juan, Filomena S. , Morales, Arri

Background: Ultrasonography has been established as one of the important diagnostic tools in detecting and classifying ovarian masses. Several studies have been made in determining the sensitivity and specificity of the different scoring systems as to determining the malignancy of ovarian masses. In a tertiary hospital ultrasound diagnostic unit, three scoring systems are utilized namely Lerner, Sassone and IOTA simple rules.

Objective: To determine and compare the sensitivity and specificity on the most utilized ultrasound scoring systems in determining malignancy of ovarian masses.

Methods: A single center observational, analytical, cross-sectional study utilizing review of the transvaginal or pelvic ultrasound results of women with ovarian masses that were scored using Sassone, Lerner and IOTA Simple Rules in a tertiary hospital ultrasound diagnostics unit from January 2013 to June 2016 was done. The sensitivity, specificity, positive and negative predictive values of each scoring system utilized was determined and compared with the histopathologic result.

Results: Out of the 111 ovarian masses that were included in the study, 44 ovarian masses were scored using Lerner Scoring system with a sensitivity, specificity, positive and negative predictive values of 100%, 65% 22.2% and 100%. 105 ovarian masses screened using Sassone Scoring System showed a sensitivity, specificity, positive and negative predictive values of 100%, 68%, 20.5% and 100%. A total of 33 out of the 111 ovarian masses were scored using the IOTA scoring system with a sensitivity, specificity, positive and negative predictive values of 100%, 85.6%, 55.5% and 100%.

Conclusion: IOTA simple rules had a high sensitivity and specificity compared to Sassone or Lerner Scoring System. However, we cannot fully conclude that individual specificity will be better than combined tests since there is limited number of ovarian masses analyzed. **(Author's Abstract)**

Keywords: *Malignancy, Ovary, Ultrasonography, Sensitivity, Specificity, Medicine*

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NP

0572

The role of male partner perceptions in the intention to pursue contraception of teenage female adolescents with previous pregnancy experience: A cross sectional multi-setting survey: A cross sectional multi-setting survey

Tuquero, Janette P. , Mauricio, Mari

Background: There is a dearth of studies that explore the perceptions of male partners of adolescent females towards the intention of pursuing contraception.

Objective: To determine the role of male partner perceptions in the intention to use of contraception among female adolescents to prevent unplanned repeat pregnancies.

Materials and Methods: An urban sample of 102 male partners of female adolescents with previous pregnancy experience coming from the out-patient department and selected barangay health center responded to a two-part questionnaire that explored their perceptions towards contraception. Demographic data and their positive and negative views, attitudes and actual practice of contraception as it affects future intention to engage in family planning methods were determined.

Results: Male sexual partners have positive perceptions towards contraception. Despite this, utilization rate was still low (56.8%). Positively correlated with contraceptive intention include the male partner's advanced age and high level of education. Perceptions that favor strong intention include careful pregnancy planning in the future, not wanting a pregnancy too soon, knowledge of a specific method, its perceived benefits, "shared decision" making, feeling "happy" when contraceptives are offered rather than forced and when a woman lacks trust in him. Forcing contraception by the female adolescent partner was negatively correlated with contraceptive intention.

Conclusion: Shared decision making towards contraception in order to reduce unintended pregnancies should engage the male partner's participation by correcting prevailing misperceptions. **(Author's abstract)**

Keywords: *Adolescent pregnancy, Contraception, Male partner, Perception, Medicine*

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0573

The role of sonography in the diagnosis of chronic puerperal uterine inversion: A case report

Reforma, Kareen N. , Figueras, Isabelle Julie

Chronic puerperal uterine inversion is a rare and life-threatening obstetric emergency which requires emergent treatment. We present a case of a 27-year-old Gravida 2 Para 2 (2002) with chronic uterine inversion. A bleeding, 4 x 4 x 5 cm fleshy knob like mass protruding from the cervix, was seen during vaginal inspection. Two-dimensional transvaginal sonography and 3-dimensional imaging clinched the diagnosis of uterine inversion. The patient underwent Haultain's procedure and was discharged improved with resumption of normal menses. Postpartum transvaginal sonography revealed a normally positioned uterus. **(Author's abstract)**

Keywords: *Chronic puerperal uterine inversion, Haultain's procedure, Sonography, Medicine*

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NP

Role of the N-terminus in human 4-hydroxyphenylpyruvate dioxygenase activity

Feng, An-Ning , Huang, Chih-Wei , Lin, Chi-Huei , Chang, Yung-Lung , Ni, Meng-Yuan , Lee, Hwei-Jen

4-Hydroxyphenylpyruvate dioxygenase (HPPD) is a key enzyme in tyrosine catabolism, catalysing the oxidation of 4-hydroxyphenylpyruvate to homogentisate. Genetic deficiency of this enzyme causes type III tyrosinaemia. The enzyme comprises two barrel-shaped domains formed by the N- and C-termini, with the active site located in the C-terminus. This study investigated the role of the N-terminus, located at the domain interface, in HPPD activity. We observed that the k_{cat}/K_m decreased ~8-fold compared with wild type upon removal of the 12 N-terminal residues ($\Delta R13$). Interestingly, the wild-type level of activity was retained in a mutant missing the 17 N-terminal residues, with a k_{cat}/K_m 11-fold higher than that of the $\Delta R13$ mutant; however, the structural stability of this mutant was lower than that of wild type. A 2-fold decrease in catalytic efficiency was observed for the K10A and E12A mutants, indicating synergism between these residues in the enzyme catalytic function. A molecular dynamics simulation showed large RMS fluctuations in $\Delta R13$ suggesting that conformational flexibility at the domain interface leads to lower activity in this mutant. These results demonstrate that the N-terminus maintains the stability of the domain interface to allow for catalysis at the active site of HPPD. **(Author's abstract)**

Keywords: *4-hydroxyphenylpyruvate dioxygenase, Molecular dynamics simulation, N-terminal segment, Truncated mutation, Tyrosine catabolism, Medicine*

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Roles of GPRC5 family proteins: focusing on GPRC5B and lipid-mediated signalling

Hirabayashi, Yoshio , Kim, Yeon-Jeong

In the past decade, physiological roles and molecular functions of GPRC5 family receptors, originally identified as retinoic acid-induced gene products, have been uncovered, even though their intrinsic agonists are still a mystery. They are differentially distributed in certain tissues and cells in the body suggesting that cell-type-specific regulations and functions are significant. Molecular biological approaches and knockout mouse studies reveal that GPRC5 family proteins have pivotal roles in cancer progression and control of metabolic homeostasis pathways. Remarkably, GPRC5B-mediated tyrosine-phosphorylation signalling cascades play a critical role in development of obesity and insulin resistance through dynamic sphingolipid metabolism. **(Author's abstract)**

Keywords: *Ceramide, Diacylglycerol, GPRC5B, Insulin resistance, Sphingomyelin, Medicine*

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Salivary ferning as an alternative to sonographic follicle monitoring for determining ovulation: A comparative study

Dee, Marlyn T. , Magno, Bel

Objective: To determine if salivary ferning correlates significantly with sonographic indices in identifying the fertile period, and whether it may be used as a cheaper, and more convenient way to aid infertility patients in achieving pregnancy.

Population: Subjects who complain of difficulty achieving pregnancy and for whom follicle monitoring was indicated were recruited from the Outpatient Department in a tertiary hospital in Manila.

Methodology: Patients (n=40) with Primary or Secondary Infertility from April 2013 to August 2015 who require serial follicle monitoring as part of infertility work up were recruited in the study. For every follicle monitoring by ultrasound done by one sonologist, a salivary sample was obtained from the subject and the ferning pattern was determined and recorded by one pathologist blinded as to the day of the subject's menstrual cycle.

Results: There was a total of 40 subjects who underwent 2 serial follicle monitoring during the study. The 1st TVS (preovulatory) was done between Day 9 to 14 of the cycle with an average of Day 11. Correspondingly, salivary ferning done showed that there were 26 (65.0%) with Salivary Ferning 1 pattern and 14 (35.0%) with Salivary Ferning 2 pattern (p=0.35). This showed no significant difference between follicle monitoring and salivary ferning pattern and either may be used in identifying fertile period preovulatory. The 2nd TVS (postovulatory) was done between Day 12 to 21 with an average of Day 16. All the second ultrasound findings showed signs of ovulation. Correspondingly, there were 1 (2.0%) showed Salivary Ferning 1 pattern, 11 (27.5%) showed Salivary Ferning 2 Pattern and 28 (70.0%) showed Salivary Ferning 3 Pattern 9 (p=0.05). This showed no significant difference between follicle monitoring and salivary ferning pattern, hence, TVS follicle monitoring remains more reliable in identifying that ovulation has occurred.

Conclusion: Salivary ferning corresponded well with ultrasonographic findings during the preovulatory phase of the cycle, while no correlation was noted between the salivary ferning pattern and the postovulatory phase of the cycle. Hence, sonographic follicle monitoring remains a better predictor of ovulation, and more effective in identifying the fertile period. **(Author's abstract)**

Keywords: *Follicle monitoring, Infertility, Salivary ferning, Medicine*

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0577

Self-reported Seasonal Symptoms and Diseases and Primary Healthcare Utilization Among Rural Elderly Women in Sylhet District, Bangladesh

Hamiduzzaman, Mohammad

The physical health and conditions of elderly people are challenged by the adverse effects of seasonal variations in sub-tropical countries, including Bangladesh. Research to date does not feature the risk of seasonal changes for primary healthcare infrastructures and practices in supporting elderly women's care, especially in rural areas. This study aims to identify the health effects of seasonal variations that place increased risk of symptoms and diseases on rural elderly women, and to explore the determinants associated with the women's use of healthcare locally. Using a mixed-methods approach, audio-recorded semi-structured interviews including a short survey with sixty-five rural elderly women and eleven healthcare professionals were conducted. Quantitative data were analyzed in SPSS, and a thematic analysis of the qualitative data was facilitated by NVivo. Self-reported health history by rural elderly women identified the prevalence of three major seasonal symptoms: headache (28/43.1%), digestive

disorder (27/41.5%), and physical pain (27/41.5%). The prevalence of three symptoms such as nausea, headache and digestive disorder varied significantly ($p < 0.05$) across the study villages. Of the women, the age group (60-70 years) recorded the highest number of cases (20), followed by age group (71-80 years/15), where the number of cases significantly varied across three seasons ($p = 0.021$). While 78.5% and 55.4% reported one and two symptoms/diseases respectively, the community clinic visits differed significantly ($p = 0.011$) among the seasons. The utilization of primary healthcare was low, and marginalization in using healthcare was underpinned by the health system, the poor living conditions of the women, and their reluctance to seek treatment. The findings suggest a need for policy solutions in promoting preventive measures and treatments by strengthening local clinics and on-going health education and training of staff and elderly women. **(Author's abstract)**

Keywords: *Seasonal variations, Health effects, Primary healthcare, Determinants, Rural elderly women, Medicine*

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0578

Storytelling as a Health Teaching Strategy for Dengue Prevention and Control in the Philippines

Solidum, Judilyn N. , Solidum, Gilmore G.

Storytelling is an approach to teaching and learning that develops from the lived experiences of teachers, clinicians, and students. Dengue has been a continuous concern in the country as it persists as a major mortality cause. This study aimed to prove that story telling facilitates learning on Dengue principles and Dengue prevention concepts at the elementary and pre school level. This study, done in a span of two years, followed a one-group pre-test, post-test experimental design. A self-made test was used for the assessment of the respondents' knowledge before and after storytelling. This was done seven times in different groups, five in the elementary level (grades 5 and 6) and two in the preschool level in Quezon City, Metro Manila, and Camarines Sur in Bicol region. Three original storybooks for storytelling were used as teaching-learning materials namely Moskee ang Bampirang Lamok, Dinudugo si Dino, Huwag MOKONG Kagatin (Kwento ng batang na dengue). To determine the difference between the mean scores of the respondents, paired two-tailed T-test was used. All p-values in the seven groups showed values lesser than 0.0001. There is extremely statistically significant difference between the means of pre and post test results of the subjects. The respondent students mentioned that the sessions were fun, and entertaining; they remembered the concepts through story events and characters. It was added that the sessions were not boring, as these were interactive. The whole activity improved memory recall. The faculty members said that the teaching learning strategy using storytelling proved very informative. They also mentioned that the science and health concepts were well embedded in the stories. The research showed that the use of storytelling as a teaching learning strategy is effective for Dengue principle and Dengue prevention concept disseminations. **(Author's abstract)**

Keywords: *Dengue, Elementary level, Experimental design, Health education, Metro Manila, Preschool, Storytelling, Medicine*

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0579

Structure of HIRAN domain of human HLTF bound to duplex DNA provides structural basis for DNA unwinding to initiate replication fork regression

Hishiki, Asami, Sato, Mamoru, Hashimoto, Hiroshi

Replication fork regression is a mechanism to rescue a stalled fork by various replication stresses, such as DNA lesions. Helicase-like transcription factor, a SNF2 translocase, plays a central role in the fork regression and its N-terminal domain, HIRAN (*HIP116* and *Rad5 N-terminal*), binds the 3'-hydroxy group of single-stranded DNA. Furthermore, HIRAN is supposed to bind double-stranded DNA (dsDNA) and involved in strand separation in the fork regression, whereas structural basis for mechanisms underlying dsDNA binding and strand separation by HIRAN are still unclear. Here, we report the crystal structure of HIRAN bound to duplex DNA. The structure reveals that HIRAN binds the 3'-hydroxy group of DNA and unexpectedly unwinds three nucleobases of the duplex. Phe-142 is involved in the dsDNA binding and the strand separation. In addition, the structure unravels the mechanism underlying sequence-independent recognition for purine bases by HIRAN, where the N-glycosidic bond adopts syn conformation. Our findings indicate direct involvement of HIRAN in the fork regression by separating of the daughter strand from the parental template. **(Author's abstract)**

Keywords: *Crystal structure, DNA damage response, Protein–DNA interaction, Replication fork regression, Template switching, Medicine*

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0580

Successful management of uterine arteriovenous malformation by laparoscopic bilateral uterine artery ligation

Tan Cardoso, II, German C., Nano, Nerissa Gracia G., Matundan, Kather

Arteriovenous Malformations are vascular disorders where there is an abnormal communication between an artery and vein. It can occur anywhere in the body not even sparing the uterus. Uterine Arteriovenous Malformations (AV Malformation) is a rare occurrence with less than 100 cases reported in literature. It can cause significant bleeding leading to anemia and even hypovolemic shock. It may be acquired from previous uterine manipulation such as dilatation and curettage and previous uterine surgeries. Diagnosis is made by angiography or doppler ultrasonography. Definitive treatment is hysterectomy however a less invasive, fertility preserving are uterine vascular occlusion techniques, of which the treatment of choice is Uterine Artery Embolization (UAE). We present our experience with 24 year-old G2P2 (1101) with scarred uterus suffering from recurrent profuse vaginal bleeding suspected to have uterine arteriovenous malformation. Laparoscopic bilateral uterine artery ligation, an alternative, more economical, relatively safe and available treatment option was given to the patient. **(Author's abstract)**

Keywords: *Uterine arteriovenous malformation, Uterine artery embolization, Abnormal uterine bleeding, Medicine*

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0581

A successful pregnancy after two fertility-sparing surgeries for borderline ovarian tumor

Manabat, Manuel S. , Espino-Strebel, Elizabeth E. , Mendiola, Patricia

Low malignant potential serous tumors are the most common subtypes of non-benign serous tumors in the young, usually confined to one or both ovaries. To preserve ovarian function and fertility conservative management can be performed. Although recurrence is higher than that after a completion surgery, the rate of recurrences continues to be debated. Most recurrent diseases are of the same histopathology as the initial tumor and adequate excision of the recurrent tumor can be done.

A 31-year old, primigravid underwent bilateral oophorocystectomy for serous borderline ovarian tumor stage IB. After 3 years she had tumor recurrence and another fertility-sparing surgery consisting of left salpingo-oophorectomy and contralateral cystectomy was done. Histopathology was a recurrent borderline ovarian tumor. Two years later, she had a spontaneous pregnancy and delivered to a live term baby. This is a reported case of a successful pregnancy after two fertility-sparing surgeries for borderline ovarian tumor. **(Author's abstract)**

Keywords: *Borderline ovarian tumor, Low malignant potential, Fertility-sparing surgery, Conservative treatment, Pregnancy, Medicine*

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0582

Targeted Sequencing of Mixed Neuroendocrine- Non-neuroendocrine Neoplasm of the Gallbladder Suggests a Monoclonal Origin: A Case Report

Sta. Ines, Flora Mae

Mixed neuroendocrine-non-neuroendocrine neoplasm (MiNEN) of the gallbladder is a rare tumor that is defined in the World Health Organization (WHO) 2019 digestive system tumor classification as the presence of a neuroendocrine neoplasm admixed with a non-neuroendocrine carcinoma, each component constituting at least 30% of the neoplasm. The exact pathogenesis of MiNENs remains unclear. We present a case of a 74-year-old Filipino woman who presented with nonspecific clinical and radiologic findings and subsequently underwent cholecystectomy. Histopathologic and immunohistochemical evaluation of the gallbladder confirmed the diagnosis of a mixed well-differentiated adenocarcinoma (30%) and large cell neuroendocrine carcinoma (70%). The adenocarcinoma and neuroendocrine carcinoma components were separately microdissected and submitted for targeted 15-gene sequencing using the Illumina Trusight Tumor 15 (TST15) panel. NGS identified a TP53 missense mutation leading to a stop codon in both components. The finding of similar molecular signatures in the two morphologically distinct components supports the hypothesis that MiNEN arises from a common precursor stem cell capable of divergent phenotypic differentiation.

Keywords: *gall bladder, MiNEN, molecular analysis, Medicine*

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0583

Transabdominal Amnioinfusion In Preterm Prelabor Rupture Of Membrane: A Case Report

Lozada-Pascual, Joanna Zerline , Oconer, Ev

Premature prelabor rupture of membranes (PPROM) is defined as rupture of membranes before 37 completed weeks. The diagnosis of rupture of membranes can be made by using sterile speculum examination. Amniotic fluid is seen pooling in the posterior fornix or clear fluid is passing from the cervical canal. Presented is a case of PPROM which was managed with transabdominal amniotransfusion. The effects of amnioinfusion on pregnancy outcome in preterm premature rupture of membranes (PPROM) are unclear. Postulated benefits include prolongation of the latency period and prevention of pulmonary hypoplasia and infection. Transabdominal amnioinfusion is a promising procedure. It can be a very useful procedure in special cases, such as, preterm prelabor rupture of membrane to improve neonatal survival and outcome. **(Author's abstract)**

Keywords: *Transabdominal amnioinfusion, Premature prelabor rupture of membranes (PPROM), Pulmonary hypoplasia, Medicine*

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NP

0584

Transcervical foley catheter versus laminaria: A randomized controlled trial comparing efficacy and safety in facilitating cervical dilatation in cases of molar pregnancies

Soriano-Estrella, Agnes L. , Adolfo, Raq

Objective: This study aimed to compare the efficacy and safety of foley catheter versus laminaria in facilitating cervical dilatation among patients with molar pregnancy.

Methods: This was a randomized controlled trial carried out from September 1, 2013 to September 30, 2014. Fifty-two patients with hydatidiform mole were randomly allocated to either the control or treatment group. Laminaria was used in the control group to facilitate cervical dilatation prior to molar evacuation while foley catheter was used in the treatment group. The primary outcome was the rate of successful cervical dilatation. Amount of bleeding, level of pain, presence of foul smelling vaginal discharge, and febrile episode were noted. The two-tailed Wilcoxon rank sum test was used to determine difference between the two groups.

Results: A significantly higher rate of successful cervical dilatation was seen in the foley catheter group (1.6 mm/hr vs 1 mm/hr), as evidenced by shorter duration from placement of mechanical dilator to successful cervical dilatation (9.5 hours vs 12 hours) and the lack of need for insertion of additional cervical dilator (0 vs 1). Compared to laminaria, foley catheter took a significantly shorter time to insert (5 mins vs 1 min) and was significantly less painful (VAS 5 vs VAS 0). Estimated blood loss, relative risk for pelvic pain, febrile episodes, profuse bleeding, and foul smelling discharge did not differ significantly between the two groups.

Conclusion: Foley catheter may be an alternative in facilitating cervical dilatation for molar pregnancies. Foley catheter has the advantage of being readily available, with lower cost and lack of systemic or serious side effects. **(Author's abstract)**

Keywords: *Hydatidiform mole, Laminaria, Foley catheter, Mechanical induction of labor, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 39 Issue No. 4, 1-7
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(Filipiniana Analytics)
NP

Transverse myelitis preexisting in pregnancy: A case report

Galang, Katherine Abigail P., Lim, Catherine Grace

Transverse myelitis is an acute inflammatory lesion of the spinal cord resulting in motor, sensory, and autonomic dysfunction. Pregnancy increases risk of complications depending on the level of the spinal cord lesion. Hence, a multidisciplinary approach is needed during prenatal period. This is a case of IB, a 32 year-old primigravid, a known case of Transverse Myelitis, initially seen at ten weeks age of gestation. Prenatal course was managed accordingly. She underwent primary cesarean section for arrest in cervical dilatation at 39 weeks, with an unremarkable post-operative course. There is an increased risk of preventable complications such as recurrent urinary tract infections, anemia, development of decubitus ulcers, premature labor and delivery and autonomic dysreflexia. It is imperative that during the prenatal period, the patient be monitored closely and referred to specialists for further management of these simple to fatal complications. **(Author's abstract)**

Keywords: *Complications, Multidisciplinary approach, Pregnancy, Transverse myelitis, Medicine*

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NP

Tubal ligation and salpingectomy and the risk of epithelial ovarian cancer: A case-control study

Toral, Jean Anne B. , Tingne, Cyriel Anth

Background: Epithelial ovarian carcinoma is the most lethal of the gynecologic malignancies. Recent theories on the etiopathogenesis of epithelial ovarian carcinoma supported the presence of occult, early stage neoplasms in the fimbriated end of the fallopian tube even before development of ovarian carcinoma. This study is interested in correlating opportunistic salpingectomy or tubal ligation as a possible effective prevention strategy in the occurrence of epithelial ovarian carcinoma.

Objective: To determine the association between the occurrence of epithelial ovarian carcinoma and a previous history of tubal ligation and/or salpingectomy

Methods: This is a case-control study involving chart review of patients who underwent total hysterectomy with bilateral salpingoophorectomy with a histologically verified epithelial ovarian cancer (cases) and patients who underwent same surgical procedure for benign gynecologic conditions specifically myoma uteri and adenomyosis with normal ovaries on final histology report (controls). The association between the occurrence of epithelial ovarian carcinoma and previous tubal ligation and/or salpingectomy was determined using appropriate statistical methods.

Results: A total of 558 patients were included in this review. They were divided into 158 post-surgical patients with histologically verified epithelial ovarian cancer (cases) and 400 post-surgical patients for benign gynecologic conditions with normal ovaries on final histology report (controls). Adjusted for age, parity and obesity the odds of developing epithelial ovarian carcinoma in subjects without previous tubal ligation and/or salpingectomy is 29%.

Conclusion: The result of the study showed that tubal ligation and/or salpingectomy reduces the risk of

developing epithelial ovarian carcinoma hence for patients at average risk of ovarian cancer, risk-reducing salpingectomy should be discussed and at the time of abdominal or pelvic surgery. It must also be included in the counseling of women planning a hysterectomy for benign indications to conserve ovarian function and prevent ovarian epithelial carcinoma. **(Author's Abstract)**

Keywords: *Epithelial ovarian carcinoma, Tubal ligation, Prevention, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 1, 12-17
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(Filipiniana Analytics)
NP

0587

Twisted fate: Successful management of hypovolemic shock due to abruptio placenta secondary to uterine torsion complicated by unilateral absence of adnexa

Melchor, Kimberly Christine B., dela Concepcion-Co, Lily R

Uterine Torsion is defined as rotation of the uterus of more than 45 degrees on its long axis. It is an unusual complication of pregnancy and for most obstetricians, it probably represents “once-in-a-lifetime” diagnosis. A 32-year old multipara at 30 week gestation with abdominal pain is presented. Laparotomy was performed for the diagnosis of hypovolemic shock secondary to suspected abruptio placenta. Intraoperatively, uterine torsion was observed with unilateral absence of the right adnexa. Prompt decision making with aggressive immediate management resulted to favorable maternal outcome. **(Author's abstract)**

Keywords: *Adnexal absence, Absent fallopian tube, Absent ovary, Uterine torsion, Abruptio placenta, Medicine*

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0588

Unexpected acute respiratory failure following administration of rocuronium bromide during cesarean delivery in a severely preeclamptic parturient treated with magnesium sulfate

Armavit, Erlinda N. , Macalintal, Joseph C

Magnesium sulfate has been a mainstay in the management of preeclampsia and is associated with a decreased incidence of morbidity and mortality. The hypertensive disorder has an unpredictable course, sometimes rapidly evolving to full-blown disease. In patients with deteriorating status, it is indicated to terminate the pregnancy via cesarean section. The anesthesiologists would prefer to have the procedure done under regional anesthesia; however, there may be cases when neuraxial anesthesia is contraindicated, or a general anesthesia would permit prompt delivery of the fetus.

A patient with severe preeclampsia was given magnesium sulfate intrapartum, wherein a primary cesarean section was indicated for arrest in cervical dilatation, and was performed under general anesthesia. The patient developed acute respiratory failure and the causes of this occurrence were investigated in this report. It was later found out that neither the hypermagnesemia nor the muscle relaxant alone caused the patient's condition but the interaction between the

two. The patient was managed expectantly at the intensive care unit (ICU) and was eventually extubated during the first post-operative day. Knowledge of this drug interaction would allow obstetricians to advise their patients and their family about the possibility of prolonged intubation and ICU admission. This would also bring to the anesthesiologists' attention the need to decrease the dose of muscle relaxant and to prepare drugs for immediate decurarisation. **(Author's abstract)**

Keywords: *Magnesium sulfate, Preeclampsia, Eclampsia, Preeclampsia with severe features, Rocuronium, Medicine*

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NP

0589

Uterine Arteriovenous Malformation in Pregnancy: A Case Report

Soriano-Estrella, Agnes L. , Elauria, Jean Ail

Background. Uterine arteriovenous malformation (AVM) is a web of arteries and veins lacking an intervening capillary network. Color flow Doppler is a popular method of diagnosis of uterine AVM. The definitive management is hysterectomy. However, for patients desirous of pregnancy, transarterial embolization is a safe and effective option. Although rare, uterine AVM can complicate pregnancy with torrential bleeding due to hormonal changes and significant remodeling of the myometrium.

Case. We report a case of a term pregnancy in a 33 year old with a uterine AVM and a previous transarterial embolization procedure who developed a uterine AVM during multi-agent chemotherapy for gestational trophoblastic disease. She consulted for prenatal checkup. Due to the risk of massive bleeding during labor, she underwent elective cesarean section at term and delivered a baby with good outcome.

Conclusion. This case suggests that uterine AVM in pregnancy can be managed conservatively with serial ultrasound monitoring and close follow up. **(Author's abstract)**

Keywords: *Uterine arteriovenous malformation (AVM), Transarterial embolization, Pregnancy, Gestational trophoblastic neoplasia, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 39 Issue No. 1, 29-34
2015 March,
(Filipiniana Analytics)
NP

0590

Utilization of Allogeneic Red Blood Cell Units in Elective Gynecologic Surgeries

Inocian, Edsel P., Ruelan, Richard

This research determined the pattern and indices of blood usage, and the relationship between elective gynecologic surgeries and utilization of allogeneic red blood cell units in a tertiary retained hospital in Cebu City, Philippines. All patients who underwent elective gynecologic surgeries admitted from October 1, 2008 to December 31, 2008 were included in this study. This 3-month study utilized a descriptive-correlational research design. A total of 63 patients underwent elective gynecologic surgeries during the study period. A total of 150 red blood cell units were ordered, but only 142 units were procured. All units were cross-matched but only 52 units were transfused. The overall frequency of blood transfusion related to elective gynecologic surgery was 30.37%. This meant that

69.63% of the blood was not utilized. Ten patients needed preoperative transfusions because of preexisting anemia, eight because of excessive bleeding during surgery, and nine had postoperative transfusions. The overall cross-matched/transfusion ratio of 2.73 revealed insignificant blood utilization. However, the probability of transfusion of 31.74% and the index of transfusion of 0.86 were indicative of significant utilization. There was inefficiency in the ordering of allogeneic red blood cell units in elective gynecologic surgeries. However, there was an appropriate number of units ordered for the patients. Moreover, a pre-operative cross-match was required for the procedure. Lastly, the type of surgery was not a determinant in the blood utilization. **(Author's abstract)**

Keywords: *Allogeneic, Red Blood Cell Units, Cross-matching, Ordering, Transfusion, Elective, Gynecologic, Surgery, Cross-match transfusion ratios, Transfusion probability, Transfusion index, Medicine*

CNU Journal of Higher Education, Volume No. 5 Issue No. 1, 94-111
2011,
(Filipiniana Analytics)
NP

0591

Vaginal agenesis: A case report
Alcantara, Marie Janice S. , Barinaga, Sigrid A. , Tan, Rey

Congenital anomalies of the vagina are rare congenital anomalies. Women born with this anomaly present with collection of blood in the uterine cavity or hematometra and pelvic pain. Presented is a case of a 12-year old girl with hypogastric pain and primary amenorrhea complicated by vaginal agenesis. She was managed conservatively by creating a neovagina with the use of bipudendal flap or Modified Singapore flap. Management can be non-surgical or surgical but the management of congenital vaginal agenesis remains controversial. The decision to do a conservative surgical procedure or a hysterectomy depends on the clinical profile of the patient, the expertise of the surgeons, the extent of the anomaly, and its association to other congenital anomalies. **(Author's abstract)**

Keywords: *Vaginal Agenesis, Hematometra, Primary Amenorrhea, Modified Singapore flap, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 40 Issue No. 3, 34-40
2016 September,
(Filipiniana Analytics)
NP

0592

Vaginal versus cesarean breech delivery: maternal and neonatal outcomes at Bulacan Medical Center – a two-year retrospective study
San Pedro, Alejandro R. , Galiza, Rodante P. , Teotico, Angelita R. , Delos Santos-Borgonia, Jeric

Objective: To compare the maternal and neonatal outcome of vaginal and cesarean breech deliveries at Bulacan Medical Center

Materials and Methods: A two-year retrospective descriptive study on all patients who delivered breech by vaginal or cesarean section from January 1, 2012 to December 31, 2013. The maternal and neonatal outcomes were compared and analyzed.

Results: There were 165 deliveries included during the study period. There were 83 cases of vaginal breech delivery and 82 cases of cesarean breech delivery. The incidence and risk of postpartum hemorrhage is higher among cesarean breech delivery (7%). Febrile morbidity($p=0.0223$) is significantly lower for vaginal breech

births. Cesarean breech delivery is correlated with longer hospital stay ($p < 0.0001$). There were no significant differences on the incidence of asphyxia (5% vs 2%, RR=0.51, RD=-2%, $p=0.4141$), birth trauma (2% vs 1%, RR=0.51, RD=-1%, $p=0.5673$) and sepsis (12% vs 9%, RR=0.71, RD=-4%, $p=0.4582$) for vaginal or cesarean breech delivery. Prolonged hospital stay is 2.10 times more likely to occur for cesarean breech deliveries compared with vaginal breech deliveries. Thus, shorter hospital stay means lesser hospital costs for both mother and babies.

Conclusion: There is no significant difference in maternal and perinatal morbidity and mortality between vaginal and cesarean breech delivery except for longer hospital stay and increased febrile morbidity for cesarean births. It is therefore safe to recommend vaginal breech delivery under hospital-specific guidelines for labor management such as strict selection of patients, high quality fetal monitoring and high level of competence among obstetricians to deliver breech. **(Author's abstract)**

Keywords: *Breech, Cesarean section, Pregnancy complications, Pregnancy outcome, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 39 Issue No. 2, 11-16
2015 June,
(Filipiniana Analytics)
NP

0593

The Wayward Seed: An Ectopic Gestation in a Cesarean Section Scar

Perez, Paula Patricia P., Pichay, Regta

Pregnancy implantation within the scar of a previous caesarean delivery is the rarest location for an ectopic pregnancy. With increasing incidence of cesarean section worldwide, more and more cases are diagnosed and reported. A 36 years of age, Gravida 3 Para 1 (1-0-1-1) with a CS delivery and one completion curettage for abortion presented with hypogastric pain and vaginal spotting. She was admitted with an impression of Missed Abortion at eleven weeks age of gestation. Initial scan showed embryonic fetal demise, eight weeks and two days by crown to rump length (CRL) for which completion curettage was planned. On her 3rd hospital day, evacuation curettage was attempted. It was aborted when profuse vaginal bleeding ensued upon the insertion of the hysterometer. Carbetocin 100 mcg/IV and Tranexamic acid 1gm/IV were given to control the bleeding. Repeat scan showed Abortion in progress eight weeks and one day by CRL; Abortus was noted at the lower uterine segment and cervical canal. On her 4th hospital day, evacuation curettage was rescheduled with anesthesia assist, however the profuse bleeding that resulted when a piece of tissue was grasped with an ovum forceps, cautioned the operator not to proceed further. Hemorrhage was controlled with an intrauterine balloon tamponade, antifibrinolytics and carbetocin. Suspicious of the presence of an ectopic gestation, emergency ultrasound was requested showing features of CS scar pregnancy. She underwent medical management with methotrexate and exhibited a successful outcome. The case presented aims to highlight the difficulty of diagnosing CS scar pregnancy clinically and by sonography. The importance of having a high index of clinical suspicion in women with risk factors, the pathophysiology, appropriate methods of diagnosis and timely intervention are likewise emphasized. A delay in diagnosis and/or treatment of this rare event can lead to serious maternal morbidity and even death. **(Author's abstract)**

Keywords: *Cesarean section, Scar, Ectopic, Methotrexate, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 38 Issue No. 3, 22-30
2014 September,
(Filipiniana Analytics)
NP

NUTRITION

Full title- *In vitro* digestibility, amino acid profile and antioxidant activity of cooked Bambara groundnut grain

Oyeyinka, Adewumi Toyin , Pillay, Kirthee , Siwela, Muthulisi

The effect of wet cooking on the nutritional and functional properties of two Bambara groundnut landraces and a reference dry bean was studied. Wet cooking increased the amino acid concentration of the Bambara landraces for most of the amino acids tested, but the methionine content of the two Bambara landraces and the reference bean decreased by approximately 90, 90 and 20%, respectively. Carbohydrate and fiber contents of all the samples increased after cooking. Cooking led to a significant increase in the total phenolic content of the grains and decreases in phytic acid and tannin contents, which seems to have resulted in an increase in the *in vitro* starch and protein digestibility of all the samples. Thermal processing had varying effects on the conformation of proteins as observed in the FTIR spectra of each sample. However, nutrients were well retained and antinutrients reduced significantly. **(Author's abstract)**

Keywords: *Wet cooking, Bambara groundnut, Vigna subterranea, Antinutrients, Protein digestibility, Nutrition*

Food Bioscience, Volume No. Issue No. , 1-10
2019,
(Filipiniana Analytics)
F(S) TP248.65.F66 F66 n31 2019

Nutritional composition and angiotensin converting enzyme inhibitory activity of blue lupin (*Lupinus angustifolius*)

Chin, Ying Yee , Chew, Lye Yee , Toh, Gaik Theng , Salampessy, Junus , Azlan, Azrina , Ismail, Amin

The nutritional, protein and amino acid compositions of blue lupin (*Lupinus angustifolius*) flour were studied. The angiotensin converting enzyme (ACE) inhibitory activity of lupin protein isolate (LPI) hydrolysates prepared using Alcalase and Flavourzyme, and the Osborne protein fractions hydrolysates prepared using Alcalase were determined. Lupin flour was high in protein (43â€g/100â€g) and dietary fiber (34â€g/100â€g) but low in carbohydrate (4.8â€g/100â€g) and ash (3.4â€g/100â€g). Results from a sequential Osborne extraction procedure showed that lupin protein was comprised of 56% globulin, 26% albumin and 19% glutelin, while prolamin was only found in trace amounts. Lupin protein was high in Lys but limiting in Met. SDS-PAGE analysis suggested that protein hydrolysis catalyzed using Alcalase was more effective than Flavourzyme as shown by the presence of lower molecular weight peptides in the former. LPI hydrolysates prepared using Alcalase showed high ACE inhibitory activities with IC50 values ranging from 0.10 to 0.21â€mg/ml. The results suggested that the globulin fraction was the main contributor towards the ACE inhibitory activity observed in lupin protein. **(Author's abstract)**

Keywords: *ACE inhibitory activity, Alcalase, Blue lupin, Flavourzyme, Lupinus, Osborne protein fractions, Nutrition*

Food Bioscience, Volume No. Issue No. , 1-10
2019,
(Filipiniana Analytics)
F(S) TP248.65.F66 F66 n31 2019

Determination of the Golden Ratio in Selected 16th to Mid - 19th Century Churches of Panay Island, Central Philippines

Clement, Josh Thomas , Josue, Ryan Izach , Ledesma, Kyle Jeremiah , Lurga, Jonathan , Madrinan, Joseph Simon

Using numerical analysis and geometric construction, this study aimed to find out whether the Golden ratio is present in churches constructed during the 16th to mid-19th century in Panay, an island in central Philippines. The study focused on churches that met the criteria set by the National Historical Commission of the Philippines as historically significant namely: Pan-ay Church, Sta Barbara Church, and Jaro Cathedral. A measuring device, that utilizes a laser, was used to take measurements. The values obtained were used to construct a floor and facade plan then proportionalized to determine their ratios within five percent error margin of the Golden ratio were observed which showed that all three churches sampled exhibited the Golden ratio. However, access to historical documents is needed to conclude a purposeful intent of using the Golden ratio in the churches design.

(Author's abstract)

Keywords: *Golden Ratio, Illustration, Procurement, Numerical Analysis, Geometric construction, Percent deviation analysis, Physics*

Publisceance A Research Journal of High School Researches, Volume No. 1 Issue No. 1, 21-26
2018 May,
(Filipiniana Analytics)
Fil (S) Q76 P45 1/1 2018

The Use of Convex Lens as Primary Concentrator for Multi-Junction Solar Cells

Barrios, Juan Paolo Lorenzo Gerardo , Cortez, John Raffy , Herman, Gene Michael , Larroder, Aris , Jeco, Bernice Mae Yu , Watanabe, Kentaroh , Okada, Yoshitaka

A concentrator lens system was designed for a multi-junction solar cell, CD0-100-C3MJ, with an added feature-a convex lens was added above the Fresnel lens, in order to improve the efficiency of the setup. The convex lens setup was tested with the Fresnel lens setup over a three-day photoperiod by measuring the voltage, current, irradiance, and temperature at every hour. The results showed that the convex lens setup produced 1.04 percent more power, but only at around midday. The power difference caused by the convex lens was determined by the Wilcoxon Signed Test to be significant for the photoperiod, as it focuses a greater amount of sunlight on the solar cell over the course of the day. **(Author's abstract)**

Keywords: *Solar cells, Convex Lens, Solar Energy System, Physics*

Publisceance A Research Journal of High School Researches, Volume No. 1 Issue No. 1, 1
2018 May,
(Filipiniana Analytics)
Fil (S) Q76 P45 1/1 2018

Design study of gyro-stabilized, remote-controlled weapon station*Telen, Mary An*

Weaponry is a crucial element in the battlefield. Artillery should be stable and steady when it is fired to the target. However, when the target is moving, artillery becomes a challenge for the shooter to lock its target; the same case when the shooter is moving. Accuracy and precision is a must to avoid casualties and reserve resources. Hence, this study designed a weapon dock that is controlled remotely to have a stable aim on the target. The technology used sensors called gyroscope that is responsible for indicating change of direction and stabilization. A joystick was used as a remote controller for the pitch and yaw which help the shooter to point and lock its target for better accuracy. Quantitative results were gathered from gyro and joystick that aid the researchers to record errors and inaccuracy in the system which served as the baseline for the stabilization controller to correct. The study achieved the stabilized disturbance with its best response time of at least 630ms which may be improved with fast motor and self-tuning fuzzy proportional-integral-derivative (PID) controller.

Keywords: *weaponry, weapon station, remote controlled, gyro-stabilized, gyroscope, joystick, proportional-integral-derivative controller, stabilization controller, Science and technology*

Mindanao Journal of Science and Technology, Volume No. 15 Issue No. 1,
2017,
(Filipiniana Analytics)

Challenges, difficulties, and opportunities of nurses during COVID-19 pandemic: an assessment of disaster nursing care experience*Anastacio, Angel*

This is a descriptive qualitative study using phenomenological approach involving 46 nurses working in hospitals that cater to COVID-19 patients. This was conducted in April 2020. Results show that the challenges of nurses during the tour of duty in COVID-19 wards include physical, procedural, psychological and protection. Likewise, nurses uncovered some difficulty with regard to the following experiences: struggle to be in complete PPE and with lack of PPE, not always being able to provide timely care, increased workload, nursing care limitations, their risk to safety and having anxiety. This most often leads to some opportunities that bridge the gap towards achievement of their personal development and professional growth, as such, nurses became more compassionate, confident, resilient and resourceful, altruistic, and developed a stronger faith in God. Their leadership skills were also enhanced as they learned new knowledge and enhanced skills through education, trainings and experience. All the challenges and difficulties became avenues for the nurses to be able to unleash their potentials and further develop them into God fearing and humane health care providers. Furthermore, the nurses being in the forefront of health care should be given assurance of safety and protection. Likewise, the nurse should closely adhere to standard protocol designed for COVID-19 infection control. It is, thus, recommended that there should be effective communication system to address issues and resolve conflicts. Lastly, emotional support and positive feedback should be given to nurses during the critical situations in the ward and collaborative working environment should be established all the time.

Keywords: *COVID-19, Filipino nurses, nursing care, pandemic, challenges, opportunities, difficulties, health emergency, Social sciences*

0600

Decent work for a decent world for Filipino domestic workers: a case study into the implementation of the Philippinesâ€™ Batas Kasambahay
Puno-Resurreccion, Carol Ann

In the Philippines, the emergence of service-oriented and technology-driven industries, such as the BPO industry, provided women with the opportunity to enter (or re-enter) the labor force as salaried workers. Within this, traditional tasks, such as household work, child care and rearing, were left into the hands of domestic workers, colloquially called katulong or kasambahay. ILO Convention 189, or the Domestic Worker's Protection Convention, calls on countries to adopt labor standards that will allow domestic workers equal access to decent employment and other productive opportunities (ex. skills upgrading, continuing education). Putting domestic work at par with other occupational categories in the formal sector, the said Convention, and the subsequent release of Recommendation 201, hopes to end the precarious nature of this type of work, which includes among others child domestic labor. The enactment of Republic Act No. 10361, also known as Batas Kasambahay, spells out the Philippines' commitment to protect locally employed domestic workers. This study assessed whether the said law provided adequate social and labor protection to the kasambahay. The Department of Labor and Employment (DOLE) and its implementation of Batas Kasambahay was the highlight of this study. Through an environmental scan and the conduct of key informant interviews, this study specifically evaluated how policies and initiatives enacted by DOLE had been mainstreamed. The output is a policy analysis, with a list of recommendations, which the DOLE and other researchers interested in labor laws may further explore.

Keywords: *Philippines, Batas Kasambahay, domestic worker, labor standards, labor protection, social protection, policy analysis, Department of Labor and Employment, Social sciences*

0601

Dummy entry: for testing only
Dela Cruz, Juan

For *testing purposes* only, might delete later

Keywords: *dummy, testing, Social sciences*

Economic growth and environmental management in the Philippines

Estadilla, Lean

Economic growth has been the objective of every administration. Changes in its structure, especially the positive ones, would have a significant effect on a citizen's way of life. For example, an increase in the wealth of an economy would soon translate into a better standard of living of its citizenry in the future (Mankiw, 2017). This economic phenomenon pushes different economists to formulate policies that would help the economy grow and avoid an economic downturn, recession or worst depression. The Philippines, an archipelago and endowed with natural resources, is showing positive development economically. In recent years, it registered increases in its Real Gross Domestic Product (GDP real) and is now comparable in terms of annual growth experienced by other neighboring ASEAN countries (www.psa.gov.ph). But this development is sometimes attained at the cost of the environment. Some environmentalists suspect that rampant efforts to achieve economic growth would result to environmental degradation. This is now a worldwide problem experienced even by developed nations. This study sought statistical evidences on the relationship between economic growth (GDP real) and environmental management (Environmental Performance Index (EPI)) in the Philippines. The researcher used panel data from 2000 to 2018 gathered from World Bank (www.data.worldbank.org) and Yale University (www.epi.envirocenter.yale.edu). This also attempted to determine if the Environmental Kuznets Curve (EKC) is evident in the country. Having applied trend regression analysis, it was revealed that in the case of the Philippines, there is a moderate positive relationship between GDP real and EPI. This result supports the fact that in experiencing growth in an economy, the country will experience an improvement in the development and protection of the environment. It was also found out that over the past two decades, the Philippines experiences EKC. In 2000, environmental protection in the country is low, but it started to increase in 2006 through 2016. However, it declined in the past two years. Thus, it is suggested that in crafting new and continuing existing economic policies, the government should ensure that natural resources are unharmed and further enhancement of existing policies should be considered for the conservation of the natural resources.

Keywords: *economic growth, economic policy, Real Gross Domestic Product, environmental management, Philippines, Social sciences*

International Journal on Social Innovation & Research, Volume No. 11 Issue No. 1,
2020,
(Filipiniana Analytics)

Emotion dysregulations as mediator on the relationship of perfectionism and suicidal desire

Bacal, Rhianna Cha

Suicide cases have been prevalent in college students nowadays. The high standards placed upon them by society or themselves contribute to an individual's suicidal desire. Perfectionists tend to have deficits in emotion regulation and emotionally dysregulated individuals have higher risks for suicidal desire. This study provides an analysis and evaluation of how emotion dysregulation mediates the relationship of perfectionism and suicidal desire. A survey was conducted among 200 college students. Mediation analysis using Model 4 of the Conditional Process Analysis by Hayes and Sobel test was used to analyze the data. Results of the data show that all relationships are significant. In particular, perfectionism was found to be a predictor of suicidal desire. Moreover, emotion dysregulation partially mediates between perfectionism and suicidal desire. The study finds that college students have high standards for themselves and failure to achieve these may lead to suicidal desire. The study also finds that college students do not regulate their emotions well when not meeting their standards which may lead to a person's suicidal desire.

Keywords: *emotion dysregulation, perfectionism, suicidal desire, Social sciences*

Engaging the community through virtual mobilization during the COVID-19 pandemic
Bracamonte, Ni

The world comes to a halt with the COVID-19 pandemic as it speeds in annihilating the human population and causing enormous sufferings. Both the local and global economy are affected by this pandemic's devastating impact to health and, eventually, to social aspects of life. The working class and the disadvantaged sector, especially daily wage earners and unemployed, bear the brunt of amplified poverty arising from enforced community quarantine and militarized lockdown. In this essay, I present my experience as community organizer, a senior citizen who is prohibited from going out during the quarantine period, and how I utilized the online platform to continue my extension work. In doing this, I provide my experience working (1) on the Personal Protective Equipment (PPE) project; (2) with the Bajau community of Iligan City; and (3) with the Meranaw IDPs. In this essay, I wish to communicate to all community extension workers that the pandemic is a cheap reason to justify not continuing with our extension work.

Keywords: *COVID-19, pandemic, virtual mobilization, personal protective equipment, online platform, health emergency, economic emergency, Social sciences*

The Japan-Philippines Economic Partnership Agreement, a Decade After: Evaluating the Impact on Philippine Trade
Quimba, Francis M

The Japan-Philippines Economic Partnership Agreement (JPEPA), the first bilateral FTA that the Philippines entered into, aims to facilitate and promote free transborder flow of goods, services, capital, and people between the two countries. This paper explores the use of synthetic control method to understand the effects of JPEPA on Philippine exports. The results reveal that the Philippines benefited from the JPEPA as determined by the difference in the actual exports and the counterfactual exports.

Keywords: *JPEA, Japan-Philippines Economic Partnership Agreement, Free Trade Agreement, transborder flow of goods, Philippine exports, Trade and industry, Social sciences*

The orality and orthopraxy of the adherents of the primal religion

Eres, Bernaldo P., Ph.D.

This study examines the Orality and Orthopraxy of the adherents of Primal Religion (PR) in Negros Occidental. There are two (2) groups and sub-groups of medicine people of indigenous in character being studied/investigated for the Negrosbased believers of PR. The Non-structured (NSPs) and Structured participants (SPs) are working for spiritual healing in two separate worldviews. The former are the spiritual leaders and fraternity who are working closely with the Church's sponsored health programs. The latter are the group of faith healers who are conducting the traditional spiritual healing without the influence of the official religion. They are composed of the local shaman manughilot/manugluy-a with single and multi-function activities in conducting the spiritual healing. Furthermore, this study brings nuances to the worldview found among the cultural carrier of PR in Negros Occidental long before the western missionaries came into the Negros Island. Moreover, the comparative analysis which is the inter-play between the NSPs and SPs, gives a new breathe of religious ideas drawn out of reflection in an emerging and unique culture of shamanism in Negros Occidental.

Keywords: *orality, orthopraxy, primal religion, Social sciences*

Luz y Saber, Volume No. 1 Issue No. 1,
2007,
(Filipiniana Analytics)

Participatory Governance Institutions for Social Housing in the Philippines: Do Local Housing Boards Matter?

Ballesteros, Mar

This study documents the application of participatory governance for social housing in the Philippines through the local housing boards (LHBs), which are seen to have a crucial role in the adoption of inclusive social housing programs and policies. It shows that local government units (LGUs) vary in their implementation of the LHBs. For instance, the LHBs that serve only as clearinghouses for the eviction and demolition activities of some LGUs have a limited role as an institution for participatory governance. On the other hand, social housing policies and projects that cater to the poor are evident among LGUs with functioning LHBs.

Keywords: *land use, social housing, participatory governance, local housing board, urban development and housing, Social sciences*

Philippine Journal of Development, Volume No. 45 Issue No. 1,
2018,
(Filipiniana Analytics)

The quality world of institutionalized elderlies

Fullero, Gerrie M

This phenomenological study explored the Quality World of the elderlies living inside an institution called institutionalized elderlies. In Choice Theory, Quality World is part of the Perceived World and it is described as "personal picture album" of all the people, things, ideas, and ideals that individuals have discovered increase the quality of their lives, to fulfill a person's needs. Basic Human Needs are the general motivation for all behavior of human, the Quality World is the specific motivation. The Basic Human Needs describe what people need, the Quality World pictures detail how people meet those needs. Seven institutionalized elderlies were purposively recruited. Interview proceedings and interpretation of drawings were tape-recorded and were later on transcribed. Transcribed data was categorized and thematised into four thematic levels of the institutionalized elderlies Quality World. Findings of this study will be helpful in giving valuable inputs in the psychological utility of elderly's needs and wants using the lens of Choice Theory. Also, for the care providers and health professionals in the institution in providing a better assistance for the institutionalized elderlies.

Keywords: *phenomenological, quality world, institutionalized elderlies, perceived world, human needs, Social sciences*

Antorcha, Volume No. 6 Issue No. 2,
2019,
(Filipiniana Analytics)

Quarantining, contact tracing, and gossiping

Oracion, Enrique

It is a human right to travel and to move either temporarily as trader or permanently as migrant. The Philippine Constitution recognizes this right. However, there are certain cases and times when government can impose restrictions on travel. Individuals suspected of crime are barred from traveling outside the country. This is just one case that we commonly hear in the evening news. But there are also large-scale restrictions. The Philippines has documented large-scale travel restrictions, such as the cholera outbreak during the American Period. This largescale restriction is once again on us Filipinos because of the COVID-19 pandemic. There are many other countries which locked themselves, completely closed their borders from the rest of the world. Even internal travel was temporarily suspended. This essay presents scenarios in Negros Oriental, central Philippines created by the Philippine government's response to COVID-19, specifically quarantining, contract tracing, and how gossip figures out in this emergency situation.

Keywords: *COVID-19, quarantine, contact tracing, gossip, Philippines, migrant, travel restrictions, Social sciences*

Progressio Journal on Human Development, Volume No. 14 Issue No. 1,
2020,
(Filipiniana Analytics)

Social cohesion, trust, and government action against pandemics

Lofredo, Marlon Patr

The rapid spread of SARS-CoV-2 and its corresponding COVID-19 is challenging national preparedness and response-ability to pandemics. No one is prepared well, but governments around the world must respond as effectively and efficiently as possible to pandemics, and every occurrence of such worldwide disease must be a lesson for preparedness. While plans and programs may be in place to arrest the rapid spread of the virus, the success of any state intervention relies much on how cohesive the society is, how trusting the people are, and how trustworthy the government is. Social cohesion begets trust, and trust engenders obedience and calm. The absence of social cohesion produces social unrest and social erosion, lack or absence of social trust creates risk societies, disobedience. When these conditions exist, the spread of a virus is inevitable. Furthermore, they create a pandemic of confusion and fear, of stigmatization and discrimination. The ways that nations respond to the pandemic today and how the society responds to state actions will principally determine their lots and destinies in the next decades or even in the next elections. The pandemic reveals the quality of leaders and people a nation has. Governments that are successful at controlling the spread of SARS-CoV-2 and minimizing fatalities of COVID-19 will enjoy even more social cohesion and public trust, while those that deferred vigorous interventions to control its spread will see greater social stress and distrust, resulting in the paralysis of the public's faith in leaders and government institutions.

Keywords: *social cohesion, public trust, government action, pandemic, COVID-19, Philippines, Social sciences*

International Journal on Social Innovation & Research, Volume No. 11 Issue No. 1,
2020,
(Filipiniana Analytics)

Women's parliamentary representation in Malaysia, Philippines and Thailand

Capayas-Loquellano, Maria Filip

One of the most striking global trends in recent years is the growing number of women elected to the post of prime minister or president. However, this has not translated into an increased parliamentary representation. This is evident despite the fact that studies have shown that a higher number of women in parliament generally contribute to stronger attention to human development projects, such as education, health care, environment and consumer protection. Therefore, this formed the need for this research on the factors affecting women's participation in political leadership in parliament. The method utilized in the study was descriptive. Using purposive sampling, 45 women lawmakers in the parliaments of Malaysia, Philippines and Thailand participated in this research. They were chosen because of their own personal experiences in their countries' electoral systems. Based on the survey and interviews, findings showed that the respondents, women-lawmakers, considered campaign or funding resources the most influential factor when they decided to run or vie for seats in parliament while the least influential was ethnic bias. There was no significant difference in the factors affecting the respondents' representation when data were compared by nationality. Thus, it is recommended that women should be empowered by giving them due status, rights and responsibilities so that they could freely compete for parliamentary representation.

Keywords: *women empowerment, parliamentary representation, Malaysia, Philippines, Thailand, electoral system, human development, Social sciences*

International Journal on Social Innovation & Research, Volume No. 11 Issue No. 1,
2020,
(Filipiniana Analytics)

**Serologic Status of Newcastle Disease in Native Chickens by Hemagglutination
Inhibition Test**
Adlawon, Arlyn Ja

Newcastle disease (NCD) is a poultry disease caused by avian Paramyxovirus type 1, characterized by gastrointestinal, respiratory and neurological symptoms. The study established the prevalence of NCD in native chickens and evaluated the protection levels of vaccinated chickens. Blood serum samples were subjected to hemagglutination inhibition test. A total of 75 blood samples were collected from five sites in Davao City: 60 samples from four unvaccinated native chicken farms, and 15 from a vaccinated broiler farm. Results showed seven (7) unvaccinated native chickens with positive titer levels ranging from 2 to 32, of which two(2) were considered significant, indicating protection even without an elicited immune response. This cannot be simply attributed to environmental factors considering uniform exposure of other individuals to similar conditions but exhibited no positive titers. The significant titer count of vaccinated samples ranging from 16 to 128 is attributed to their vaccination history. Differences in titer levels despite similar vaccine administration indicate a disparity in levels of protection due to different individual antibody immune responses, and efficacy of vaccines. Analysis by Chi-square goodness of fit test showed no difference in the titer levels of native chickens, which was expected as they did not have previous exposure to NCD and most had no titers. The two significant titer levels were considered outliers and provided a possible genetic perspective with pre-immune antibodies and natural resistance of native chickens as the focus. Gene analysis and isolation, as well as the prevalence of NCD in other localities, are recommended for future studies.

Keywords: *Newcastle disease, Paramyxovirus type 1, native chicken, serology, hemagglutination inhibition test, Zoology*

SUBJECT INDEX

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