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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AGRICULTURE

0001

Adoption and Performance of Direct-seeded Rice (DSR) Technology in the Philippines

Aerone Philippe G. Bautista, Alice B. Mataia, Chona P. Austria, Marites M. Tiongco, and Alice G. Laborte

Manual transplanting is the traditional rice crop establishment method in the Philippines. Consequently, crop establishment comprises over 25% of the total labor cost that drives up rice production costs in the country. The study, therefore, assessed the socioeconomic effect of direct-seeded rice (DSR) as an alternative to transplanted rice (TPR), determined the trends and patterns of adoption of DSR, examined the economic performance of DSR relative to TPR, and identified the factors that influence DSR adoption. The rice-based farm households survey data from 1996/1997 to 2016/2017 showed that the proportion of DSR farmer-adopters increased from 27% in 1996/1997 to 33–42% in 2016/2017. The adoption of DSR resulted in lower labor use and cost in crop establishment and higher labor productivity. However, lower yield and higher seed and herbicide costs relative to TPR were its major trade-offs. Despite this, the partial budget analysis showed that shifting to DSR posed incremental income, especially in rainfed areas and during the dry season, brought by labor savings that compensated for the higher seed and herbicide cost and yield penalty. Probit regression analysis revealed that area, use of seeds and pesticides, labor use, tenurial status, irrigation, and power cost significantly affected farmer adoption of DSR. Addressing the constraints, especially the yield gap between DSR and TPR, may enhance the adoption of DSR. The study suggests promoting DSR as a viable alternative to TPR in suitable areas through extension services and technology demonstrations; training and encouraging rice farmers to practice efficient weed control techniques including proper water management and land preparation, and to use technologies like drum seeder and similar technologies to save on seeds and labor; and developing rice varieties and technologies ideal for DSR.

Keywords: *Adoption rate, Cost and returns, Direct seeding, Labor cost, Productivity, Agriculture*

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0002

Adoption of Root crop and Fruit–Based Processing Technologies Learned from Training Programs

Esther T. Botangen, Hilda L. Quindara, and Joyce K. Mama-o

The Benguet State University-Northern Philippine Rootcrops Research and Training Center (BSU-NPRCRTC) has disseminated processing technologies to individual household members, farmers, and associations in communities in collaboration with regional line agencies in the Cordillera Administrative Region and Region I. Fourteen trainings were conducted that focused on rootcrop-based snack items, desserts, breads, cookies, and beverages. Flour making from cassava was also introduced. A total of 487 individuals and four associations were trained. Preliminary results showed that the technologies on making ube wine, instant ginger tea, instant turmeric tea, and potato chips were adopted as livelihood enterprises. The technologies on 'ube halaya', sweetpotato juice, 'puto', 'maja', camarind, cassava flour, starch, 'pitchi-pitchi', 'kutchinta', and 'bibingka' were adopted only for household consumption and special occasions. One association improved blot drying process in potato chips production, which increased their production efficiency. Production of ube wine generated the highest returns over cash expenses at 37.82%, followed by instant turmeric and ginger tea at 28.08% and 34.08%, respectively. Lack of market promotion and limited market are the major problems that constrained the adoption of the processing technologies.

Keywords: *BSU-NPRCRTC, Root crop product, Root crops processing, Adoption, Agriculture*

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0003

Agronomic Response, Nutrient Uptake, and Profitability of PSB Rc18 Lowland Rice Under Organic Production Systems

Minerva L. Gaurana and Berta C. Ratilla

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, Agriculture*

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0004

Agronomic Response of Four Philippine Soybean Cultivars to Temporary Flooding at Two Growth Stages

Liezly L. Magdua and Eureka Teresa M. Ocampo

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, Yield components, Agriculture*

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0005

Agronomic, Yield, and Yield-related Traits of Lowland Rice (*Oryza sativa* L.) to the Regeneration Plasticity of Ratoon Crop

Cielo Luz C. Mondejar and Gerald E. Bello

Grain yield is a complex trait that is determined by direct and indirect traits. To improve grain yield, it is important to determine the relationships between these traits. To further explain the source-sink concept, fifteen genotypes were evaluated to explore not only the variation and association of primary and secondary traits of the main crop but also of the ratoon crop. Above-ground parts are cut at harvest leaving only stubbles and roots as sources of assimilates for the growth and development of ratoon crops. Results of this study indicated significant interactions in the grain yield and dry matter production between the main crop and ratoon crop with opposing tendencies of associations. This information is very useful in developing varieties with the breeding objective of increasing the grain yield potential of the ratoon crop. This may include advancing the grain partitioning in ratoon rice since the low grain yield of the ratoon crop was not the result of limited biomass production but rather a poor translocation and partitioning of assimilates into grains. The ratoon crop yield potential of genotypes identified with good ratooning ability in this study ranged from 1.8–2.4 tons/ha. *Halay Palawan*, *Cuevas*, and NSIC Rc216 were identified to have significantly higher ratoon grain yield than the other genotypes evaluated. However, NSIC Rc216, NSIC Rc222, and NSIC Rc480 were the best genotypes if the selection criteria should include shorter crop growth duration. If cultivars with good ratooning ability have similar crop duration and yield potential with the long-maturing varieties, the use of long-maturing varieties may be more practical in taking advantage of the residual water in areas with moisture and climate limitations instead of increasing crop intensity using ratoon strategy.

Keywords: *Grain yield, Lowland rice, Yield and yield components, Rice ratoon, Ratoon crop, Agriculture*

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0006

Algalization Technology Using a Cyanobacterium, *Trichormus variabilis* for Rice Production

Evelyn H. Bandonill, Jay Carl A. Cacerez, Myrna D. Malabayabas, and Milagrosa R. Martinez-Goss

With the growing concern about the economic and environmental effects of continuous use of synthetic fertilizers in rice cultivation, nitrogen-fixing cyanobacteria or blue-green algae (BGA) were explored as an alternative source of fertilizers for increasing rice production. A local strain of *Trichormus variabilis* (Ns71Ph) was selected as a test biofertilizer because of its high growth rate and high nitrogen uptake. Its effectiveness as a biofertilizer was tested under greenhouse conditions for three consecutive experimental trials using a rice variety, PSB Rc 82, in four treatments and three replicates: T1, control (no fertilizer); T2, 100% NPK recommended rate (120-40-40 kg ha^{-1}); T3, 50% BGA (50 kg ha^{-1}) + 50% NPK (60-20-20 kg ha^{-1}); and T4, 100% BGA (100 kg ha^{-1}). Plants with 100% NPK and 50% NPK + 50% BGA had comparable grain yield, number of panicles, plant height, number of tillers, and leaf greenness during the first and third trial. Comparable phosphorus level in aboveground plant parts of all treatments in the second trial and highest potassium level in 50% NPK + 50% BGA were observed in first trial. A significant increase in soil nitrogen was noted during the third trial using 100% BGA while a decrease in

extractable K was observed in 50% NPK+50% BGA in three trials. Cost and return analysis across the three consecutive trials showed that although 100% NPK obtained the highest net profit of PhP39,539.55, a reasonable return of PhP28,513.45 was attained with 50%NPK+50%BGA. This study demonstrated the feasibility of utilizing BGA as a promising biofertilizer and hopes to reduce input cost in rice production. It further recommends the conduct of actual field evaluation and a study of the long term beneficial effect of BGA to the environment.

Keywords: *Algalization, Blue-green algae, Cyanobacteria, Nitrogen-fixing, Rice production, Trichormus variabilis, Agriculture*

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0007

Checklist of the Genus *Nupserha* Chevrolat (Coleoptera: Cerambycidae: Lamiinae: Saperdini) in the Philippines with a Re-description of *Nupserha melanoscelis* Aurivillius, 1922 from Northern Mindanao

Milton Norman D. Medina and Analyn A. Cabras

A checklist of the genus *Nupserha* Chevrolat, 1858 from the Philippines is provided with a re-description of *Nupserha melanoscelis* Aurivillius, 1922 from Northern Mindanao. Notes on the habitat and ecological threats of *N. melanoscelis* are also discussed.

Keywords: *Beetles, Longhorns, Saperdini, Taxonomy, Agriculture*

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0008

Competition between Rice and Weedy Rice under Different Water Regimes

Roel R. Suralta, Benjamin II D.V. Montero, John Marc V. Paner, Teresa Yvonne O. Santiago, Marielle G. Urbano, Maria Corazon J. Cabral, Dindo King T. Donayre, Florenz T. Asinas, Jennifer C. Mojica, Edwin C. Martin, and Jonathan M. Niones

The rainfed lowland (RFL) rice ecosystem is prone to drought stress and high weed infestation, including weedy rice (WR), which often negatively affects the yield. This study examined the competitive ability of rice and WR under mixed culture and drought stress. Two rice genotypes (drought-susceptible IR64 and drought-tolerant INL73) and a WR were grown in root boxes with soil under mono (rice or WR only) or mixed (rice/WR) cultures and subjected to either continuously waterlogged (CWL) or progressive drought (PDR) conditions during the early vegetative stage. Under PDR, SDW in all planting cultures was reduced relative to their CWL counterparts. The WR in mixed culture had higher SDW than its monoculture counterpart, regardless of water treatments. SDW in mixed cultures under PDR was not affected in IR64, reduced in INL73, and increased in WR relative to their monocultures. Under PDR, water use (WU) was higher in INL73/WR than in IR64/WR mixed culture. Between two mixed cultures, WR mixed with INL73 had higher SDW than when mixed with IR64. The differences in stomatal conductance between INL73 and WR under mixed culture were attributed to the greater increase in total lateral root length of the latter than the former genotype under PDR. Overall, the results showed that WR had greater competitive ability than rice under mixed cultures, especially with a drought-tolerant rice variety. This calls for careful planning of cultivar adoption in rainfed systems where WR is a problem.

Keywords: *Competitive ability, Drought, Mixed culture, Rice, Root plasticity, Water uptake, Weedy rice, Agriculture*

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0009

Consistency of the MOET Kit Test Results with other Diagnostic Tools

Ailon Oliver V. Capistrano, Jose Emmanuel G. Hernandez, Juvy Jane E. Auñgon, Job U. Ramos, Rose Ann B. Ruba, Annie E. Espiritu, and Leylani M. Juliano

The consistency of the Minus-One Element Technique (MOET) soil test kit results were evaluated/compared against the Nutrient Omission Plot Technique (NOPT) from 2017 to 2018 and against laboratory analysis for soil NPK levels in 2019. A MOET pot setup for -N, -P, -K and -S were established inside NOPT field setups according to the same targeted nutrients for a homogeneous exposure of the test plants to field environmental conditions. The field experiment was laid-out in split-plot RCBD replicated four times with varietal maturity as main plot and omitted nutrient as sub-plots. In 2019, soil samples from 12 different sites were used for a MOET test and were subjected to laboratory analysis for soil NPK content for comparison. Agronomic parameters from the MOET test setups were also collected to evaluate a potential substitute for the MOET kit's prescribed procedure of using biomass for nutrient deficiency assessment. Even though biomass is the best indicator of growth, measuring it at the farmers' level is often difficult due to lack of weighing devices hence, a need for a substitute parameter. Results of the 30-45 d biomass between MOET and NOPT setups showed strong linear correlations per nutrient and by cropping seasons (i.e. DS or WS) indicating capability of the MOET to substitute NOPT for soil nutrient assessment. Laboratory results on the other hand were not totally consistent with the MOET test kit results particularly for nutrients P and K resulting to only 89% overall consistency. While consistency of using other agronomic parameters from a MOET test for deficiency analysis showed that leaf count can be a potential alternative to biomass of the test plants as the former does not require sensitive weighing devices for measurement.

Keywords: *MOET kit, Rice, Soil nutrient, Agriculture*

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0010

Control of Browning in Fresh-Cut Eggplant (*Solanum melongena* L.) Using Different Anti-Browning Agents

Perlita A. Nuevo, Jennelyn M. Resorez, Matilde V. Maunahan, and Gloria D. Masilungan

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, Agriculture*

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0011

Critical Periods of Controlling *Cyperus rotundus* L. under Flooded Rice Conditions

Dindo King M. Donayre, Jessica Joyce L. Jimenez, and Edwin C. Martin

C. rotundus is known to reduce grain yields of transplanted (TPR) and wet direct-seeded rice (WDSR) under flooded conditions. Information regarding its critical period of control is not yet known. Two identical experiments were performed to determine the critical periods of controlling *C. rotundus* in TPR and WDSR. Following the procedure of two crop-weed competition periods, the weed was grown with TPR and WDSR in a randomized complete block design arrangement with three replications. Under the critical time of weed removal, *C. rotundus* had the lowest shoot biomass when grown with TPR and WDSR from 0–10 DAT/DAS and the highest from 0–100 DAT/ 0–120 DAS. When grown from 0–20 up to 60 DAT/DAS, shoot biomass increased significantly thereafter. TPR grain yield was not affected by the weed from 0–10 up to 20 DAT but reduced thereafter by 10.7–40% from 0–30 up to 100 DAT. WDSR grain yield was also unaffected from 0–10 up to 20 DAS; however, it decreased thereafter by 15–34.1% from 0–30 up to 120 DAS. Under the critical weed-free period, the shoot biomass of the weed was highest from 10–100 DAT/DAS for both TPR and WDSR; it decreased significantly from 20–100/120 and up to 60–100/120 DAT/DAS. TPR grain yield decreased to 6.1% when the weed was present from 10–100 and up to 60–100 DAT; WDSR decreased by 16.9 and 4.1% from 10–120 and 20–120 DAS, respectively. There was no yield reduction in WDSR from 0–10 and up to 60–120 DAS. The classical method and statistical model suggest that the critical period for controlling *C. rotundus* is from 14–29 DAT in TPR and 18–26 DAS in WDSR. Appropriate and effective weed control techniques should be employed during these periods to avoid having more than 5% grain yield reduction.

Keywords: *Critical time of weed removal, Critical weed-free period, Critical period of weed control, CPWC, Purple nutsedge, Agriculture*

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0012

Cultivar-Specific SSR Markers as Revealed Through Fluorescence-Labeling and Capillary Electrophoresis in Sugarcane (*Saccharum* hybrids spp.)

Rosalyn T. Luzaran and Yong-Bao Pan

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, Agriculture*

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0013

Description of a New Subspecies of *Cyriotasiastes rhetenor* (Newman, 1842) (Coleoptera: Cerambycidae: Lamiinae) from Ilocos Norte Province, Philippines with Notes on the Species Ecology, Behavior, Threats, and Conservation

Milton Norman D. Medina, Decier Oliver R. Mapile, Analyn A. Cabras, and Arvids Barsevskis

A new sub-species of *Cyriotasiastes rhetenor* (Newman, 1842) is described with notes on the ecology, behavior, threats, and conservation of the species provided. This is the fourth subspecies of this monotypic genus in the Philippines.

Keywords: *Conservation, Cyriotasiastes rhetenor, Ilocos, Lamiinae, Philippines, Agriculture*

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0014

Development, Initial Evaluation and Association of Storage Root Yield and Anthocyanin in Sweet Potato Genotypes

Nic Oswald M. Borines and Antonio G. Lalusin

Purple sweet potato cultivars contain anthocyanin pigments, a compound which has several anti- ageing effects. Despite its usefulness, breeding of purple sweet potato lags in quantity compared to non-purple-fleshed cultivars. One assumption is that anthocyanin pigment is an obstacle to starch production in storage roots, affecting its yield. Yet, it is desirable to develop a high-yielding (elite) genotype with high storage root anthocyanin concentration. Five sweet potato genotypes: three non-elite purple, one elite non-purple, and one primitive purple accession were intercrossed in a reciprocal manner. A total of 73 new genotypes were generated. The progenies were initially evaluated for storage root yield and anthocyanin content. Preliminary yield trial (WS) revealed 17 progenies with higher/comparable yield to the highest yielding parent. Five progenies have higher/comparable total monomeric

anthocyanin (TMA) than the high-performing purple parent. Among the progenies evaluated, only G23, a cross between P1 (Mariñas) and P3 (SG-10-85-02) satisfied the two criteria and was identified as the best genotype. Correlation analyses suggest a weak linear relationship between storage root anthocyanin content and yield. However, regression analysis revealed a negative association between two traits.

Keywords: *Anthocyanin, Crossing, Evaluation, Genotype, Storage root, Sweet potato, Agriculture*

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0015

Development of A Smartphone Application For Real-Time Nitrogen Topdressing In Rice Using Digital Leaf Image Analysis

Ailon Oliver V. Capistrano, Jose Emmanuel G. Hernandez, Juvy Jane E. Auñgon, and Job U. Ramos

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 chart (LCC), PhilRice LCC App, SPAD, DGCI-SPAD model, Agriculture*

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0016

Effects of Planting Material Source, Age and GA3 on Growth and Yield of Aeroponically Grown Potatoes

Kexiu Wang, Mingxia Tang, Jianjun Hu, Wei He, Wenting Yang, and Peter Vander Zaag

A good quality planting material for a highly productive minituber production in aeroponic systems is important. This study was conducted to determine if the age and source of the planting materials used in the aeroponic beds would influence tuber productivity. Repeated harvesting of unrooted apical cuttings from hydroponic plants would substantially reduce cost of the planting material by more than 50%. Four different planting materials were evaluated in two experiments in each of two seasons: 28 day old in vitro plants; 28 day old in vitro plants place in a hydroponic system for 14 days; unrooted apical cuttings taken from 42 and 56 day old hydroponic plants. These were evaluated using three cultivars (cvs) in an aeroponic system in the spring season and autumn seasons in a semi tropical setting in Sichuan. All four sources of planting material had "juvenile" simple rounded leaves when transplanted to aeroponic beds. Whole hydroponic plants had the head start compared to in vitro plants and out yielded in vitro plants in the spring season for cv Mira and Chuanyu 117. Apical cuttings for cv Favorita and Chuanyu 117 from hydroponically grown mother plants rooted in four to seven days grew vigorously and yielded higher tuber weight compared to the younger whole hydroponically sourced plants during the spring season. Autumn season results had generally lower yields and no statistically significant differences observed between the four types of planting material. There was a positive correlation between mid season stolon number and final tuber number. The most economical and productive planting material are the 1st and 2nd unrooted apical cuttings taken from hydroponically grown mother plants.

Keywords: *Aeroponics, Apical cuttings, Hydroponics, in vitro, Physiological age, Potatoes, Agriculture*

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0017

Effects of the Different Postharvest Processing Methods on the Occurrence of Ochratoxin A and Cupping Quality of Arabica Coffee

Andres A. Basalong, Von Y. Amado, and Hazen Lyn B. Talbino

Postharvest processing methods of Arabica coffee affect the occurrence of fungal contaminants and green bean qualities. The common fungal contaminants on parchment coffee from the wet and honey methods and dried berries from the dry method were *Cladosporium cladosporioides, Fusarium oxysporum, Fusarium xylarioides,* and *Penicillium* spp. *Saccharomyces cerevisiae* was associated only to the wet and honey method, while *Aspergillus niger* was found only on dried berries. The remaining contaminants of green coffee beans were *Cladosporium cladosporioides, Saccharomyces cerevisiae*, and *Penicillium* spp. from wet method; Saccharomyces cerevisiae and *Penicillium* spp. on the honey method; and *Cladosporium cladosporioides, Fusarium oxysporum,* and *Fusarium xylarioides* on the dry method. Ochratoxin A contamination was detected only on the dry berries from the dry method. The wet and honey processed coffee attained the specialty quality standard,a superior overall cup quality than the dry-processed coffee. Moreover, the financial analysis revealed that higher returns could be obtained following the wet or honey process.

Keywords: *Postharvest processing, Microbial contamination, Cup quality, Financial profitability, Agriculture*

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0018

Electrical Conductivity Effects on Physico-chemical Characteristics and Vitamin C Content of the Fruits of *Solanum lycopersicum* var. cerasiforme Hybrids Grown in Hydroponics System

Paul Christian T. Gloria, Primitivo Jose A. Santos, Charles Anthon E. Cadorna, Ronaldo B. Saludes, Arthur R. Baria, Carlos Primo David, and Jessica D. Rey

Solanum lycopersicum var. cerasiforme (tomato) is an economically important commodity in the Philippine fresh vegetable market and is also considered as a model system for fruit development studies. This study was conducted to establish baseline data on the effect of electrical conductivity (EC) on the physical, biochemical, and nutritional quality of the fruits at different developmental stages using two cherry tomato hybrids, namely Sweet Princess (SP) and Cutie Pie (CP), grown in Simple Nutrient Addition Program (SNAP) hydroponics system. A replicated experiment with three EC treatments using NaCl (1.2 dS m^{-1}, 1.5 dS m^{-1} , and 2.0 dS m^{-1}) was established while total soluble solids (TSS), vitamin C content, titratable acidity (TA), yield or weight of the fruits were measured at different fruit development stages namely, green, turner and red. Results showed that EC of nutrient solution affected the total soluble solids, vitamin C content, and titratable acidity of two cherry tomato hybrids, SP and CP. Our study establishes the significant effect of EC 1.5 on TSS, which is increased at turner stage, on TA and Vitamin C at red stage for SP and subsequent decrease in fruit weight and TA, while that of CP hybrid, EC 1.5 significantly decreases TSS, TA and fruit weight, but increases Vitamin C content at turner stage. EC 2.0 has significant increase on TSS, TA and fruit weight of SP hybrid only. These results are initial reports for the Philippine cherry tomato hybrids grown in hydroponics system. Further studies with larger population size to further minimize the variations between replication and to conduct more technical replications in the assays is recommended.

Keywords: *Electrical conductivity (EC), SNAP nutrient solution, Hydroponics, Cherry tomato, Agriculture*

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0019

Evaluation of the Iron-coating Technology for Direct-seeded Rice in the Philippines

Sandro D. Cañete, Wilfredo B. Collado, and Kazumichi Sashi

Field and screenhouse experiments were conducted to evaluate the performance of iron-coated (Fe-coated) seeds in wet direct-seeded rice (DSR). Effects of iron-coating on seed germination and seedling establishment, yield performance, and the fate of added iron in rice and lowland soil were measured. The germination test disclosed that the mean maximum germination rates were almost similar between the coated and uncoated seeds across varieties, whereas the iron-coated seeds took a longer time to achieve the rates. Results confirmed that Fe-coated seeds produced more established seedlings at low seeding rates during the field experiment. Moreover, the effect of Fe-coating on yield was statistically similar to the transplanted rice and other wet direct seeding techniques, such as the use of dry and pre-germinated seeds regardless of the seeding rates and season. This implies that the seeding rate for wet DSR can be reduced using Fe-coated seeds without diminishing the yield. On the other hand, the screenhouse experiment disclosed a better seedling emergence response in the high flow rate with or without iron-coating. Though yields were not influenced by the treatments, the Fe-coated seeds at a static flow rate achieved the highest yield among the treatments using the NSIC Rc222 variety. Furthermore, Fe-coating in rice seeds did not increase the level of Fe in the soil and in the aboveground plant biomass under wet direct seeding practice. Therefore, the use of Fe-coated seeds is highly regarded both in the wet direct seeding and water seeding practices to reduce the seeding rate while sustaining or improving the yields that are normally achieved under the conventional wet direct seeding practice in the country.

Keywords: *Iron-coated seeds, Maximum germination rate, Seedling establishment, Seeding rate, Wet direct-seeded rice, Agriculture*

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0020

Fat Content, Fatty Acid Composition, and Fatty Acid-based Nutritional Indices/Ratios of Egg Yolks from Different Poultry Species and Breeds

Orville L. Bondoc, Ana Rose Ramos, and Aldrin O. Ebron

The nutritional value of egg yolk in terms of fat content and fatty acid (FA) composition is needed to evaluate their possible effect on human cardiovascular health and disease. This study determined the FA-based nutritional indices/ratios of egg yolks from 29 breeds belonging to seven poultry species (chicken, mallard, quail, Muscovy, guinea fowl, turkey, and ostrich) in a government poultry research station at Tiaong, Quezon, Philippines. At least four pooled samples (each consisting of four egg yolks) per breed were randomly collected and immediately frozen at –20 °C until analyzed for fat content and FA composition by gas chromatography. The major FAs in egg yolk with the highest proportions by weight of total FAs were oleic acid C18:1 n-9 (30.6–43.9%), palmitic acid C16:0 (22.2–54.4%), linoleic acid (LA) C18:2 n-6 (0.4–16.6%), and stearic acid C18:0 (4.0–12.1%). Compared to chicken and quail eggs, the mallard egg yolk seems to have more health benefits because of a lower LA to α-linolenic acid C18:3 n-3 (ALA) ratio (15.70: 1), atherogenicity (0.45), and thrombogenicity (0.91) – as well as higher yolk weight (22.7 g), fat content (31.8%), monounsaturated fatty acids (MUFA) to saturated fatty acids (SFA) ratio (1.73: 1), health-promoting index (2.20), and hypocholesterolemic/hypercholesterolemic ratio (2.26). Among mallard breeds, the egg yolks from Tsaiya and Pekin were superior to that from Itik-Pinas breeds. Egg yolk from other poultry species generally had lower FA-basednutritional values. Significant breed differences in fat content, FA composition, and nutritional indices/ratio were also reported for egg yolks from chicken, quail, and turkey.

Keywords: *Fatty acids, Nutritional indices/ratios, Poultry eggs, Agriculture*

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0021

Fertilization Regime on the Vegetative Growth of Lakatan (*Musa acuminata*) Under Rainfed and Irrigated Conditions

Ebraim R. Ramos, Felen A. Divina II, Dara Maria A. Fabro, Lance Irvin F. Elleva, Roselyn F. Paelmo, Edna A. Aguilar, and Glaisa R. Garcia

Water and fertilizer play an important role in the production of banana. Fertilizer provides nutrients while water is essential in the transportation of assimilates and many other functional and regulatory processes needed in the growth and development of the plant. This study was conducted to determine the effects of different fertilization regimes on the vegetative growth of 'Lakatan' banana under rainfed and irrigated conditions. The experiment was laid out in factorial in RCBD with 4 replications. For the irrigated plot, treatments were: IT1 – Irrigation + No fertilizer application, IT2 – Irrigation + 50% recommended fertilizer rate (RR), IT3 – Irrigation + 100% RR. For the rainfed plot, the treatments were: RT1 – rainfed + No fertilizer application, RT2 – rainfed + 50% RR, RT3 – rainfed + 100% RR. Results showed that rainfed plants were significantly stunted compared with irrigated plants despite similar fertilizer applications. Development was also delayed in rainfed plants as irrigated plants were already transitioning to the reproductive stage on 10th month. Meanwhile, regardless of irrigation treatment,

fertilizer application of either 50% RR or 100% RR significantly increased plant growth in terms of pseudostem height, pseudostem girth, and leaf emergence compared with the control set-up. Thus, monthly fertilizer application of only 50% RR would be sufficient to enhance the vegetative growth of Lakatan.

Keywords: *Banana, Fertilizer, Irrigation, Lakatan, Sigmoid growth, Agriculture*

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0022

Fertilization Scheme and Bunch trimming on Enhancing Productivity and Fruit Quality of *Cardaba Banana Musa balbisiana* (BBB)

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

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 and bunch qualities, Hand trimming, Agriculture*

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0023

Gender Roles in Root and Tuber Crops Production in Northern Philippines

Dalen T. Meldoz, Betty T. Gayao, and Grace S. Backian

Literature provides evidence that gender-specific analysis of agricultural production can improve system performance. This study documents and examines the gender division of roles and responsibilities in root and tuber crops production among indigenous peoples in the Northern Philippines using secondary data, focus group discussions with 83 men and 101 women farmers, field visits, and direct observations. The study covered 11 provinces and 13 indigenous communities: *Ibalois, Kankana-eys, Applai-Kankana-eys, Kalanguyas, Isnegs, Biga-Kalingas, Masadiit-Tingguians, Iyattukas, Ivatans, Bagos, Bugkalots, Aetas,* and *Buhid-Mangyans*, as well as the *Kapampangan* and *Ilocano* rootcrop farmers in Central Luzon. Gender roles and gender division of labor are mostly similar among selected ethnolinguistic groups in different landscapes. Womenâ€™s labor participation with men in land preparation is higher in swidden farming, rainfed sloping field, and dry land, which are unfavourable environments. Men dominate activities that require physical strength such as land preparation, spraying chemicals, and hauling of inputs and harvested crops. Women in subsistence and small farms participate more in field activities. Also, in indigenous groups, women are traditionally exposed to physical labor compared

with those in irrigated areas, wherein the farming households are better off. Results also revealed that men dominate crop maintenance in commercial production of rootcrops among *Kapampangans* and *Ilocanos*, but not for Benguet wherein both men and women almost equally execute potato production activities. Findings imply that policy and development workers can capitalize on the active indigenous women labor participation in matters related to root and tuber crops production as a strategy for food security.

Keywords: *Rootcrops, Gender, Production, Indigenous knowledge, Agriculture*

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0024

Genetic Diversity, Components of Variation and Clade Pattern of Philippine Coix (*Coix lacryma-jobi* L.) Germplasm Populations

Sancho G. Bon, Gerlie P. Antesco, Visitacion C. Huelgas, and Elmer C. Enicola

Thirty-seven Philippine germplasm accessions of cultivated and weedy type coix were characterized using morphometric descriptors and assessed for diversity, components of variability and genetic similarity patterns. Diversity indices showed high estimates ranging from H' = 0.5046 to H'= 0.9678, with most of the descriptors having values of at least H' = 0.90 and generally associated with reproductive descriptors. Inherent diversity was confirmed through the principal components analysis where variability was distributed to as many as seven principal components accounting for 79.20%. First three components account for 52.66% of the variation which relate to both vegetative and reproductive descriptors. A 3D plot showed groupings of the accessions along the first three principal components. Cluster analysis further confirmed the inherent variability of the populations as shown by the clade pattern. Cultivated types were generally separated from the weedy types. Subgroupings were also formed among the cultivated accessions with some outliers. Results form as initial information on the diversity of the Philippine coix germplasm. Recommendations for the conservation and enhanced utilization of the local germplasm of coix are suggested.

Keywords: *Philippine Coix (Coix lacryma-jobi L.), Morphometric descriptors, Agriculture*

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0025

Germplasm Collection and Varietal Evaluation of Heirloom Rice Landraces in Benguet, Philippines

Belinda A. Tad-awan, Hector C. Gayomba, Teresita D. Masangcay, Jasmin M. Chomawat, and Wilner S. Mauting

Heirloom rice landraces are unique breeds of rice that are distinct from other rices in many characters. Heirloom rice is a principal crop planted in the rice terraces of Benguet and is now gaining momentum in the local and international market. Benguet province, an ethno society depicts an heirloom rice farming community which has preserved its rice landraces as demonstrated by its large production area. Documentation and germplasm collection was done in three major heirloom rice producing municipalities involving 330 heirloom rice farmers using a semi-structured questionnaire. Participatory evaluation of rice landraces with market potential was done with farmer-cooperators in three sites (Bakun, Kapangan, and Kibungan) where selection was done by other

heirloom farmers during harvest. There were 82 rice landraces documented and collected in Bakun, Kapangan, and Kibungan. In the participatory evaluation and selection, the best landraces in each location based on yield, stability, and farmers' preference are *Brando, Lablabi* and *Lasbakan* in Bakun; *Sapaw, Balatinaw,* and *Bongkitan* in Kapangan, and *Balatinaw* and *Bongkitan* in Kibungan.

Keywords: *Heirloom rice, Germplasm collection, Participatory evaluation, Stability analysis, Agriculture*

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0026

Growing Arabica Coffee in the Mountain: Evolving Production and Marketing Practices in Benguet and Mountain Province

Ruth S. Batani, Beverly C. Sa-ao, Kristerlyne S. Manao, Mary An J. Altaki, Joel C. Faroden, Gretchen Shagami M. Hudson, and Darlyn D. Tagarino

Using focus group discussions and key informant interviews, this paper presents the production and marketing dynamics vis-à -vis local capacity to meet local demands in selected Arabica growing communities in Benguet and Mountain Province. Findings show that there are various efforts done locally to keep the industry thriving amidst challenges such as climate hazards and the attractiveness of converting to vegetable cash crop production. Two distinct potential good practice models figure when looking at the coffee industry's major local players: the individual entrepreneur and the organized cooperatives. These models are not new, but findings show that each model has elements to share and areas where each model can work at its best. These models have upscaling potentials.

Keywords: *Arabica cultivar, Individual entrepreneur, Organized marketing, Specialty coffee, Institution building, Agriculture*

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0027

Harvesting Time Influenced The Grain Quality, Phenolics, and Total Antioxidants of Aromatic and Non-Aromatic Rice

Mary Ann U. Baradi, Clarence T. Dangcil, Jessica M. Solero, Gerome A. Corpuz, and Marissa V. Romero

The study aimed to investigate the influence of harvesting time on brown rice, milled rice, and head rice recovery, amylose content, crude protein, total phenolic content, and total antioxidant activity of aromatic and non-aromatic rice. The experiment was conducted in irrigated lowland ecosystem in San Nicolas, Ilocos Norte and laid out in two-factorial Randomized Complete Block Design (RCBD) with three replications. The harvesting times include 25, 30, and 35 days after flowering (DAF, i.e. 50% of panicles flowered); while the two varieties were aromatic Burdagol- Laguna Type and non-aromatic PSB Rc 82 rice. The time of harvesting and variety and their interactions had significant effects on brown rice and head rice recovery, crude protein content, total phenolic content, and total antioxidant activity as measured by 2,2'-diphenyl-1- picrylhydrazyl (DPPH) radical scavenging activity. Burdagol-Laguna Type had highest brown rice and head rice recovery when harvested at 35 DAF and 30 DAF, respectively. PSB Rc 82 had highest head rice recovery at 25 DAF and highest total phenolic content at 25-30 DAF. Both varieties had highest crude protein content when harvested at 35 DAF and highest total phenolic

content and % DPPH radical scavenging activity when harvested at 25 DAF. Harvesting PSB Rc 82 at 25 DAF was found optimum for all parameters except crude protein. Harvesting Burdagol- Laguna Type at 35 DAF was found suitable for brown rice and milled rice recovery, amylose content, and crude protein content, with moderate head rice recovery, total phenolic content, and % DPPH radical scavenging activity. Burdagol-Laguna Type had higher brown rice recovery harvested at 30−35 DAF and total phenolic content but had lower amylose content and % DPPH radical scavenging activity than PSB Rc 82. Differences in the responses between these aromatic and non-aromatic rice in terms of changes in grain quality and antioxidants with different harvesting times may be attributed mainly to their inherent genetic characteristics. Thus, it is important to determine the optimum harvesting time for aromatic and non-aromatic rice to attain the maximum grain quality and health benefits that are important to rice consumers.

Keywords: *Amylose content, Aromatic rice, Brown rice recovery, Crude protein content, % DPPH radical scavenging activity, Grain quality, Harvesting time, Head rice recovery, Total phenolic content, Agriculture*

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0028

Influence of Seeding Rate and Flooding Period on Growth of Lowland Ecotype *Cyperus rotundus* L. and Yield of Wet Direct-seeded Rice under Dual Culture

Dindo King M. Donayre, Jessica Joyce L. Jimenez, Henesie G. Pascua, and Edwin C. Martin

A higher seeding rate and water management through flooding are proven effective against many weeds of wet direct-seeded rice. However, the efficacies of these techniques against the lowland ecotype *Cyperus rotundus* are not yet known. Two experiments were conducted each twice to determine the influence of seeding rate and flooding period on the growth of lowland ecotype *C. rotundus* and the yield of wet direct-seeded rice under dual culture. The first experiment involved two levels of weed pressure (without and with lowland ecotype *C. rotundus*) and four seeding rates of wet direct-seeded rice (60, 120, 180, and 240 kg ha^{-1}); the second involved three flooding periods (7, 14, and 21 DAS) including the full saturated condition. The shoot biomass of the weed was heaviest at 60 kg ha^{-1}; reduced by 10, 20, and 41% at 120, 180, and 240 kg ha^{-1}. It only weighted 8% when flooding was applied at 7 DAS; 23 and 31% at 14 and 21 DAS, respectively. The grain yield of wet direct-seeded rice was not different at four seeding rates nor various flooding periods. Despite that, the grain yield was higher by 66% when flooding was done at 7 DAS; 39 and 40% at 14 and 21 DAS, respectively. The findings of this study demonstrated that using a higher seeding rate and early flooding had negative influences on the growth of lowland ecotype *C. rotundus* but not on the yield of wet direct-seeded rice.

Keywords: *Cultural weed management, Cyperaceae, Mutha, Plant density, Purple nutsedge, Agriculture*

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0029

Influence of Weed Control Techniques on Weeds, Yield, and Economics of Dry Direct-seeded-Drip-irrigated Rice under Philippine Conditions

Dindo King M. Donayre, May-Ann F. Galapon, Edwin C. Martin, and Kristine Samoy-Pascual

The use of herbicides in combination with hand weeding has been shown to be effective against a variety of weeds in irrigated and rainfed wet direct-seeded rice in the Philippines. In the case of dry direct-seeded-drip-irrigated rice; however, these aspects are not known. A study was conducted to determine the influence of two weed control techniques on weeds, yield, and economics of dry direct-seeded-drip-irrigated rice under Philippine conditions. Four treatments – [T1] unweeded; [T2] application of pre-emergence herbicide using pretilachlor, followed by two times hand weeding; [T3] application of post-emergence herbicide using bispyribac-sodium, followed by two times hand weeding; and [T4] weed-free using the sequential application of pre- and post-emergence herbicides followed by six times hand weeding – were tested and arranged in RCBD with three repetitions. T1 has the highest weed density and biomass with lower grain yield (901.8 kg ha^{-1}) but no net income. T2 and T3 had lower weed biomass than T1 but could not be compared with T4, where no weed density and biomass were recorded at 15, 30, and 45 DAS (days after seeding) in both dry and wet seasons. Grain yields at T2 (3,794.4 kg ha^{-1}) were not significantly different from T3 (4,341.3 kg ha^{-1}) except when compared with T4 (5,7245 kg ha^{-1}). Net income in T2 was higher by PHP 20,575.1 over T1 and T3 by PHP 9,831.4 over T2. T4 had the highest grain yield among all treatments and achieved an advantage of PHP 45,272.1, 24,697.0, and 14,865.7 over T1, T2, and T3, respectively, in terms of net income. Herbicide application followed by hand weeding reduced weed growth and improved rice yield and net income. The combination of pre- and post-emergence herbicides followed by six times hand weeding was much more effective at suppressing weeds and achieving higher grain yield and net income.

Keywords: *Drill-seeding, Drip irrigation, Weed control efficiency, Weed diversity, Agriculture*

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0030

Informal Seed System on Greater Yam (*Dioscorea alata*): Knowledge and Practices among Indigenous People in Northern Philippines

Grace S. Backian, Betty T. Gayao, and Dalen T. Meldoz

Indigenous knowledge on variety, seed selection and seed-related practices is very important in the maintenance of greater yam diversity. However, baseline information on indigenous production, storage, or exchange of traditional greater yam varieties, and planting materials is very limited, especially among the indigenous people of the Northern Philippines. Hence, this documentation using secondary data, key informant interviews, field observation, and photo documentation to validate gathered information. Indigenous farmers' technique on the utilization and management of cut setts that weigh from 200-500g, aerial tubers, and small to big tubers allowed for the multiplication and maintenance of indigenous varieties. At present, the round and elongated varieties with purple-colored-flesh color are utilized in commercial purple yam production. Thus, the need to strengthen research and development on local or traditional varieties conservation and capacity building with emphasis on production, storage, and distribution.

Keywords: *Cut setts, Purple yam, Indigenous varieties, Agriculture*

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0031

Morphological Characterization and Species Verification Using *Cytochrome C Oxidase Subunit I (COI)* of Two Laguna Populations of the Cacao Pachyrhynchine Beetle, *Pachyrhynchus moniliferus* Germar, 1823 (Coleoptera: Curculionidae)

Kimberly Ann S. Domingo, Barbara L. Caoili, and Sheryl A. Yap

Pachyrhynchus moniliferus Germar is one of the major insect pests in cacao plantations in Luzon Island, Philippines. It is morphologically very similar to other *Pachyrhynchus* species and, thus, often mistakenly identified. Consequently, inappropriate control measures are applied. Herein, two *P. moniliferus* populations from Laguna province, one from Los Baños and the other from Magdalena (Philippines), were morphologically examined and DNA barcoded. The Magdalena population has a bigger body size, as well as a longer and wider rostrum compared to the Los Baños population. Comparison between the Folmer fragment of the *COI* gene of the *Pachyrhynchus* from Los Baños and Magdalena to the nucleotide sequences in the GenBank revealed a best match of only 87% identity to *P. speciosus* Waterhouse (KU953498.1) and 88% to *P. orbifer* Waterhouse (KU953440.1), respectively. The COI sequence of *P. moniliferus* presented here is the first DNA barcode reported for this species (GenBank Accession Numbers: MT038197.2–MT038204.2). We recommend conducting more thorough morphometric studies in conjunction with genetic diversity analyses on the different *P. moniliferus* populations across the Philippine islands.

Keywords: *Cacao pest, DNA barcoding, Luzon, Morphology, Nucleotide sequence, Weevil, Philippines, Agriculture*

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0032

Need-Based and Participatory Approach to Extension: Case of Addressing Sweet potato Fusarium Wilt in Kayapa, Nueva Vizcaya

Grace S. Backian, Dalen T. Meldoz, Teresita D. Masangcay, and Cynthia G. Kiswa

This paper describes the process or model applied in addressing the Sweetpotato Fusarium wilt problem in Kayapa, Nueva Vizcaya. The project started with the assessment of the problem through the Participatory Rural Appraisal approach, which led to action planning and implementation of possible interventions or services needed by the farmers. Utilization of clean planting materials, soil amendments, and *Trichoderma*, a biological control agent, were likewise demonstrated in farmer's field to showcase these technologies. The process applied the participatory strategy involving the farmers, technicians, and researchers in all the stages, needs assessment, action planning and implementation, and technology demonstration.

Keywords: *Participatory, Food security, Trichoderma, Agriculture*

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0033

Performance of Orange-fleshed Sweetpotato Varieties in Three Agroecological Conditions in the Cordillera Administrative Region, Philippines

Hilda L. Quindara1, Isidro B. Awal, Roger P. Gayumba, and Belinda A. Tad-awan

Increasing local production and market availability of fresh and processed orange-fleshed sweetpotatoes (OFSP) could be one nutrition-specific intervention to help promote health and well-being. OFSP is an alternative source of carbohydrates, minerals, and vitamin A. This study used a participatory variety selection approach to evaluate the performance of OFSP varieties for off-season production in three selected areas of CAR under low elevation, mid-elevation, and highland farmers' production systems. Findings show that despite some environmental and production limitations, the different OFSP varieties produced considerable yield and exhibited high dry matter content. The dark orange-fleshed 'Taiwan' variety grown at temperatures ranging from 16-25oC with an elevation of 1,316 masl had the lowest yield and dry matter content with moist textural characteristics. NSIC SP 30 produced low yield and dry matter with considerable acceptable eating qualities. Across locations, var. *Inmitlog*, an early maturing variety with intermediate orange-fleshed color, consistently produced the highest yield and dry matter content with well-accepted eating qualities. This variety showed adaptability to off-season planting conditions at varied production elevations, thus, has potential for contributing to nutrition and food security and as an income-generating crop for marginalfarmers.

Keywords: *Mealiness, On-farm evaluation, Elevation, Harvesting methods, ß-carotene, Agriculture*

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0034

Production Performance of Salad Tomato Varieties Under Conventional Cultivation and the SemiTemperate Conditions of Benguet, Philippines

Amelia M. Kimeu

Tomato is an important vegetable and contributes to food security, income, and improved farmers' livelihoods worldwide. Tomatoes contain many health-promoting compounds and a nutritious part of a balanced diet. Over the last decade, consumers have become more aware of foods as a source of health benefits and their roles in preventing several chronic diseases. The study was conducted to evaluate, select and recommend specific varieties of salad-type tomato and to determine the economic benefits of growing salad tomato under a conventional production system at the HORTI Experimental Station of Benguet State University, La Trinidad, Benguet. The experiment consisted of 14 entries of salad tomato and laid out in a randomized complete block design with three replications. Variety 'Apollo' was used as the check variety. 'Athena' variety was the earliest to bear flower at 23 days after transplanting. 'Astig', 'Makapuno', and 'Apollo', the check variety, which were significantly comparable at 28-30 days to flowering. All the entries evaluated produced 5 to 6 flowers per cluster. 'Discovery' variety had the longest and widest fruit. 'Marvel' had the highest total number of marketable fruits at 193.70, while the 'Makapuno' variety significantly had the highest fruit yield with 8.68 kg/5m2 plot. 'Victory' produced the highest total yield with 10.04 kg/plot and 'TM 03' variety recorded the highest sugar content with 12.86 0Brix. Tomato cultivars evaluated were observed to be mild to moderately resistant to late blight infection. 'Victory' can be considered profitable due to high ROI under La Trinidad, Benguet condition as a strategy for food security.

Keywords: *Variety, Varietal evaluation, Selection, Conventional, Production, Agriculture*

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0035

Soil Quality Index for the Two Agricultural Areas along the Naboc River in Davao De Oro, Philippines Contaminated with Mercury

Royette C. Posadas, Alvin Angelo A. Salting, Reylan Dave A. Evangelista, Rodrigo M. Real Jr., Lyrae A. Casidsid, and Eduardo O. Sagarino

The study aimed to determine the soil physicochemical conditions, soil quality index (SQI), its relationship to soil total mercury (THg), and their spatial autocorrelation of the two mercury-contaminated agricultural areas in Monkayo, Davao de Oro, Philippines. Soil physicochemical parameters and THg were assessed, and the data underwent principal component analysis (PCA). The minimum data set (MDS) revealed that percent sand, pH, THg, phosphorus (P), and organic carbon (OC) significantly contributed to the SQI expression. The two agricultural areas (Diwata and Naboc) had comparable ($P > 0.05$) soil quality indices (0.46 ± 0.073 and 0.46 ± 0.11), which were categorized as Grade 3 (moderate SQI). THg was negatively associated with the SQI, with the regression coefficient (R) equal to –0.419 ($p = 0.021$); however, this association did not mean a causal effect. Hence, mercury (Hg) contamination could not be singled out as the sole factor in soil quality deterioration but rather the synergistic effects of the agricultural practices and the Hg contamination. Spatial autocorrelation analysis revealed that THg spatial distribution in both areas and the SQI of Diwata were clustered; however, the spatial distribution of SQI in Naboc was random. An in-depth study of soil microbiological function and the ecotoxicological effect of mercury on soil quality is deemed important to be studied.

Keywords: *Autocorrelation, Mercury, Minimum data set, Naboc River, Principal component analysis, Soil quality index, Small-scale gold mining, Agriculture*

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0036

Species Accounts, Assemblage, and Microhabitats of Amphibians and Reptiles of Northeastern Leyte, Philippines

Syrus Cesar P. Decena, Dionesio R. Macasait Jr., and Michael S. Arguelles

Leyte Island is part of a large biogeographic region of the Philippines called the Mindanao Pleistocene Aggregate Island Complex, which is home to many endemic amphibian and reptile species. Studies on these particular groups of vertebrates on the island remained very scarce, despite the fact that these are being threatened by various anthropogenic activities. In this present study, preliminary accounts, occurrence, and habitat and microhabitat of amphibians and reptiles are provided from the northeastern portion of the island, particularly in the Leyte Cordillera Mountain Range and Babatngon Range. The study yielded a total of 50 species (20 amphibians and 30 reptiles) from various habitats such as montane forest, dipterocarp forest, selectively logged dipterocarp forest, agroecosystem, and pasture. It was found that the study sites have high endemicity, where 65% (n = 15) and 70% (n = 21) of the documented amphibians and reptiles, respectively, are endemic to the island or country. The forest habitats were dominated by forest specialist species – primarily, *Platymantis guentheri, Philautus leitensis, Limnonectes magnus, Occidozyga laevis, Pulchrana grandocula, Staurois natator, Cyrtodactylus annulatus,* and *Pinoyscincus llanosi*. On the other hand, highly degraded habitats (pastures) were dominated by open-habitat specialists (*e.g. Hylarana erythraea, Fejervarya moodiei,* and *Eutropis multifasciata*). In addition, it was also found that many amphibians had an overlapping microhabitat (mainly terrestrial and aquatic), whereas many of the reptile species inhabited arboreal microhabitats. Finally, the study implies that actions must be taken to maintain this high diversity of amphibians and reptiles, as well as their persistence by conserving especially the remaining forested areas of the island.

Keywords: *Babatngon Range, Diversity, Herpetofauna, Leyte Cordillera, Mindanao Pleistocene Aggregate Island Complex (Mindanao PAIC), Agriculture*

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NP

0037

Stability Analysis of BC2 Abaca (*Musa textilis Nee*) Hybrids Across Different Locations in the Philippines

Mark Anthony L. Parducho, Ramarie Ann B. Rama, and Antonio G. Lalusin

Performances of the three abaca genotypes were evaluated in seven locations in the Philippines. Yield stability was determined using both parametric and non-parametric method and GGE biplot. BC2-7 had the best performance with regard to growth-related agronomic characters. CTRL outperformed the hybrids in terms of prolificacy though this could be attributed to sudden shift of growth from vegetative to reproductive stage due to stresses. Moreover, CTRL had the best fiber yield and fiber recovery among the three due to high tensile strength of pure abaca compared to the two hybrids. In addition, extreme values observed in control in some environments affected the overall result for yield-related characters. Eberhart and Russell's stability measures identified BC2-2 as the more stable genotype and revealed that hybrids could perform better than CTRL under less favorable environment. Kang, and Nassar and Huehn's stability measures identified BC2-7 as the most stable genotype. GGE biplots provided potential mega-environments for each genotype and ranking of environment showed the best growing location for abaca. Aside from these, biplots also showed that BC2-7 is the most stable genotype.

Keywords: *Abaca, GGE biplot, Multilocation, Non-parametric, Stability analysis, Agriculture*

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NP

0038

Status of Introduced Potato Varieties in Benguet and Mountain Province, Philippines

Cynthia G. Kiswa, Gabby K. Dao-ines, and Betty T. Gayao

Benguet and Mountain Province are recipients of several potato variety introductions since the 1970s due to its favourable climate to highland crop production. Farmers save planting materials year by year through traditional practices, which led to accumulation of diseases, degeneration, and eventually, loss of varieties. Other reasons for loss of varieties are unavailability of plant materials, susceptibility to diseases, particularly wilts and rots, vulnerability to abiotic stress, and introduction of new varieties. Out of 40 varieties introduced, only 15 varieties are presently cultivated. Only five of these cultivated varieties are most preferred by farmers, namely: Granola, Igorota, Mexican, Fina, and Cosima. However, Fina and Cosima are limited in production due to the unavailability of planting materials. These were among the eight varieties retrieved from growers and now regenerated, conserved and presently being multiplied at Benguet State University - Northern Philippines Root Crops Research and Training Center (BSU-NPRCRTC) germplasm gene bank for verification and re-introduction.

Keywords: *Indigenous, Loss varieties, Variety adoption, Conservation, Agriculture*

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2020,
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NP

0039

Storing Rice Parental Lines Under Mid-Elevation Environment Maintains Seed Germination and Seedling Vigor

Babylyn T. Salazar, Bong M. Salazar, Lowel V. Guittap, and Susan R. Brena

Seed storage in cold room is very effective in maintaining high seed viability and seedling vigor of high-value seeds like those of thermosensitive genic male sterile (TGMS) female parent line, albeit this is an expensive strategy. Hence, the study was conducted from September 2017 to September 2018 to determine if seed storage in mid-elevation environment (24°C, 72-90% RH, and 850 meters above sea level) can be a practical approach to maintain seed and seedling qualities of hybrid parental lines. A 3 x 2 x 2 factorial experiment was laid out in split-split plot design with storage environment (ambient room in low elevation, 21 meters above sea level (ARL), cold room in low elevation (CRL), or AR in mid-elevation (ARM) as main plot, storage container (woven polypropylene bag (PB) or hermetic bag (HB)) as subplot, and hybrid TGMS parental line (M20 female parent (S line) or M20 male parent (P line)) as sub-subplot. Seed testing commenced before storage and every month thereafter until 12 months of storage. Seed germination was assessed using in-between paper method, while seedling vigor was evaluated based on seed germination and seedling length values. Results show that seed viability (> 90%) and seedling vigor (10% reduction) across treatments were only comparable until the first month of storage. Germination percentage of S line seeds packed in PB and stored in ARL significantly declined to 85% at 3 months of storage, and further to 16% at 7 months of storage. Interestingly, seeds in HB in ARM storage registered comparable germination percentage (94-95%), seedling height (20-21 cm), shoot dry weight (26-27 mg), and seedling vigor (34-35% reduction) with seeds in CRL until 12 months of storage.

Keywords: *Mid-elevation storage, Seed germination, Rice seedling vigor, Hermetic storage, Rice parental lines, Agriculture*

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0040

Structural, Morphological, and Physicochemical Properties of Starch in Main and Ratoon Rice in South Korea

Jong-Hee Shin, Sang-Kuk Kim, Chae-Min Han, Jong-Gun Won, Tae-Young Kwon, and Se-Jong Kim

Rice ratooning is the cultural practice used to produce easily a second rice crop in the same year from the stubble left behind after the main-crop harvest. The major advantage of rice ratooning is that a double crop of rice can be grown for additional returns in areas where it is the main crop. Rice quality properties such as the milling and cooking quality are the most important factors that determine its market acceptability. In this study, the milled rice quality and starch characteristics of the main and ratoon rice crop of three early-ripening rice cultivars in South Korea, ‘Jinbuol’, ‘Joun’, and ‘Junamjoseng’, were estimated. Highly significant variations were detected in the milled rice quality between the main and ratoon rice. The protein and amylose contents of ratoon rice were higher than those of the main rice. The Toyo value (gloss) of the cooked rice of the main crop was lower than that of the ratoon crop, which was due to the higher air temperature during the grain filling period of the main compared with that of the ratoon crop. The mean temperature during the grain filling period of the ratoon rice was favorable (21°C–22°C) for the optimal maturation of early-ripening rice cultivars. The normalized chromatograms of the

branch chain length distribution of amylopectin revealed a distinct difference between the main and ratoon rice flour. The starch from the ratoon rice had a higher quantity of short amylopectin chains than those of the starch of the main crop. Scanning electron microscopy examination of the starch showed that the cropping pattern caused differences in the rice starch granule shapes and sizes between the main and ratoon.

Keywords: *Agriculture, Ratoon rice, Rice quality, Starch, Yield*

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0041

Suitability of Sugarcane Extract as a Local Extender and the Use of Either DMSO or Glycerol as Cryoprotectant for the Cryopreservation of the Banaba Native Breed Chicken (*Gallus gallus domesticus*) Semen

Abdul-Rahaman S. Salifu, Jose A.N. Bautista, Antonio A. Rayos, Josefina T. Dizon, and Percival P. Sangel

The experiment was designed to test the suitability of sugarcane extract (SE) as a local extender for the cryopreservation of the Banaba native chicken semen by comparing the effects of different cryoprotective agent concentrations [*i.e.* glycerol and dimethyl sulfoxide (DMSO)] and thawing temperatures on the post-thaw semen quality. Twelve (12) 29-month-old Banaba native roosters served as semen donors. Only samples that passed the preliminary semen quality assessment of > 70% motility and morphology were further processed and analyzed using a computer-assisted semen analyzer (CASA). Pooled ejaculate samples were cryopreserved with SE extender containing 3, 5, 7, or 9% (T3%, T5%, T7%, and T9%) glycerol or DMSO concentration levels. The results showed that the inclusion level of cryoprotectants and thawing temperatures have no significant effect on the percent motile sperm, percent progressive sperm, percent normal morphology, and percent viability. The type of cryoprotectant used in cryopreservation of the semen had a significant effect on all the semen quality parameters. Semen cryopreserved with glycerol had significantly higher values compared to DMSO in all semen quality variables.

Keywords: *Banaba native chicken, Cryopreservation, Dimethyl sulfoxide, Glycerol, Sugarcane extract, Agriculture*

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NP

0042

Utilization of Orange-fleshed Sweetpotatoes to Enhance the ß-Carotene Content of Locally Consumed Food Products

Hilda L. Quindara, Ines C. Gonzales, Esther T. Botangen, and Belinda A. Tad-awan

A food-based approach can be a more sustainable and cost-effective means of addressing vitamin A deficiency. Incorporating orange-fleshed sweetpotatoes (OFSP) in commonly consumed food products could be one strategy to enhance intake for ß-carotene. This study determined the ß-carotene composition, sensory qualities, and acceptability of developed OFSP enriched food products compared to the locally consumed food products. The *Inmitlog* variety which can provide a high yield and contains 4,463ug/100g of ß-carotene, was used to enrich pandesal, hopia, and candies. This commonly consumed pandesal, hopia, tamarind, and coconut-candied products

have nil to trace amounts of ß-carotene. OFSP-enriched pandesal, hopia, and candies, on the other hand, contain considerable amounts of ß-carotene, which can be an additional source of the recommended daily vitamin A intake for consumers. Sensory evaluation showed that wheat flour substitution with OFSP in pandesal had improved the textural moistness relative to the local pandesal. The sensory shelflife of pandesal and hopia is four days. The OFSP- tamarind candy has a shelflife of seven months, while the OFSP -coconut candy has a shelflife of four months. This study had shown that incorporating OFSP in commonly consumed food items can be a possible intervention to increase the ß-carotene intake of consumers.

Keywords: *Orange-fleshed sweetpotato, Sweet-potato enriched food, Product development, B-carotene, Shelflite, Agriculture*

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2020,
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NP

BIOLOGY

0043

Acute Oral Toxicity Test of Philippine "Bignay" [*Antidesma bunius* (Linn.) Spreng cv. 'Common'] in ICR Mice

Maria Amelita Estacio, Liezl Atienza, Roxanne Gapasin, Jonna Rose Maniwang, James Ryan Aranzado, Carmela Jhoy Mercado, Maria Anville Dela Cruz, Nadja Dominique Fernandez, Dianne Jane Sunico, Katherine Ann Israel, Loraine Bainto, and Joan Ilagan

Acute oral toxicity test of "bignay" 'common' [*Antidesma bunius* (Linn.) Spreng cv. 'Common'] fruit extract (BCFE) was conducted in male and female ICR mice following the OECD Guidelines 425 (2008) to evaluate its safety profile. Irrespective of the sex, physiological [body weight (BW) and BW gain; feed and water intake], hematological [total and differential white blood cell (WBC) and red blood cell (RBC) counts], and biochemical [creatinine and blood urea nitrogen (BUN) levels] parameters were generally unaffected except for the observed decrease in BW and increase in BUN in female mice treated with 2000 and 175 mg/kg BCFE, respectively. In addition, only slight alterations in absolute WBC counts were accounted in BCFE-treated female mice given 55, 175, and 2000 mg/kg doses, as well as in treated male mice administrated with 550 mg/kg BCFE, as opposed to their corresponding controls. Corroborating the absence of mortality, no overt signs of treatment-related toxicity were noted upon gross, biometric, and histological assessment of major organs including the gastrointestinal tract, lungs, liver, kidneys, spleen, heart, and brain. Taken together, the cumulated findings of the present study suggest that oral supplementation of BCFE is relatively safe for consumption up to 5000 mg/kg in treated ICR mice.

Keywords: *Biology, Acute oral toxicity, Antidesma bunius, Bignay, Common, Mice*

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0044

Alkalihalobacillus lehensis M136, a Novel Alkaliphilic, Cyclodextrin Glucanotransferase (CGTase)-producing Isolate from Manleluag Hyperalkaline Spring in Pangasinan, Philippines

Eula Francia M. Bosito, Andrew D. Montecillo, Rose Ann G. Franco, Noel G. Sabino, Aryana Lee G. Bertuso, Bernadette C. Mendoza, and Nacita B. Lantican

A cyclodextrin glucanotransferase (CGTase)-producing bacterium was isolated from Manleluag hyperalkaline spring, Pangasinan, the first to be reported from a hyperalkaline environment in the Philippines. The isolate, M136, had the highest CGTase enzyme activity (46.01 U/mL) out of the forty-one similar bacterial isolates and exceeds the CGTase activity of the reference strain, *Paenibacillus* sp. JCM 9143. Using whole genome analysis, M136 was identified as *Alkalihalobacillus lehensis*. The CGTase enzyme produced by *Alkalihalobacillus lehensis* M136 was partially purified with 73.97% recovery and post-purification activity of 49.52 U/mL. The enzyme has an estimated molecular weight of 78.64 kDa and an isoelectric point of 4.72. Enzyme characterization revealed that it was stable at 30–80 °C (optimal activity at 70 °C), pH 4.0–10.0 (optimal activity at pH 6.0), and in the presence of different metal ions and reagents such as zinc, calcium, magnesium, and manganese, ethylenediaminetetraacetic acid, iodoacetic acid, sodium dodecyl sulfate, and phenylmethylsulfonyl fluoride.

Keywords: *Alkalihalobacillus lehensis M136, Alkaliphiles, Cyclodextrin glucanotransferase, Enzyme characterization, Hyperalkaline spring, Partial purification, Biology*

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0045

Aquatic Coleoptera of northern Negros, Philippines

Marc Ryan Sabordo, Carl Michael Buyco, Gwendalyn Henares, Jessica Pacalioga, and Hendrik Freitag

The water beetle fauna of northern Negros Island has not been comprehensively studied. In this study, aquatic Coleoptera of northern Negros have been compiled from various collections. Specimens were sampled through manual sampling and light trap. Twenty-six (26) species were recorded including 21 which are Philippine endemics. Nine genera and three known species are recorded for the first time from Negros.. Notes on distribution, ecology and identification are provided. Possible new species, future potential discoveries as well as current significance in terms of conservation are discussed.

Keywords: *Biodiversity survey, New record, Taxonomy, Visayas, Water beetles, Biology*

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(Filipiniana Analytics)
NP

0046

Assessment of Molecular Diversity and Heterozygosity in Corn (*Zea mays* L.) Inbred Lines Using Simple Sequence Repeat (SSR) Markers

Aira Janella L. Elec, Rovel Emman G. Austria, John Albert P. Lachica, and Eureka Teresa M. Ocampo

In this study, polymerase chain reaction (PCR) was used to genotype 30 corn inbred lines using 32 simple sequence repeat (SSR) markers. The goal was to establish the level and pattern of genetic diversity as well as to define probable heterotic groups of corn inbred lines. The 32 SSR primers detected a total of 238 alleles in a total of 150 individuals analyzed. The mean different number of alleles, effective number of alleles, Shannon's information index, plus observed (H_o) and expected (H_e) heterozygosity were estimated (Na = 1.33, Ne = 1.29, I = 0.21, Ho = 0.28, He = 0.15) – exhibiting the highest values for *phi*079 (Na = 2.00, Ne = 1.96, I = 0.68, Ho = 0.89, He = 0.49) and the lowest for *phi*050 (Na = 1.00, Ne = 1.00, I = 0.00, H_o = 0.00, H_e = 0.00). The mean values of Ho > He indicates that the population has a mating system avoiding inbreeding. The high level of overall observed heterozygosity in corn inbred lines (mean H_o = 0.28 > mean H_e = 0.15) may indicate greater allelic polymorphism present in these populations and the possible mixing of previously isolated materials in the germplasm collection. Polymorphism information content ranged from 0.79 (*umc*1109) to 0.25 (*umc*1143), with an overall average value of 0.37, indicating that the loci were moderately low to highly informative and could thus detect and quantify genetic diversity in the population studied. In our maize gene pool, total genetic differentiation is somewhat high (0.57), with an excess of homozygotes. Seventeen (17) SSR loci had negative fixation indices (F), indicating a significant heterozygosity level. The population genetic diversity indices were also computed based on the 30 populations analyzed. The Na, Ne, Shannon's information index, Ho, and He varied from population S8L17 to S8L27 with mean values of 1.327, 1.293, 0.214, 0.284, and 0.151, respectively. Populations showed negative F values, indicating significantly higher heterozygosity, whereas polymorphic loci had a mean value of 32.71%. The estimated molecular variance among the corn population was 2.29 and 3.06 for the variance within populations with a total of 5.35. The results of AMOVA also revealed that genetic variation within individuals accounts for 57% of overall genetic diversity, whereas among populations variability accounts for 43%. The cluster analysis, population structure analysis, and principal coordinate analysis revealed the presence of two distinct subpopulations. As a result, the findings of this study provide a foundation for identifying heterotic groups and parental selection, providing a source of unique alleles for future maize breeding efforts.

Keywords: *Corn, Inbreds, Genetic diversity, Heterozygosity, SSR markers, Biology*

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(Filipiniana Analytics)
NP

0047

Automated Classification and Identification System for Freshwater Algae Using Convolutional Neural Networks

John O-Neil V. Geronimo, Eldrin DLR. Arguelles, and Katrina Joy M. Abriol-Santos

Taxonomy and classification of freshwater algae is highly dependent on morpho-taxonomic characterization and molecular genetic techniques. However, these methods are considered time-consuming and tedious. This study was conducted to integrate the latest technological innovations of digital image processing and machine learning in developing an automated detection, recognition, and identification of selected algal species from the divisions of Chlorophyta and Cyanobacteria. OpenCV and Tensorflow (convolutional neural networks or CNN) were used in the development of a digital image identification system of common freshwater algal species *(Chlorococcum infusionum, Chlorella vulgaris, Nostoc commune, Leptolyngbya lagerheimii, Desmodesmus abundans, Acutodesmus dimorphus, Oscillatoria proboscidea,* and *Oscillatoria limosa).* Using OpenCV, digital microalgae images were subjected to image enhancement techniques for the removal of noise and other unwanted objects that minimizes image identification errors. TensorFlow classified these pre-processed images using CNN and gives the percentage results for the algal species in which it identifies each image. The developed automated image

identification system correctly identified 75 images from a total of 80 selected freshwater algae images yielding a final test accuracy of 93.75%. This study exhibited for the first time in the Philippines the use of a CNN-based automated image identification system in the recognition and classification of freshwater algae. The developed system is applicable to algal culture collections and taxonomists for fast and easy identification of algal taxa and improved storage of algal images in the database.

Keywords: *Artificial intelligence (AI), Convolutional neural network (CNN), Digital image processing, Freshwater microalgae, OpenCV, Biology*

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NP

0048

Bioaccumulation and Potential Human Health Risks of Heavy Metals in the Muscles of Tank Goby (*Glossogobius giuris*) in Lake Mainit, Philippines

Rhenzlyn Joy M. Agtong, Francis Alizha R. Laudiño, Marlon V. Elvira, Mayuko Fukuyama, and Joycelyn C. Jumawan

Lake Mainit is the deepest lake in the Philippines with significant economic and ecological importance supporting a wide range of the population. The lake is continuously exposed to various anthropogenic activities exacerbating water pollution and affecting environmental quality. In this study, heavy metal concentrations in the muscles of *Glossogobius giuris* from the lake were assessed using quadruple-inductively coupled plasma-mass spectrometry (Q-ICP-MS). The potential health risk through consumption of this fish was measured following these parameters: estimated daily intake (*EDI*), target hazard quotient (*THQ*), hazard index (*HI*), and target cancer risk (*TCR*). Results show that heavy metal concentrations in the muscles of *G. giuris* are in this order: Cd (not detected) < Pb (0.05) < As (0.17) < Ni (0.35) < Cu (0.99) < Cr (1.43) < Zn (50.12). The consumption rate of *G. giuris* was moderate in Dinarawan (average of 164.44 g/person/d) and the lowest in Kalinawan (average of 45.67 g/person/d). Overall results of *EDI* revealed that metals in the muscles of *G. giuris* are beyond the standard reference dose (*RfD*) except for Cd. The health-risk values of *THQ* determined that consumers in all stations are at risk from Cr and As, which appeared to be > 1. Furthermore, HI values from all stations are significantly greater than 1. The *TCR* results presented for Pb are within the acceptable range of carcinogenicity but exceeded for Cr, Ni, and As and may potentially result in carcinogenic risks to local consumers. It is recommended that heavy metal pollution in aquatic fauna, particularly in capturing economically important fisheries, should be regularly monitored to assess the safety of consumption since significant heavy metal bioaccumulation in *G. giuris* was positively detected above the permissible limits**.**

Keywords: *Hazard index, Health risk assessment, Tank goby, Target cancer risk, Target hazard quotient, Biology*

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(Filipiniana Analytics)
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0049

Biological Activity of Indigenous Selected Plant Growth Promoting Rhizobacteria Isolates and their Ability to Improve the Growth Traits of Shallot (*Allium ascalonicum* L.)

Yulmira Yanti, Hasmiandy Hamid, Nurbailis, and Ni Luh Suriani

The bacterial leaf blight is the primary disease and causes a significant loss of shallot yield in West Sumatera, Indonesia. Plant growth-promoting rhizobacteria (PGPR) is essential in suppressing diseases and improving shallots' growth and health. This study aimed to characterize and investigate the ability of PGPR isolates to control shallots bacterial leaf blight disease and improve its growth. Ten (10) isolates of PGPR designated as *Bacillus thuringiensis* strain MRSNRZ3.1, *B. mycoides* strain MRSNUMBE2.2, *B. mycoides* strain MRBPBT2.1, *B. waihenstephanensis* strain MRBTLL3.2, *B. subtilis* strain MRTDUMBE3.2.1, *B. cereus* strain MRDKBTE1.3, *B. cereus* MRPLUMBE1.3, *Achromobacter insolitus* strain MRBPUMBE1.3, *Pseudomonas hibiscicola* strain MRTLDRZ2.2, and *Bacillus* sp. strain MRSPRZ1.1 were collected from the rhizosphere and endosphere of shallots from Agam and Solok Regency. The variables observed were biocontrol characters (HCN production and siderophore) and biofertilizer characters (indole acetic acid production, ammonia, and phosphate dissolution). These isolates showed activity in controlling leaf blight caused by *Xanthomonas axonopodis*. The present study also suggests that PGPR isolates, *viz.* MRSNRZ3.1, MRSNUMBE2.2, MRBPBT2.1, MRBTLL3.2, MRTDUMMBE3.2.1, MRDKBTE1.3, MRPLUMBE1.3, MRBPUMBE1.3, MRTLDRZ2.2, and MRSPRZ1.1 may be used as biofertilizers to enhance the growth and productivity of shallots. This finding suggests that identified PGPR isolates can be used as biological control agents and biofertilizers to enhance the growth and productivity of shallot.

Keywords: *Biology, Ammonia solubilization, HCN, IAA, PGPR, Phosphate solubilization*

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2022 December,
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NP

0050

Biology of *Spodoptera frugiperda* (J.E. Smith) (Lepidoptera: Noctuidae) on Selected Weed Species Associated with Corn in North Cotabato, Philippines

Anthony S. Agravante, Karen B. Alviar, Analiza Henedina A. Ramirez, and Sheryl A. Yap

Spodoptera frugiperda (J.E. Smith) (Lepidoptera: Noctuidae), also known as fall armyworm (FAW), is a destructive and highly polyphagous insect pest of corn. We hypothesize that associated weed species of corn may be an alternate host of FAW. This study investigated how different weed species associated with corn – such as *Rottboellia cochinchinensis* (Lour.) Clayton, *Ageratum conyzoides* L., *Amaranthus spinosus* L., *Celosia argentea* L., *Commelina benghalensis* L., *Corchorus olitorius* L., *Ipomoea triloba* L., *Eleusine indica* (L.) Gaertn., *Portulaca oleracea* L., and *Synedrella nodiflora* (L.) Gaertn. – influenced the biology of FAW, *S. frugiperda*, which were collected from an infested cornfield in North Cotabato, Philippines. The life history traits of 10 weeds were compared. In *R. cochinchinensis, C. benghalensis, I. triloba, P. oleracea*, and *E. indica*, there was a high number of egg masses and the number of eggs laid by the female compared to *A. conyzoides, A. spinosus, C. argentea, C. olitorius*, and *S. nodiflora*. The duration oviposition period, as well as adult male and female longevity, yielded the same results. The percent survival was the highest (97%) for *I. triloba* and the lowest for *A. spinosus* (83.5%) and *S. nodiflora* (82.50%). Furthermore, no survivors were found in *A. conyzoides* or *C. argentea*. According to our findings, six weed species promoted the growth of FAW from egg to adult.

Keywords: *Fall armyworm, Life history, Weed species, Biology*

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2022 October,

(Filipiniana Analytics)
NP

0051

Biomass and Carbon Sequestration of Forest Tree Species in Response to Microbial Biofertilizers

Iris Ashley C. Algabre, Elenita L. Racelis, and Nelly S. Aggangan

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 CO_2 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, Brunch qualities, Hand trimming, Biology*

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2019,
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NP

0052

Biomass and Carbon Stock Assessment of Trees in the Lowland Evergreen Forest of Mt. Iraya, Batanes, Philippines

Roscinto Ian C. Lumbres, Deign Frolley C. Soriano, Nova D. Doyog, Romel A. Raterta, Severino C. Villarta Jr., and Zenaida G. Baoanan

The Batanes Protected Landscape and Seascape is one of the key biodiversity areas (KBAs) in the Philippines due to its unique biophysical characteristics. Most of the studies conducted in the area focused on biodiversity assessment and limited data and resources are available on the potential of this area in carbon (C) sequestration. Thus, this study was conducted to assess the potential of trees in Mt. Iraya for C sequestration. Five circular plots were established from 100–300 masl, and five circular plots were also established from 301–500 masl. To determine the aboveground and belowground biomass of each tree, allometric models were used as cutting of trees and excessive trampling activities are strictly prohibited in the protected area. The C was determined using the suggested value in the Philippines, which is 45% of the biomass. Results showed that the total biomass in elevation class I (100–300 masl) is 1036.74 Mg ha^{-1}, whereas it is 1422.68 Mg ha^{-1} in elevation class II (301–500 masl). Furthermore, the C and CO2 sequestered in elevation class I is 466.53 MgC ha^{-1} and 1712.17 MgCO2e ha^{-1}, respectively, whereas the C sequestered in the elevation class II is 640.21 Mg ha^{-1} and 2349.56 Mg ha^{-1} for CO_2. The biomass density in Mt. Iraya is higher compared to other forest ecosystems in the Philippines. This only shows that the forest in Mt. Iraya must be protected to further enhance its potential as a C sink rather than the source of emission.

Keywords: *Biology, Carbon sequestration, Climate change, Forest conservation, Forest biometry, Greenhouse gas, Protected area*

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0053

Bivalve Gleaning Fishery in Batan Estuary, Aklan, Western Visayas, Philippines

Annabelle G.C. del Norte-Campos, Lorelie Burgos-Nuñeza, and Switzel Lapara

The gleaning fishery of the Batan estuary, Aklan was monitored over a period of 2 years from May 2018–April 2020 in two sites that differ primarily in location, bottom substrate, and water movement: Tinagong Dagat (TD), which is enclosed inshore, with finer silty/muddy substrate with mangroves and seagrasses; and Batan Bay (BB), which is more seaward, with coarser sandy/muddy substrate with mangroves. The catch was comprised solely of eight species of bivalves common for both sites but with strongly different relative frequencies (%). That is, the top three species of Batan Bay (*Anadara compacta, Marcia hiantina*, and *Gafrarium pectinatum*) were the bottom three species of Tinagong Dagat with the same trend and vice versa. Mean monthly catch rates (kg h^{-1} $gleaner^{-1}$) and daily catch (kg day^{-1} $gleaner^{-1}$) were higher in Tinagong Dagat, suggesting that the slower water movement and possibly anoxic conditions in the site did not pose a negative effect on the overall abundance of the species. Likewise, despite the higher number of gleaners in the area, the resulting annual catch (kg yr^{-1}), value (PHP yr^{-1}), and individual income of gleaners were all higher in Tinagong Dagat. The results further support the higher benthic production in soft sediments with higher organic matter in other gleaned areas of Panay Island, such as those previously reported in Banate Bay, Iloilo compared to the hard, coralline substrates of Malalison Island, Antique.

Keywords: *Batan, Bivalve, Catch, Fishery, Gleaning, Biology*

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NP

0054

Butterfly and food plant composition of a residential garden in Bago City, Negros Occidental, Philippines with four new butterfly locality records

Niño R. Mape, Romana P. De Los Reyes, Agnes A. Talavera, Leana L. Cristobal, and Jade Aster T. Badon

Residential gardens are some of the most common human-managed habitats in highly urbanized areas but their roles on the ecology of various taxa such as butterflies are still understudied. A 7-year observation was conducted to determine the species composition of butterflies and food plants in an urban residential garden in Bago City, Negros Island. Using visual encounters and photo-documentation, the butterfly inventory was done from October 2013 to December 2020 while the food plant inventory covered only two years (2018–2020). The results revealed a total of 88 butterfly species belonging to five families and 60 genera, of which 20 species were classified as residents, 26 seasonal, and 42 vagrants. Despite the very low endemism (8%), it is noteworthy that four species are new island records: *Parnara bada, Potanthus pava, Suastus gremius,* and *Tagiades trebellius martinus*. For the food plants, 80 species from 33 families and 73 genera were identified, of which 37 species are recognized as larval host plants, 49 as nectar plants, and six as both larval host and nectar plant sources. Interestingly, a residential garden with such a small size could harbor 27% of Negros island's and almost 10% of the country's butterfly species. Species richness for both butterflies and food plants are high, which supports the idea that

gardens could be an alternative habitat for wildlife in highly urbanized areas. Future studies should consider measuring the diversity for both taxa as well as environmental factors affecting butterfly and plant communities in a residential garden.

Keywords: *Inventory, Lepidoptera, New island record, Species composition, Urban biodiversity, Urban ecology , Biology*

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0055

Characterization of *Alexandrium tamutum* (Dinophyceae) isolated from Philippine waters, with the rare detection of paralytic shellfish toxin

Garry Benico and Rhodora Azanza

Alexandrium tamutum M. Montressor, A.Beran & U.John is a non-toxic, bloom-forming dinoflagellate species commonly reported in temperate waters. In this study, 8 cultures of *A. tamutum* established from Bolinao Channel and Manila Bay, Philippines were characterized in terms of their morphology, phylogeny and toxicity. Cells were roundish, measuring 25.5 –29.84 µm long and 26.2–28.45 µm wide. The nucleus is equatorially elongated and located at the center of the cell. The chloroplasts are numerous, golden brown in color and radially arranged. Thecal tabulation is typical of *Alexandrium*: APC, 4', 6", 6c, 6s, 5'", 2"". Shape of the taxonomically informative thecal plates such as sixth precingular plate (6") and posterior sulcal plate (sp) was similar to *A. tamutum*, which confirms the species identity. However, the presence of anterior and posterior attachment pores observed in our cultured isolates is the first case in this species. Molecular phylogeny inferred from LSU rDNA and ITS supports our identification by forming a well-supported clade composed of *A. tamutum* strains from other geographic regions. HPLC analysis showed that *A. tamutum* is generally non-toxic except for strain ATC9 which has low amount of decarbamoylsaxitoxin (dcSTX), resulting to a toxicity of 0.07 fmole STX eq per cell. The present study reports the first verified occurrence of Philippine A. tamutum with reliable morphological and molecular information, including the first record in Manila Bay and first detection of PST in one strain at a certain culture period.

Keywords: *Dinoflagellate, Harmful algae, Morphology, Phylogeny, Toxinology, Biology*

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0056

Characterization of Ectomycorrhizal Fungi in Association with *Eucalyptus pellita* F. Muell Seedlings

Nelly S. Aggangan and Heung-Kyu Moon

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, Biology*

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0057

Checklist of Reported Macrofungi in the Philippines

James Kennard S. Jacob, Excelsis S. Romorosa, Eldrin DLR. Arguelles, and Jaycee Augusto G. Paguirigan

The Philippines is known for its ecological diversity due to its climatic condition and geographical location. However, despite having a wide range of organisms, the macrofungal species in the country remain poorly documented. Recent mycological research in the tropics states that more species have yet to be discovered in the Philippines. Despite this, a mycological study still focuses on the ethnomycological survey and species listing. In this study, a survey of publications in macrofungi from 1906 to the present revealed that the Philippines have currently 376 validated species names of macrofungi classified under 66 families and 130 genera. Macrofungal species reported in the country belong to class Ascomycota and Basidiomycota with high species diversity under family Agaricaceae, Lycoperdaceae, Marasmiaceae, and Polyporaceae. Most studies were published internationally and were concentrated in Luzon Island, Philippines. Looking into these, we suggest a biodiversity analysis of macrofungi in other regions of the country. A shift into applying molecular systematics and biotechnology would further develop Philippine macrofungal research, given that the historical trend has focused on morphological identification and classification. We hope that this paper will be a call to further fill the gaps in what is known about the macrofungi in the Philippines, given the country's potential for further discoveries.

Keywords: *Ascomycetes, Basidiomycetes, Macrofungi, Philippines, Biology*

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0058

Chemical Composition and Bioactive Properties of *Sargassum aquifolium* (Turner) C. Agardh and Its Potential for Pharmaceutical Application

Eldrin DLR. Arguelles and Arsenia B. Sapin

Seaweeds are known sources of marine bioactive substances with diverse biological activities important in the synthesis of medically important novel drugs. The proximate and elemental compositions as well as bioactive

properties of a brown macroalga, *Sargassum aquifolium* (Turner) C. Agardh, were studied. Results showed that proximate composition of *S. aquifolium* contain high carbohydrate (32.29 ± 0.17%) and ash (30.19 ± 0.14%) content. Elemental composition of the seaweed exhibited a decreasing order of Na > Ca > K > Mg > Mn > Fe > Zn > Cu > Pb > Cr > Cd. The seaweed had a total phenolic content (TPC) of 5.74 ± 0.04 mg GAE/g. Antioxidant activities of *S. aquifolium* were characterized by having potent ABTS+ [2,2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid)] scavenging activity and high copper reduction capacity with IC_{50} value of 107 µg/mL and 21.01 µg/mL respectively. Evaluation of tyrosinase and elastase inhibition activities showed that *S. aquifolium* extract has potent inhibition activities with IC_{50} of 39.00 µg/mL and IC_{50} of 231.00 µg/mL, respectively – more effective than kojic acid and tocopherol. In addition, *in vitro* assessment of α-glucosidase and α-amylase inhibition property showed that *S. aquifolium* extract has potent inhibitory activity as compared to acarbose (standard anti-diabetic drug) with IC_{50} of 15.60 and 59.0 µg/mL, respectively. Also, the *S. aquifolium* extract exhibited effective antimicrobial activities against bacterial pathogens such as penicillin acylase-producing *Bacillus cereus* (MIC = 125 µg/mL), *Staphylococcus saprophyticus* (MIC = 250 µg/mL), methicillin-resistant *Staphylococcus aureus* (MRSA) (MIC = 250 µg/mL), *Staphylococcus epidermidis* (MIC = 250 µg/mL), and *Pseudomonas aeruginosa* (MIC = 500 µg/mL). The current investigation is a pioneering study in the Philippines that shows the potential of *S. aquifolium* as novel source of bioactive compounds with important use for pharmaceutical applications.

Keywords: *Biological activity, Chemical composition, Marine, Phenolic compounds, Philippines, Seaweeds, Biology*

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0059

Clearing the Fog: A Systematic Review on Cognitive Dysfunction in COVID-19

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[Objective] The systematic review aims to examine the association between COVID-19 and cognitive dysfunction, including the link between the severity of COVID-19 and the occurrence of cognitive impairment and the potential pathophysiological mechanisms related to brain fog among COVID-19 patients. **[Methods**] PubMed, Oxford University Press, ProQuest Health and Medical Complete, ScienceDirect, Ovid, HERDIN, Google Scholar, and Cochrane Library databases were accessed to retrieve literature using the PRISMA guidelines. **[Results]** After critical appraisal, 13 full journal articles were included in the study. The studies showed the most frequent cognitive impairment are attention, memory, and executive function in COVID-19 patients. Compared with healthy controls in three out of four studies, cognitive impairment was only evident in COVID-19 patients. Furthermore, two studies showed no correlation between brain fog and depression, and five studies showed a link between the severity of COVID-19 infection and cognitive impairment. Cases ranging from mild to severe illness presented manifestations of brain fog. However, a disparity in the evidence of the pathophysiology of COVID-19 and cognitive dysfunction exists, prompting the need to investigate further. Additionally, recent studies provide insufficient evidence for direct central nervous system invasion, and there are emerging studies that contrast the presumed pathogenesis of neurological complications from neuroinflammation. **[Conclusion]** There is an association between COVID-19 and cognitive dysfunction. Manifestation of cognitive dysfunction is present regardless of illness severity. Moreover, there are existing pathophysiological mechanisms of the Coronavirus that lead to cognitive dysfunction in COVID-19 patients; however, additional studies are required to substantiate such mechanisms further. **[PROSPERO registration number]** CRD42022325669.

Keywords: *Brain fog, Cognitive dysfunction, COVID-19, Neuroinflammatory processes, Pathophysiology, SARS-CoV-2 infection, Biology*

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0060

Cookeina tricholoma of West Java (Indonesia) Based on Morphological and Molecular Identification

Rudy Hermawan, Ivan Permana Putra, and Mega Putri Amelya

The incomplete information on most reported macrofungi is one of the remaining challenges of taxonomic work in Indonesia. *Cookeina tricholoma* (Ascomycetes, Pezizales, Sarcoscyphaceae), otherwise known as cup fungi, is no exception. In this study, we report *C. tricholoma* from West Java, Indonesia. Fresh materials were evaluated using morphological and molecular analyses. The specimen was illustrated with macro- and microscopic features. Molecular analyses were performed using the internal transcribed spacer region. Cookeina voucher BO24423 was identified as *C. tricholoma*. The morphological characteristics of *C. tricholoma* BO24423 are cup-shaped, pinkish to reddish, and with prominent hairs. The phylogenetic tree analyses confirmed that our specimens were *C. tricholoma* with 99–100% bootstrap value. This study is the first contribution to the identification of *C. tricholoma* based on morphological and molecular evidence for Indonesia.

Keywords: *Ascomycota, Cup fungi, Phylogeny, Taxonomy, Biology*

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0061

Cyrtandra villosissima var. *flavovirens* (Gesneriaceae), a new variety from Zamboanga Del Norte, Philippines

Jay Edneil C. Olivar, Kean Roe F. Mazo, Frank Hauenschild, and Alexandra N. Muellner-Riehl

A new variety of *Cyrtandra villosissima* from Zamboanga del Norte, Philippines, *C. villosissima* var. *flavovirens*, is here described. Both *C. villosissima* var. *villosissima* and *C. villosissima* var. *flavovirens* are erect suffrutescent plants, with large leaves that are slightly falcate, and have inflorescences with linear, densely hirsute bracts. *Cyrtandra villosissima* var. *flavovirens* can be distinguished from *C. villosissima* var. *villosissima* by its pale yellow to yellow-green corollas and its pedunculate inflorescences. A key to morphologically similar taxa, distribution maps, and photographs of the varieties are here provided.

Keywords: *Biodiversity, Systematics Taxonomy, Variety, Biology*

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0062

Density, Orientation, and Distribution of Foliar Trichomes in Selected Philippine Traditional Rice Varieties with Resistance to *Scirpophaga* spp.

Jerick A. Viz and Imeldalyn G. Pacada

Pest infestation restricts rice productivity and, among rice pests, the stem borers (*Scirpophaga* spp.) caused substantial damage of > 20% yield loss. Host resistance is considered the most effective, economical, and environmentally friendly way for rice pest management, and Philippine traditional rice varieties (TRVs) are potential sources of genes useful in breeding for pest resistance. Leaf trichomes are the first physical barrier against any invading plant pests and to characterize the quantitative variations of foliar trichomes of six selected TRVs identified to have resistance – namely, Dinorado, Hinumay, Inarciaga, RED 18, C-4 Dinorado, and Mukol – these TRVs were evaluated using digital light microscopy. RED 18 consistently had the highest trichome density (5.374–9.390/mm^2) in each and across the 2018 wet season (WS), 2019 WS, and 2020 dry season (DS) – even significantly higher (P > 0.05) than the resistant check TKM6 (4.489–5.783/mm^2). For trichome orientation, Mukol (59.151–71.617°), and Inarciaga (57.395–72.464°) consistently had higher and/or statistically comparable angle values to the resistant TKM6 (59.654–71.617°), across each and 2018 WS, 2019 WS, and 2020 DS (P > 0.05). Within- and between-genotype variability showed that adaxial foliar trichomes have varying density and were not uniformly distributed across the leaf surface: densest (4.560–5.456/mm^2) and mostly distributed (49.086–50.532%) in the apical zone of the leaf surface, and least dense (2.623–2.834/mm$^{2)}$ and rarely distributed (16.439–18.806%) in the basal zone. Based on desirable trichome traits and statistical similarities to TKM6, hierarchical cluster analysis delineated RED 18, Inarciaga, and Mukol as excellent sources of trichome traits that will improve plant structural defense against stem borers.

Keywords: *Stemborer, TRVs, Trichome density, Trichome distribution, Trichome orientation, Biology*

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0063

Detection of Fungus Causing Scab Disease of Citrus in Punjab, Pakistan

Neelma Munir, Sundas Moazzam, Rukhama Haq, and Shagufta Naz

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, Biology*

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NP

0064

Distribution and Ecology of *Metapocyrtus* (*Metapocyrtus*) *ged* Cabras & Medina, 2021 in Mindanao, Philippines

Romeo R. Patano Jr., Alma B. Mohagan, Amy G. Ponce, Maria Melanie M. Guiang, Rodceal Malinao, Gretl Rae P. Pescuela, and Fulgent P. Coritico

Metapocyrtus (*Metapocyrtus*) *ged* Cabras & Medina, 2021 is a Mindanao-endemic species known only in Davao del Sur. Here, we recorded the species first in Bukidnon and the Cotabato region. Moreover, we also provide ecological notes of the species specifically the identities of its food plants, description of its habitat, and potential threats.

Keywords: *Food plants, Montane forest, Mount Natampod, Mount Apo, Threats, Biology*

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0065

New Distribution and Rare Records of Microalgae from Aquatic Microcosms of *Guzmania lingulata* (L.) Mez (Bromeliaceae)

Eldrin DLR. Arguelles

The aquatic microcosm of bromeliads provides a unique ecological niche that supports the occurrence of a rare and diverse collection of microalgal species. Taxonomic keys, photomicrographs, and morphological descriptions were used to identify each of the microalgal species. A total of 18 microalgal species were identified from aquatic microcosms of *Guzmania lingulata* in the gardens of florist wholesalers in Laguna, Philippines. Of these taxa, four species were identified both for Chlorophyceae and Bacillariophyceae, three species for Zygnematophyceae, two species each for Euglenophyceae, Trebouxiophyceae, and Cyanophyceae, and one species for Ulvophyceae. The survey reports an additional nine species (*Lepocinclis marssonii*, *Lepocinclis fusiformis*, *Encyonema minutum, Volvox aureus, Lacunastrum gracillimum, Crucigeniella crucifera, Acutodesmus dimorphus, Cosmarium garrolense,* and *Cladophora* sp.) as new records of phytotelm microalgae in the global inventory list and 11 new taxa as additional records of microalgae in aquatic microcosms found in Asia. Also, the existence of three rare microalgae, *Lepocinclis marssonii* Lemmermann, *Crucigeniella crucifera* (Wolle) Komárek, and *Cosmarium garrolense* J. Roy & Bisset are taxonomically described as new records in the Philippines. The floristic survey provided new distributional and taxonomic records of microalgae found in aquatic microcosms of *Guzmania lingulata* in the Philippines.

Keywords: *Algae, Bromeliad tanks, Bromeliads, Cyanobacteria, Microhabitat, Phytotelmata, Biology*

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0066

Distribution and Species Richness of Adult Odonata in Urban Wetlands in Tagum City, Mindanao, Philippines

Karyn Chrislene A. Vitor, Ella O. Pagarigan, Marian Dara T. Tagoon, Melanie M. Garcia, and Majella G. Bautista

Several studies on Philippine Odonata have focused mainly on the protected landscapes and forest reserves; however, little ecological research has been done in an urban setting. Species distribution, abundance, and diversity of Odonata in Tagum were conducted, where no previous records were available. Field sampling was conducted from July–October 2018 among various locations in Tagum City, Davao del Norte. Results showed a total of 1,239 individuals of identified Odonata composing nine species of Family Libellulidae and three species of Family Coenagrionidae. The dominant and most abundant species were *Pantala flavescens, Diplacodes trivialis*, and *Orthetrum sabina.* A relatively high Margalef's Index of species richness (R = 2.148) and moderate species diversity (H'= 1.935) were recorded in Botanical Park and a less even distribution was observed in all sites. Canonical correspondence analysis indicated that both temperature and humidity can affect the abundance of certain species within the community.

Keywords: *Anisoptera, Biodiversity, Coenagrionidae, Odonata, Tagum City, Biology*

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(Filipiniana Analytics)
NP

0067

Diversity and Agro-Morphological Characteristics of Nigerian Sesam (*Sesamum Indicum* L.) Cultivars using Random Amplified Polymorphic DNA Markers

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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, Biology*

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NP

0068

Diversity of Bird Species in Urban Green Spaces of Davao City, Mindanao, Philippines

John Paul M. Banzon, Benito Anthony Pingoy, Virgilio de la Rosa, Maria Catherine B. Otero, Treaseur B. Susulan, Marian Dara T. Tagoon, Elsa May Delima-Baron, and Jayson C. Ibanez

The value of urban green spaces as important habitats for the maintenance of diverse wildlife species is not well explored in the Philippines. Data on bird diversity in urban areas like Davao City is very scant. Thus, the study documented bird species diversity in 15 urban green spaces of Davao City. These areas were previously not surveyed based on published literature. This study is also the first attempt to determine the correlation between green space size and Shannon diversity values. Green spaces were pre-selected, and bird censuses following a zigzag walk across each green space were conducted from October–December 2019. Coordinates of surveyed areas plotted on a digital map were used to estimate green space size. Diversity values were calculated using Shannon and Simpson indices. Pearson r correlation was employed to calculate the correlation between green space size and Shannon diversity values. Fifty-three (53) species (32 families) were accounted for, with 28 species added to the current list of birds from Davao City's urban green spaces. Endemism was relatively low across all sites (17%). Only four species were common in all sites – namely, *Passer montanus, Lanius cristatus, Cinnyris jugularis*, and *Pycnonotus goiavier*. Shannon diversity values varied across sites (highest H' = 3.128, lowest H' = 1.688) and showed a positive correlation (r = 0.54) with green space size. Despite positive correlation, larger green spaces do not necessarily have the highest Shannon diversity values, suggesting that bird diversity in urban green spaces may be influenced by other factors. This warrants verification in the future to include studies on green space vegetation and complexity, noise level, and impact of anthropogenic activities.

Keywords: *Biodiversity, Bird species, Ecological sustenance, Green spaces, Urban planning, Biology*

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NP

0069

DNA barcoding of Philippine freshwater eels of families Anguillidae and Synbranchidae

Ariana Gabrielle B. Melgar, Robert S. Guino-o II, and Persie Mark Q. Sienes

The study used morphological and genetic approach for the DNA barcoding analysis of the inter- and intra-species relationships among catadromous Philippine freshwater eels. Past DNA barcoding studies on Philippine anguillid eels came from Northern Luzon. This study aimed to determine the DNA barcodes of the freshwater eels of the Philippines using the cytochrome c oxidase 1 (CO1) gene of the mitochondrial DNA. Specimens were collected from six sites in the Philippines. Four Anguilla species - *Anguilla bicolor pacifica* Schmidt, 1928, *A. celebesensis* Kaup, 1856, *A. interioris* Whitney, 1938 and *A. marmorata* Quoy & Gaimard, 1824 and one *Monopterus* species– *Monopterus javanensis* Lacepéde, 1800 were collected and identified. Morphological features varied from the taxonomic guides for Anguilla *celebesensis* and *A. interioris* with their body color and fin length. Genetic divergence estimates using Kimura 2- parameter substitution model showed an intraspecific variation of 0–0.4% and interspecific variation of 4.1– 27.6%. The ML tree generated was similar to the previous studies and indicated the monophyly of the Indo–Pacific freshwater anguillid eel lineage. This study also reports the first genetic record of *M. javanensis* sampled from Batac, Ilocos Norte, Philippines.

Keywords: *Anguilla, Catadromous, Ichthyology, Monopterus, Systematics, Biology*

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NP

0070

Early Studies of Marine Microalgae in the Philippines

Milagrosa R. Martinez-Goss

The early documented marine microalgae from the Philippines were done between 1853–1925. A total of 801 taxa were identified and distributed into three phyla, i.e. the Cyanobacteria, the Rhodophyta, and the Bacillariophyta. About 99% of these taxa belong to the Bacillariophyta. Of the 797 total diatom taxa identified by early scientists, there are only 281 species that are accepted as current valid names based on AlgaeBase and DiatomBase. These accepted diatom taxa belong to 63 genera. The three genera with the greatest number of species in decreasing order are *Amphora* (46), *Biddulphia* (29), and *Campylodiscus* (16). Out of the 797 diatom species, 190 species have the Philippines as the type locality and these specimens are deposited in the United States (US) – specifically, at the Farlow Herbarium and in the US National Museum in Washington, DC and in London, England at the Diatom section of the British Museum of Natural History. All these algal materials were part of the collection of four different naval scientific exploring expeditions that visited the Philippines in 1842–1910 – namely, the US Exploring (Wilkes) Expedition (1842), the HMS Challenger (1874–1875), the Italian Cruiser Vettor Pisani (1884), and the USS Albatross (1907–1910). The greatest number of microalgae collected was 743 by USS Albatross, followed in decreasing order by HMS Challenger (57), US Exploring Expedition (17), and Vettor Pisani (1). These early collections of marine microalgae provided invaluable contributions in laying the groundwork for the development of Philippine phycology.

Keywords: *Diatoms, HMS Challenger, Marine microalgae, Naval scientific expedition, USS Albatross, Biology*

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NP

0071

Earthworm diversity and populations in different habitats of Rajah Sikatuna Protected Landscape, Bohol, Philippines

Reizl P. Jose, Nonillon M. Aspe, Wilbert A. Aureo, Rochelyn Y. Parba, Carlo D. Capunhag, and Charina I. Narido

Earthworm survey was conducted to determine the species composition, diversity and species richness in the grassland, agricultural areas and secondary forest habitats of Rajah Sikatuna Protected Landscape (RSPL). Six indigenous morphospecies of earthworms were identified, which are putatively new species. These include one *Amynthas* species, three *Polypheretima* species and two *Pheretima* species. Also, *Pontoscolex corethrurus*, an invasive species was found to be the most abundant species of earthworm in grassland and agricultural areas but not in the secondary forest. Diversity index showed a high level in the secondary forest with low species richness. Agricultural and grassland areas showed a low level of diversity. Land use and abiotic factors can be related to the composition of earthworm communities in different habitats. Further studies must be conducted for the conservation and sustainable management of its biodiversity and habitat.

Keywords: *Earthworms, Diversity, Bohol, Amynthas, Polypheretima, Pontoscolex corethrurus, Biology*

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NP

0072

Effect of Debranching Pullulanase for Resistant Starch Levels and Prebiotic Properties of High Carbohydrate Foods: Meta-Analysis Study

Setiarto, R. Haryo Bimo , Andrianto, Dimas , Isra, Mu

Debranching is one of the enzymatic modifications of starch widely used in analyzing the increased levels of resistant starch (RS) in foodstuffs. However, this modification has a varying effect on each type of high-carbohydrate food. This study aims to analyze the effect of the debranching pullulanase modification in increasing the levels of RS and prebiotic properties of high-carbohydrate foods. This study used 28 articles that were analyzed and selected through the PRISMA guide method from 10.302 selected libraries. Secondary data will be analyzed based on the percentage of Effect Size Hedges'd (standardized mean difference/ SMD) and confidence interval (CI) values using OpenMEE software. The results showed that the pullulanase debranching enzyme method significantly increased levels of RS and prebiotic properties (SMD 2.395; CI 95% $p < 0.001$). In conclusion, this study confirmed that the pullulanase debranching enzyme method had a significant effect with a 95% CI in increasing the levels of RS and prebiotic properties of high-carbohydrate foods. **(Author's abstract)**

Keywords: *Debranching pullulanase, High-carbohydrate food, Meta-analysis, Prebiotic properties, Resistant starch, Biology*

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0073

Effect of Mycorrhizal Inoculation on Growth, Nutrient Status, and Rhizosphere Microbes of *Acacia mangium* and *Eucalyptus urophylla*

Victoria, Kristel S., Aggangan, Nell

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. **(Author's abstract)**

Keywords: *Biofertilizer, Microbial population, Mined-out area, Nitrogen-fixing bacteria, Root infection, Biology*

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2019,
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NP

0074

Effect of Processing on the Antinutrient and Protein Contents of Cassava Leaves from Selected Varieties

Arcillas, Lizette Sahar N. , Garcia, Jayson F. , Estrellana, Cyrene D. , Capuno, Rosa Buena A. , Tambalo, Fides Marci

Cassava leaves, which are usually disregarded in the cassava industry, contain high levels of protein and nutrients. However, their use is limited by toxic cyanogens and antinutritional tannins. In the Philippines, cassava farmers have limited knowledge of the nutritional quality of the leaves. Thus, this study aimed to evaluate various processing techniques to address the safety of cassava leaves intended for human and animal consumption. The three local varieties studied were Binulak, Lakan 1, and Sultan 6. Preliminary analysis of leaves based on position determined that any leaf group could be processed since the hydrogen cyanide (HCN), tannic acid, and protein contents were not significantly different. Whole cassava leaves were subjected to processing, which resulted in lowering of total HCN (in % mean reduction): oven-drying (55.99%) > juicing (50.79%) > boiling (32.01%) > pounding (25.15%). Similarly, tannic acid was reduced by oven-drying (76.32%), juicing (69.94%), and boiling (3.89%) except by pounding. However, the amount of protein content was reduced by oven-drying (24.45%), boiling (21.13%), juicing (17.17%), and pounding (7.58%). A combination of leaf shredding and oven-drying resulted in a reduction of HCN to safe levels except for Sultan 6. Tannic acid was also reduced significantly while the change in protein content is not statistically significant. The results of the study can pave the way for the safe utilization of cassava leaves as an alternative protein and nutrient source for humans and animals. **(Author's abstract)**

Keywords: *Alternative protein, Antinutrients, Cassava leaves, Cyanide, Manihot esculenta Crantz, Tannins, Biology*

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2023 April,
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NP

0075

Effectiveness of Multiple Inoculation of Biofertilizer with Biochar on Growth of Cacao (*Theobroma cacao* L.) Seedlings Planted under Agroforest Ecosystem

Victoria, Kristel S. , Aggangan, Ne

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. **(Author's abstract)**

Keywords: *Agricultural ecosystem, Cacao, Nitrogen-fixing bacteria, Biology*

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NP

0076

Effects of Arbuscular Mycorrhizal Fungi on Rice (*Oryza sativa* L.) Grain Yield: a Meta-analysis Using Different Sources of Variation

Abacan, Elfred John C. , Paguntalan, Diana P. , Java, Ched Jus

The increase in annual rice (*Oryza sativa* L.) grain yield is attributed to chemical and inorganic fertilizer utilization. However, these types of fertilizers reduce grain quality in the long term. Arbuscular mycorrhizal fungi (AMF) can act as biofertilizers and improve crop performance. The present study conducted a meta-analysis on the effects of AMF on rice grain yield using the studies conducted in selected countries in Asia. Ten (10) studies were selected, and 59 experimental results were used. The overall result showed that AMF positively affects the rice grain yield. The AMF experiments on the field and greenhouse showed positive effects, as well as across different environmental conditions, including aerobic and nutrient addition. The multiple-species type of AMF biofertilizer and the single-species type under different genera – namely, *Acaulospora* and *Glomus* – also showed a positive effect. The effect of AMF on different rice varieties is also positive, especially on varieties grown in lowland agroecosystems. The findings in this study show that various types of AMF increase the rice grain yield of different rice varieties under various environmental conditions. This supports the application of AMF in rice farming. **(Author's abstract)**

Keywords: *Arbuscular mycorrhizal fungi, Rice, Grain yield, Meta-analysis, Biology*

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NP

0077

Evolvulus nummularius (L.) L. (Convolvulaceae), a New Exotic Plant Record for the Philippines

Silvosa-Millado, Cyrose Suzie , Delima, Aileen Grace D. , Raganas, Aaron Froi

Evolvulus nummularius (L.) L. of the Convolvulaceae family has a pantropical distribution, but its occurrence is reported first time in the Philippines. The discovery of this alien species began during the photo documentation of the plant specimens in the botanical garden at the College of Science and Mathematics, University of the Philippines Mindanao campus. It was found growing on clayey soil and thought to be naturally growing in the botanical garden. However, we found out that it was intentionally planted as a cover crop to avoid soil erosion and to reduce mud formation on the pathway to the garden during rainy days. The species is believed to be introduced in the country by traders or enthusiasts as an ornamental or medicinal plant. Though its cultivation is contained within the botanical garden, the species is considered invasive in many countries. Therefore, its cultivation needs to be regulated, and proper management must be put in place in the botanical garden in order to prevent its possible colonization in surrounding areas and across the country. **(Author's abstract)**

Keywords: *Alien plant species, Evolvulus, Invasive plant, Mindanao, New record, Biology*

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2022 December,
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NP

0078

Fern Species Diversity along Selected Roadside Vegetation of Macalelon and Infanta, Quezon Province, Philippines

de Villa, Kristiane R. , Perida, John Benedick O., PeÃ±averde, Hazel Ann A. , Barrera, Jr., Wilfredo

Limited information is known about fern diversity and ecology in roadside vegetation because fern studies are mostly conducted in montane ecosystems. This study aimed to report the diversity and distribution of fern species in the roadside vegetation of Quezon Province, Philippines. We established sampling plots along selected roadside vegetation of Macalelon and Infanta and surveyed the fern communities. The ecological factors were measured in situ while the edaphic factors were analyzed ex situ for physicochemical parameters. We identified a total of 15 species belonging to seven families and 12 genera. Both study sites have low fern diversity and evenness. The most common species in Macalelon was *Nephrolepis hirsutula* (G.Forst.) C.Presl., whereas *Sphaerostephanos hirsutus* (Kunze ex Mett.) Holttum was in Infanta. Two species, *Lygodium circinnatum* (Burm.fil.) Sw. and *Pteris vittata* L. were classified as least concern (LC), and one species, *Phymatosorus scolopendria* (Burm.f.) Pic.Serm. was classified as vulnerable (VU). Canonical correspondence analysis revealed that fern distribution in Macalelon was highly influenced by relative humidity, elevation, soil temperature, and air temperature, whereas it was by soil pH, slope, soil organic matter, soil moisture content, and elevation in Infanta. The fern species thriving in the roadside vegetation of the localities are adaptive to disturbance and changes in ecological and edaphic factors, which highlights their importance as potential bioindicators. **(Author's abstract)**

Keywords: *Anthropogenic activities, Conservation status, Edaphic and ecological factors, Pteridophytes, Road widening, Species richness, Biology*

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(Filipiniana Analytics)
NP

0079

Fiber Morphology and Extractive Content of *Aquilaria cumingiana* (Decne.) Ridl. Wood from Davao Oriental, Philippines

Maldia, Lerma S.J. , Abasolo, Willie P. , Mendoza, Rosalie C. , Villareal, Jay

The fiber morphology and extractive content of *Aquilaria cumingiana* (Decne.) Ridl. wood collected in Davao Oriental, Philippines were determined to gather pioneering information about the properties of *A. cumingiana* for better characterization and classification. Wood samples were classified according to color with the aid of a Nix Mini 1 Color Sensor and labeled as A, B, C, and D. The result of the study showed an increasing trend of color lightness percentage from samples A (32.74%) to D (74.96%). Morphologically, both samples C and D (1.03 mm) showed the longest fiber, sample A showed the largest fiber (35.41 μm) and lumen diameter (27.77 μm), and sample C showed the thickest cell wall (4.71 μm). On the other hand, the highest Runkel ratio, slenderness ratio, and flexibility ratio were shown in samples B (0.49), C (33.00), and A (78.13), respectively. The amount of extractives obtained in the study decreases from samples A to D regardless of the solvents used. Statistically, the color lightness, morphological properties, and extractive content were significant across sample classifications. Among solvents used, the extractive content showed a significant result. The color lightness and extractive content showed a negative relationship, which signifies that the color lightness may be used to evaluate the amount and quality of extractives in *A. cumingiana* wood. Based on the morphological properties, *A. cumingiana* fibers are

found favorable in pulp and paper production. The classification and characterization of *A. cumingiana* wood properties along the infected portions of a tree and chemical profiling of the extracts would be relevant information to consider. **(Author's abstract)**

Keywords: *Agarwood, Aquilaria cumingiana, Color lightness, Derived values, Extractive content, Fiber morphology, Solvents, Biology*

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NP

0080

Genetic Basis of Pathogen Establishment and Fungicide Resistance of Phylogenetically Related *Pseudocercospora* spp. through Comparative Genomics

Dacones, Leilani S. , Rey, Jessica D. , Balaga, Katrina

Cavendish banana is one of the most consumed fruits across countries with demands expected to grow by 2026. The Philippines is one of the top producers of Cavendish bananas, yet is negatively impacted by the Sigatoka disease complex (SDC) caused by three *Pseudocercospora* spp. – namely, *P. musae, P. fijiensis*, and *P. eumusae*. These pathogens are persistent in the field despite various control programs implemented in plantations. Whole genomes of fungi have aided in understanding the interactions of co-occurring pathogens and the emergence of fungicide-resistant populations. This study sought to characterize the underlying basis of *Pseudocercospora* spp. co-infection by determining possible processes involved during disease establishment and factors associated with fungicide resistance development through an *in silico* approach. Homology search on disease establishment-related proteins revealed that *Pseudocercospora* spp. share more similar than unique proteins, suggesting an independent disease establishment process. Meanwhile, the ratio analyses of non-synonymous and synonymous mutations (Ka/Ks) in fungicide resistance-related genes suggest that mutations in *sdhB* genes exhibit adaptive potential. Furthermore, proteins that are associated with the development of fungicide resistance in other fungal species have been detected among Pseudocercospora spp. Lastly, phylogenetic studies using ribosomal RNA gene cluster showed that *Pseudocercospora* spp. have shown indications that two *Pseudocercospora* spp. have diverged from one of these species. The findings of the study elucidate the contributory factors for the co-infection of *Pseudocercospora* spp. in bananas. Results in the disease establishment study can also be used in developing more effective strategies for SDC control in bananas and provide insights into the epidemiological trajectories of pathogens over time. **(Author's abstract)**

Keywords: *Disease complex, Establishment, Fungicide resistance, Phylogeny, Sigatoka, Biology*

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NP

0081

Genetic Diversity and Population Connectivity of the Greenblotch Parrotfish (*Scarus quoyi* Valenciennes, 1840) within Southern Mindanao Inferred from Mitochondrial 16S rRNA

Elumba, Merlene E. , Cabasan, Joey P. , Fortaleza, Maybelle A. , Labrador, Kevin L., NaÃ±ola, Jr., Clet

A genetic assessment was done on the greenblotch parrotfish (Scarus quoyi Valenciennes, 1840) in three bays within southern Mindanao, Philippines. Mitochondrial 16S rRNA recovered 12 haplotypes, one of which was dominant in all sites. Despite the reported phenotypic variation from previous assessments, there was neither evidence of genetic structure (global Φ_{st} = 0.012, p = 0.13) nor isolation by distance (r = 0.05, p = 0.50). Genetic diversity was also low (H_{global} = 0.472; π_{global} = 0.13%), with ~ 77% of haplotype diversity accounted for with just 69 samples. While connectivity suggests continuous larval exchange within southern Mindanao owing to the species' high dispersal potential, low genetic diversity implies reduced effective population size, probably due to recent bottlenecks (*e.g.* overfishing, habitat destruction). Although this study provides baseline genetic information on the local population, inferences are considerably limited by the genetic marker used and the spatial scale under investigation. A thorough understanding of the population will be possible if the entire habitat range of the species is assessed using markers with high resolving power, such as the hypervariable mitochondrial control region, microsatellites, or genome-wide single nucleotide polymorphisms (SNPs). **(Author's abstract)**

Keywords: *16S, Genetic assessment, Population structure, Scarus quoyi, Biology*

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2022 December,
(Filipiniana Analytics)
NP

0082

Genetic Diversity of Philippine Native Pigs (*Sus scrofa* L.) from Quezon and Marinduque Based on Morphological and Microsatellite Markers

Basilio, Jr., Elpidio B. , de la ViÃ±a, Celia B. , Manuel, Ma. Carmina C. , Vega, Renato S.A. , Aquino-Ang, Genevieve Mae B. , Cruz, Rick Julius D. , Logronio, Dan Joseph C., Ju, Yu Ten , Laude, Rita

Nine microsatellite markers recommended by the Food and Agriculture Organization were used to measure the genetic diversity of Quezon and Marinduque native pig populations – with a total of 37 and 40 individuals, respectively. All markers were discovered to be polymorphic, with a mean number of alleles per locus of 10. Marinduque native pigs were found to have a mean effective number of alleles (EA), mean observed heterozygosity (HO), mean expected heterozygosity (HE), and mean polymorphic information content (PIC) of 5.005 ± 0.547, 0.673 ± 0.040, 0.780 ± 0.024, and 0.76 ± 0.03, respectively. By contrast, Quezon native pigs had mean EA, mean HO, mean HE, and mean PIC values of 5.280 ± 0.787, 0.634 ± 0.044, 0.773 ± 0.035, and 0.75 ± 0.04, respectively. Between the two populations, the heterozygosity (HE > HO) and positive values of FIS (0.1714) and FIT (0.1868) indicated a low number of heterozygotes, suggesting the possibility of inbreeding. The test of Hardy-Weinberg equilibrium (HWE) showed that three loci each in the Quezon and Marinduque native pig populations deviated from HWE. Although morphological analysis revealed significant differences in snout shape, head profile, ear type, and all morphometric traits, a low level of genetic differentiation between the two populations was observed (FST = 0.0186; Nei genetic distance = 0.130; Nei unbiased genetic distance = 0.082). Overall, these findings imply that further studies on the genetic improvement and conservation of Philippine native pigs are required for the development of signature pig breeds across the country. **(Author's abstract)**

Keywords: *Genetic diversity, Microsatellite markers, Morphology, Philippine native pig, Biology*

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(Filipiniana Analytics)
NP

0083

Growth Enhancement of Rice (*Oryza sativa* L.) by Zinc-Solubilizing Bacteria Isolated from Vesicular-Arbuscular Mycorrhizal Root Inoculant (VAMRI)

Pedro, Mannix S. , Gargarino, Allysa Mae P. , Brown, Cristine B. , Nepomuceno, Robert A., Brown, Marily

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. **(Author's abstract)**

Keywords: *Zinc solubilizing bacteria, Soil zinc deficiency, Biofertilizer, Biology*

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2020 April,
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NP

0084

Growth, Nutrient Uptake, and Soil Chemical Properties Text Cacao Seedlings Using Biochar or AMF Grown in Acidic Soil

Jomao-as, Joshua G., Aggangan, Nell

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. **(Author's abstract)**

Keywords: *Arbuscular mycorrhizal, Black carbon, Infertile soil, N and P uptake, Root infection, Biology*

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2019,
(Filipiniana Analytics)
NP

0085

Hawkmoths of Baguio City, Philippines: a Preliminary Checklist Derived from Photo-based Observation Records Available on iNaturalist and Philippine Lepidoptera Internet Platforms

Kitching, Ian J. , Mape, NiÃ±o R., Alisto, Li

Hawkmoths are among the most popular insects but have received little attention in the Philippines over the last two decades. This study took advantage of the photographic records of hawkmoths available on two online social network platforms: iNaturalist and Philippine Lepidoptera. From these data sources, we created a preliminary species checklist and defined the species composition of hawkmoths in Baguio City, Philippines. We recorded a total of 275 observations made between January 2014–August 2021, from which 35 species and subspecies were identified. Nine (25.71%) of these are Philippine endemics. The community composition of hawkmoths in the city was composed generally of common species, observed mostly during the wet season. This study demonstrates the potential of publicly available photo-supported observations of hawkmoths as a valuable source to obtain data in support of basic lepidopterological studies and, hence, improve the dearth of information regarding Philippine hawkmoths. **(Author's abstract)**

Keywords: *Baguio City, Hawkmoths, iNaturalist, Philippine Lepidoptera, Species inventory, Urban biodiversity, Biology*

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NP

0086

Hypocholesterolemic Activity of Mungbean 8Sα Globulin Engineered with Lactostatin

Recuenco, Mariam C. , Manuel, Ma. Carmina C. , Uy, Lawrence Yves C. , Medina, Mart Almer P., Torio, Mary An

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 (8sα globulin) was made possible. In this study, the 8sα 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 8sα globulin protein for comparison purposes and this preliminary approach checked that the mutation plotted to the mungbean 8sα 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 8sα globulins were 746.36 ± 5.71 µg mL-1 and 1066.02 ± 3.76 µg mL-1, respectively. Based on the densitometric analysis, the expression of the mutant 8sα globulin is slightly higher than the wild type 8sα globulin. Hydrophobic Interaction Chromatography (HIC) was used to purify the WT and mutant 8Sα 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 8sα globulin. The percent (%) reduction of bound sodium taurocholate of HIC purified WT and HIC purified mutant 8sα globulin were 31.62 ± 0.56 – 33.49 ± 1.62; and 27.54 ± 1.82 – 40.29 ± 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 8sα globulin (40.29 ± 6.29), indicating the presence of the hypocholesterolemic activity of the released target peptide. **(Author's abstract)**

Keywords: *Hypocholesterolemic, Lactostatin, Protein engineering, Site-directed mutagenesis, 8S#945 globulin, Biology*

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0087

In Silico Potentials of *Alpinia galanga* Constituents against Human Placental Aromatase Vital in Postmenopausal Estrogen-dependent Breast Cancer Pathogenesis

Macabeo, Allan Patrick G. , Quimque, Mark Tristan J. , Cruz, III, Cecil Laurence M. , Manzano, Joe Anth

Breast cancer is the leading cause of cancer-related deaths among women. With the clinical success of several synthetic aromatase inhibitors (AIs) as therapeutic agents in post-menopausal estrogen receptor-positive breast cancer, natural products have been tapped in search of chemically diverse compounds with potential better effectiveness against aromatase while conferring reduced adverse effects. *Alpinia galanga* is among the Philippine native medicinal plants with extensive studies on its phytopharmacological properties, yet reports on its human placental aromatase inhibitory activity remain rudimentary. To determine the aromatase inhibitory activity of *A. galanga in silico*, a total of 119 database-derived *A. galanga* secondary metabolites were evaluated molecularly docked onto the catalytic site of human placental aromatase using the UCSF Chimera platforms according to the AutoDock Vina BFGS algorithm. To assess binding stability, molecular dynamics (MD) simulations using the GROMACS software package were carried out. Drug-likeness was assessed *in silico* using SwissADME. Of the screened compounds, galanolactone (1), 4-(3,4-dimethoxy-*trans*-cinnamoyl)-*trans*-cinnamic acid (2), isocoronarin D (3), quercetin (4), β-sitosterol (5), (*E*)-8ß,17-epoxylabd-12-ene-15,16-dial (6), galangin (7), labda-8(17),12-diene-15,16-dial (8), 7-(4-Hydroxy-3-methoxyphenyl)-1-phenylhept-4-en-3-one (9), and 3,5,7-trihydroxy-4-methoxyflavanone (10) conferred highest binding affinities against aromatase ranging from binding energies of –8.7 to –8.0 kcal/mol with notable formed hydrogen bonds and interactions against key amino acid residues. Top-ranked compounds were predicted to have good druggability, whereas MD simulations demonstrated the stability of the ligands inside the complex. Overall, the study indicates the potential of top *A. galanga* secondary metabolites as promising drug pharmacophores in developing therapeutics against breast cancer. **(Author's abstract)**

Keywords: *Alpinia galanga, Aromatase inhibitors, Breast cancer, Molecular docking, Molecular dynamics, Biology*

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0088

In Vitro, Molecular Docking, and Meta-analysis Studies of Screening Antidiabetic Bioactive Compounds from Roselle (*Hibiscus sabdariffa* Linn.)

Fitradiansyah, La Ode , DS, Haslinda , Sinulingga, Fahri , Rahmadani, Kharmila , Handoko, , Ahmad, , Vanggy, Leggina Rezzy , Meilina, Lita , Mustopa, Apon Zaenal , Manguntungi, Baso , Erdiandini, Ira, Masniawati, Andi , Hastuti, Heru Pi

Diabetes mellitus is a chronic metabolic disorder due to insulin function insufficiency. This study aimed to test the effectiveness of flower extract of roselle (*Hibiscus sabdariffa* L.) extract in producing antidiabetic compounds. The inhibition of roselle flower extract on the alpha-glucosidase enzyme was carried out *in vitro*. Molecular docking was also carried out to bind ligands derived from roselle flower extract's secondary metabolites to the alpha-glucosidase and alpha-amylase enzymes. Based on molecular docking, models have negative binding energies suggesting those ligands make a complex to the site receptor. Kaemferol-3-O-rutinoside and tiliroside

become the most stable complex based on the lowest energy score of –9.5 and –8.1 kcal/mol for alpha-amylase and alpha-glucosidase, respectively. The highest antidiabetic activity was obtained at a 100 ppm roselle flower ethanol extract and distilled water with an inhibition value of 100.00 and 99.25%, respectively. The alpha-amylase inhibiting test, using a concentration of 2.5 mg/mL, had an inhibitory activity of 41.77%. The *in vitro* assessment was conducted using the meta-analysis. The meta-analysis study showed that roselle flower extract could reduce glucose levels in fasting rats better than negative controls (diabetic rats) by 61% than those not given the roselle flower extract. **(Author's abstract)**

Keywords: *Antidiabetic, In vitro, Meta-analysis, Molecular docking, Roselle, Biology*

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0089

Influence of Bamboo Biochar, Arbuscular Mycorrhizal Fungi, and Nitrogen-fixing Bacteria as Soil Amendments on Cacao (*Theobroma cacao* L.) Planted in Acidic Soil

Aggangan, Nelly S. , Sabino, Noel S. , Mendoza, Bernadette C. , Jomao-as, Jos

This study determined the influence of varying soil amendments containing bamboo biochar (BB) with or without biofertilizers on the populations of arbuscular mycorrhizal fungi (AMF) and nitrogen-fixing bacteria (NFB), on plant growth, and soil parameters in acidic soil under nursery conditions. Cacao var. UF18 were sown in polypropylene bags filled with a 200-g oven-sterilized soil-sand mixture. After a month, cacao seedlings were transferred to a mixture of unsterilized acidic soil (4.65 pH) and vermicompost (3:1, w/w) and amended with BB (w/w) at varying concentrations (0, 15, and 30%). Inoculation with available formulated AMF inoculants (AMF1 and AMF2) and NFB, singly and in combination, was also done during this stage by adding the recommended rates directly beneath the roots. The results showed that regardless of biochar concentration and the type of AMF inoculum used, there was a significant decrease in AMF spore count and root colonization when AMF and NFB were combined. Root colonization in cacao by AMF1 or AMF2 showed no significant difference from each other. In general, the amendment of BB could have resulted in better soil properties such as increased pH, nitrogen (N), and phosphorus (P), which provided a condition where microorganisms can optimally grow. However, co-inoculation of AMF and NFB resulted in a decrease in both spore count and root colonization, suggesting possible adverse interaction between the microorganisms. Co-amendment of 15% BB and biofertilizer (NFB or AMF1 alone) resulted in heavier (140 and 130 g plant^{-1}) plant biomass compared with single inoculation of BB or biofertilizer (50–90 g plant^{-1}). Moreover, the highest N uptake (2257 mg plant^{-1}) was observed in cacao plants inoculated with NFB grown in 15% BB-amended soil. Cacao seedlings inoculated with NFB and AMF1 and amended with 15% BB soil resulted in the highest uptake of P (537 and 539 mg plant^{-1}, respectively). The results clearly showed the beneficial effects of combining biofertilizer and BB at 15% concentration as compared to 0 and 30%. It is recommended that the same treatments be done in a field study to verify the results obtained in the nursery experiments. **(Author's abstract)**

Keywords: *Acidic soil, N uptake, Philippines, P uptake, Soil amelioration, Spore count, Biology*

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0090

Influence of Microbial Inoculation on Heavy Metals Absorption of Three Reforestation Species

Aggangan, Nelly S. , Morong, Lea

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. **(Author's abstract)**

Keywords: *Bioconcentration factor, Phytoremediation, Translocation factor, Biology*

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0091

New locality records of Jewel Blue butterflies (Lepidoptera:Lycaenidae) in the Philippines

Badon, Jade Aster T. , Dela Cruz, Ian , Burlace, Cristy , Leviston, David , Talavera, Agnes A. , Rabor, Jr., Arnold , Salaga, Har

Nature interest groups such as the Philippine Lepidoptera Butterflies and Moths, Inc. (PhiLep) aim to monitor and document butterflies and moths in various landscapes across the country using citizen science. This report compiled new island records for the four species of the genus *Chilades* known in the Philippines, namely Chilades putli gnoma with new records from General Santos City (Mindanao) and Bohol Island, *Chilades lajus athena* from Zamboanguita, Negros Oriental and Banton Island, Romblon (Visayas) and the Batanes Islands, *Chilades mindora* from Bohol Island, and *Chilades pandava vapanda* with new records from Barobo, Surigao del Sur (Mindanao), and Bago, Negros Occidental. **(Author's abstract)**

Keywords: *Biodiversity, Citizen science, Chilades, New record, PhiLep , Biology*

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0092

Low-cost Media from Agro-industrial Wastes for the Cultivation and Metabolite Production of Lactic Acid Bacteria

Almazan, Rober Angelo R. , Brion, Myka Shem S. , Perez, Rodney H. , Saguibo, Jenni

Lactic acid bacteria (LAB) are the most well-documented, "generally regarded as safe" microorganisms used in food fermentation, cosmetics, and pharmaceuticals. Many probiotic strains are utilized for the production of beneficial metabolites, such as bacteriocins and lactic acid, which influence the preservation, organoleptic characteristics, and nutritional properties of food. However, these strains are usually cultured using complex and expensive media, which significantly contribute to the cost of the final product. Thus, this study aims to develop a low-cost alternative medium (LCAM) for the growth and metabolite production of industrially important LAB strains. After several preliminary experiments, an LCAM containing rice bran extract, waste coconut (mature) water, baker's yeast extract, table sugar, and salts was subjected to a statistically-guided optimization study for growth support of a model LAB strain *Lactobacillus plantarum* BS. Based on the second-order response mathematical model, the optimized medium composition was 35% rice bran extract and 58% waste coconut water, 1% baker's yeast extract, 1% table sugar, and 5% salt solution (LCAM A) plus a modified version without baker's yeast and table sugar (LCAM B). Predicted values were acceptable at 95% (8.91 and 8.88 log CFU/mL) and highly comparable (102% relativity) with the commercial complex medium used as control. Both LCAM formulations were found to support the growth and metabolite production of different LAB genera (*L. plantarum* BS, *Lactococcus lactis* NCDO 497, *Enterococcus faecalis* M4-3, *Streptococcus thermophilus* BIOTECH 1555, and *Pediococcus acidilactici* BIOTECH 1068). The LCAM supported the metabolite production of these LAB strains comparable with the commercial medium but is 7.4–7.6-fold cheaper than the cheapest commercial medium. This significant cost reduction has a huge prospect on the large-scale utilization of LAB. Nevertheless, further studies are necessary to enhance the nutritive composition of LCAM for other genera of LAB. **(Author's abstract)**

Keywords: *Agro-industrial wastes, Bacteriocin, Lactic acid, Lactic acid bacteria, Lactobacillus plantarum, Low-cost alternative medium, Biology*

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0093

Macro Land Snail Diversity and Community Assemblage in Selected Forest Fragments of Leyte Island, Philippines

Tingson, Keshia N. , de Chavez, Emmanuel Ryan C. , Fontanilla, Ian Kendrich C. , Pogado, Fretzelj

The diversity of land snails in Leyte Island has not been examined over the past few years. To address this, a survey of macro land snails (> 5 mm in shell height and diameter) in selected forest fragments of Leyte was conducted. A total of 120 quadrats (10 x 10 m) were set in three sampling sites (Inopacan, Baybay, and Maasin) that varies in area size – with Baybay being the largest fragment, followed by Inopacan and Maasin. From a total of 592 individuals, 22 macro land snail species and five families were identified. The macro land snail assemblage was dominated by endemic eupulmonates (Order Stylommatophora) and caenogastropods (Order Architaenioglossa). Among eupulmonates, Family Camaenidae had the most species (10), followed by Trochomorphidae and Achatinidae (two each), and Helicarionidae (one). For caenogastropods, all seven species were under Family Cyclophoridae. *Cyclophorus appenidiculatus* was the most abundant, representing 16.65% of the total number of individuals. *Lissachatina fulica*, an invasive land snail, was also documented in all sites. A *β*-dominated community assemblage was revealed by species accumulation curves with sampling efficiency using a completeness ratio of 1, which indicates a highly efficient sampling method. Detrended correspondence analysis indicated high similarity in species composition among study sites, with two unique species (*Subulona cylindracea* and *Hypselostyla boholensis*) recorded in Maasin and two incidental records (*Obba bigonia* and *Helicobulinus sarcinosa*). This study yielded 15 new records of macro land snail species during the sampling. There were five species (*Hemiglypta semiglobosa, Amphidromus maculiferus, Leptopoma perlucidum, Chloritis leytensis,* and *Obba bigonia*) that were documented on earlier records on the island, but 33 of the previously

recorded macro land snail species were not encountered in the study. The community ecology patterns were also documented in the fragmented forests of Leyte, which is very important in local malacofaunal conservation and management. **(Author's abstract)**

Keywords: *Forest fragments, Land snails, Leyte Island, Visayas, Biology*

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0094

Manzaea minuta gen. & comb. nov. (Scytosiphonaceae, Phaeophyceae) from the tropical Northwestern Pacific Ocean

SantiaÃ±ez, Wilfred John E., Kogame, Kazuh

Recent molecular-assisted taxonomic studies on the brown algal genus *Hydroclathrus* has resulted in discoveries of new taxa in the family Scytosiphonaceae, both at the genus and species level. However, phylogenetic studies on *Hydroclathrus* based on wide geographical sampling also suggested that the genus is not monophyletic. That is, one of the recently described species *Hydroclathrus minutus* is consistently segregated from the *Hydroclathrus* main clade. We propose here to segregate *H. minutus* from the brown algal genus *Hydroclathrus* and establish the new monotypic genus *Manzaea* (i.e., *Manzaea minuta* gen. & comb. nov.) based on information on molecular phylogenetics and morpho-anatomy. Morphologically, *M. minuta* is similar to *Hydroclathrus* and *Tronoella* in having clathrate (net-like) and spreading thalli but is differentiated from the latter two genera in having membranous thalli that are sometimes interadhesive resulting in portions of the thallus forming amorphous clumps. Additionally, *Manzaea* is distinguished from both clathrate genera in having thick-walled medullary cells and short closely arranged quadriseriate plurangia. Phylogenetic analyses (Maximum Likelihood and Bayesian Inference) based on single (plastidial *psa*A and *rbc*L genes) and concatenated (*cox*3 + *psa*A + *rbc*L) genes showed that *M. minuta* is consistently segregated from the highly supported clade of *Hydroclathrus* species and often clustering with *Tronoella* and/or *Rosenvingea*. Our proposal further increases the diversity of monotypic genera in the Scytosiphonaceae and underscores the need to conduct further studies on tropical seaweed biodiversity. **(Author's abstract)**

Keywords: *Brown seaweed, Hydroclathrus, Japan, Phylogeny, Taxonomy, Biology*

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0095

Marine Macroalgal Reference Culture Collection at the University of the Philippines Marine Science Institute (UP-MMARCC): Status and prospects for advancing Philippine phycology

Lastimoso, John Michael L. , Guerta, Christian Ace T. , SantiaÃ±ez, Wilfred J

Seaweeds research in the Philippines—from studies on their diversity, natural products chemistry, and the utilization of their derivatives—is largely based on spot collections of large and conspicuous components of the seaweed flora found along the coasts. Such efforts are often focused on commercially important seaweeds; thus, most of the smaller and even microscopic seaweeds remain understudied, if not completely overlooked.

Consequently, little to none is known on many aspects of the biology, ecology, and even biochemistry of these components of the Philippine seaweed flora. To understand aspects of seaweed biology and serve as a facility for preserving the genetic resources of Philippine seaweeds, we established the Marine Macroalgal Reference Culture Collection at the University of the Philippines Marine Science Institute (UP1MMARCC). We are currently maintaining 446 seaweed strains (or isolates) collected from several coastal and offshore areas in the Philippines, the latter including the Kalayaan Island Group in the West Philippine Sea, and 25 isolates from Okinawa, Japan. To our knowledge, the UP-MMARCC is the most diverse and widely sampled culture collection in the Philippines so far. Moreover, our preliminary molecular-assisted biodiversity studies suggest that UP-MMARCC houses several isolates that are either new records to the Philippines or putative new taxa. We anticipate that with continued support, we will be able to sustain and expand our culture collection, not only to facilitate discoveries but also to cater to the needs of the Philippine seaweed industry and in support of its call for diversifying our seaweed commodities and their products. **(Author's abstract)**

Keywords: *Germling emergence method, Marine biodiversity, Seaweed culture, Pacific Ocean, Tropical seaweeds, rbcL, Biology*

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0096

Masturbation in a Free-ranging Male Long-tailed Macaque *Macaca fascicularis* (Raffles, 1821) on Mindanao Island, Philippines

Chavez, Jr., Joselito B. , de Cadiz, Aleyla E. , Cabrera, Shiela Mae E. , delos Reyes, Noel Carl L. , Gamalo, Lief Erikson D., Raganas, Aaron Froila

Long-tailed macaques in the Philippines are understudied in terms of ecology and behavior, which includes their sexual behaviors, in their natural habitats. Masturbation is a natural, auto-erotic behavior rarely observed in the wild in most non-human primates. In this paper, we report an act of masturbation by a free-ranging male long-tailed macaque in a beach forest at an eco-tourism site in Tagum City, Mindanao Island, Philippines. The masturbation was performed by a sub-adult male resting on the handrail of a wooden staircase. A few seconds after masturbation, ejaculation was achieved. Although more detailed observations are needed, it is likely that limited access to female mates contributed to the male's self-stimulation. This further calls for more scientific explorations on reproductive and non-reproductive sexual behaviors of long-tailed macaques in the wild. Moreover, this can be crucial for conservation purposes such as its application to the non-invasive collection of semen samples in wild populations. **(Author's abstract)**

Keywords: *Long-tailed macaque, Masturbation, Mindanao, Philippines, Sexual behavior, Biology*

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0097

Molecular Characterization and Antimicrobial Resistance Profiling of *Salmonella* spp. from Onion Leaves Collected from Wet Markets in Metro Manila, Philippines

Siringan, Maria Auxilia T. , Penuliar, Gil M. , Barredo, Glaezel Angeli

Salmonella spp. is the causative agent of salmonellosis outbreaks in poultry and meats, but recent studies have implicated this pathogen in foodborne outbreaks associated with vegetables. Salmonellosis is commonly managed with antibiotics, but antimicrobial resistance has complicated the treatment of the disease. The pathogenesis of *Salmonella* spp. is based on virulence factors such as plasmid-encoded genes and lipopolysaccharide moieties, which can be detected by PCR and serotyping, respectively. Thirteen (13) isolates previously identified and confirmed as *Salmonella* spp. using invA gene-targeting assay were isolated from onion leaf samples collected from wet markets in Metro Manila, Philippines. The isolates were characterized based on the presence of plasmid-encoded virulence gene, serogroup and serotype, and antibiotic resistance profiles using the VITEK®2 system. All 13 *Salmonella* spp. isolates were spvC-negative. O-serotyping revealed the presence of isolates belonging to serogroups C1 (30.8%), C2 (23.0%), and E1 (30.8%). Two isolates (15.4%) did not belong to the serogroups examined in the study. Further, sequence analysis revealed the presence of serovars Newport, Weltevreden, Tennessee, and Anatum. All the isolates were resistant to at least five antimicrobial agents. To our knowledge, this is the first study in the Philippines to establish baseline data for the molecular features and antibiogram profiles of *Salmonella* spp. isolated in onion leaf samples from selected wet markets in Metro Manila, Philippines. Furthermore, this study is the first report on the occurrence of four different *Salmonella* serovars from onion leaves. The data obtained in this study could be used as baseline information and guidance in the implementation of the GAP, monitoring programs of the Department of Agriculture, and the formulation of laws and regulations by policymakers that will address safety issues in fresh produce and quality management principles in farm operations. **(Author's abstract)**

Keywords: *Antimicrobial resistance, Onion leaves, Salmonella, Serogroup, Virulence genes, Biology*

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NP

0098

Molecular Identification of Alginolytic Bacteria from *Sargassum polycystum* (Sargassaceae, Ochrophyta) Collected from Calatagan, Batangas, Philippines

Dumilag, Richard V. , Ruiz, Caesar Fr

Alginate is a hydrocolloid naturally sourced from brown seaweeds. Its oligomerized forms have growing industrial importance with applications in food, pharmaceutical, and material products. The breakdown of alginate is shaped by the facile decomposition of alginolytic bacteria. Although enzymes for alginate degradation are highly sought after (primarily the alginases), species identification of these bacteria is seldomly determined. The aim, therefore, of this study was to molecularly identify the potential alginolytic bacteria from partially decaying *Sargassum polycystum* collected from Calatagan, Batangas, Philippines. Phylogenetic analysis of 16S rRNA sequences showed that bacterial isolates belong to *Klebsiella pneumoniae* and *Vibrio alginolyticus*. The resulting molecular data was supported by various culture tests with indications of alginate degradation activities. Supporting data and/or tests (biochemical and gene expression studies) should be done to definitively confirm the alginate-degrading property of these bacteria. The utility of sequence data for species identification on bacterial isolates improved the ability to assign species names over traditional methods. The findings in this study point toward providing important microbiological resources useful for various industrial applications of alginase. **(Author's abstract)**

Keywords: *16S rRNA, Alginase, Alginate, Klebsiella pneumoniae, Vibrio alginolyticus, Biology*

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0099

Molecular Phylogeny of Three Unarmored Dinoflagellates from Masinloc Bay, Zambales, Central Luzon, with a Description of the Morphology of *Gymnodinium catenatum* H.W.Graham

Azanza, Rhodora V. , Benico, Ga

Unambiguous identification of unarmored dinoflagellates is important in distinguishing toxic from non-toxic species occurring in the coastal waters of the Philippines. In this study, molecular phylogeny inferred from rDNA sequences of *Gymnodinium catenatum, Gymnodinium impudicum,* and *Akashiwo sanguinea* – collected from Masinloc Bay, Zambales, Central Luzon – is reported for the first time. Morphology of *G. catenatum* was critically examined using light and confocal laser scanning microscopy. The three unarmored dinoflagellates were identified as *G. catenatum, G. impudicum,* and *A. sanguinea* based on their phylogenetic positions inferred from LSU and SSU rDNA. Both *G. catenatum* and *G. impudicum* grouped in a well-supported clade of *Gymnodinium sensu stricto,* which includes other genera of unarmored dinoflagellates, confirming the polyphyly of the clade. *Akashiwo sanguinea* separated into four subclades, which is similar to previous reports – with our strain grouping with sequences from Malaysia, Singapore, and China. Cellular characteristics of our *G. catenatum* are congruent with earlier reports particularly its long chain-forming habit (up to 64 cells) and large cell size (44.6–63.3 μm long). Our result is the first verified record of *G. impudicum* and *A. sanguinea* in the Philippines, and the first record of *G. catenatum* as another highly toxic dinoflagellate species occurring in Masinloc Bay. **(Author's abstract)**

Keywords: *Harmful algal blooms, Microalgae, Paralytic shellfish poisoning, Phylogeny, Taxonomy, Biology*

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0100

Morphological and Molecular Study of *Lepista sordida* in Indonesia

Nurhayat, Oktan Dwi , Puspita Sari, Ade Aliyya , Sibero, Mada Triandala , Hermawan, Rudy , Putra, Ivan P

Lepista sordida (Schumach.) Singer (Agaricales) with the unusual growth pattern and stipe character is reported for the first time from West Java, Indonesia. Fresh basidiomata were assessed using morphological and molecular approaches. The morphological characters were observed based on the macro- and micromorphological features. The ITS 4/5 region was used for molecular analysis. A detailed description of basidiomata and the phylogenetic tree is provided. Our result indicated the morphological plasticity of *L. sordida*. This study is the first contribution of *Lepista sordida* based on both morphological and molecular evidence in Indonesia. **(Author's abstract)**

Keywords: *Agaricales, Phylogeny, Plasticity, Taxonomy, West Java, Biology*

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0101

Morphological, Molecular Characterization, and Physico-chemical Analysis of *Trichoderma yunnanense* as Indigosol Golden Yellow Dye-decolorizing Fungus

Sri Kasiamdari, Rina , Rohmawat

Synthetic dyes are more widely used in the *batik* industry; one of them is indigosol golden yellow dye. Decolorization of synthetic dye can be done by fungi. This study aimed to identify a selected fungal isolate from *batik* waste that was capable of decolorizing indigosol golden yellow dye based on the morphological and molecular characteristics, as well as analyze the physico-chemical characteristics of batik effluent. Based on the morphological characterization, isolate K ByT1 was similar to *Trichoderma* and was identified as *Trichoderma yunnanense* by ITS rDNA sequence (OP 420536). Isolate K ByT1 was able to optimally decolorize 96.3% indigosol golden yellow dye at a concentration of 250 ppm with an incubation time of 168 h. The growth of *T. yunnanense* at the incubation time of 48–100 h was in an exponential phase, in which percentage efficiency in decolorization was greatly increased. The existence of an indigosol golden yellow dye degradation process by *T. yunnanense* was indicated by a rough, thick mycelium and the presence of dye attached to the mycelium (SEM observation), as well as the loss of functional groups C≡C bonds, –C=N, chain N=N, aromatic nitro compound, P=O stretch, ortho aromatic, C-Cl stretch, C-S stretch, C-I stretch, and S-S stretch (FTIR analysis). *T. yunnanense* was able to decolorize 34.54% of *batik* waste with an incubation time of 240 h. The indicators of wastewater treatment efficiency – namely, biological oxygen demand (BOD), chemical oxygen demand (COD), total dissolved solids (TDS), sulfide, total suspended solids (TSS), pH, oil, and fat with removal percentages of 32.68, 23.74, 12.69, 56.63, 37.14, 18.21, and 52.78%, respectively. **(Author's abstract)**

Keywords: *Batik waste, Decolorization, FTIR, Identification, Indigosol golden yellow, Trichoderma yunnanense, Biology*

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NP

0102

Morphology, Phenolic Content, and Antioxidant Activity of *Etlingera fimbriobracteata* (K.Schum.) R.M.Sm. and *E. philippinensis* (Ridl.) R.M.Sm. (Zingiberaceae)

Tubongbanua, Jr., Romeo M. , Villafranca-Tuba, Angie Rose , Mendez, Rainear A. , Mendez, Noe P., Acma, Florf

Two of the most studied *Etlingera* species of the ginger family (Zingiberaceae) in the Philippines were *Etlingera fimbriobracteata* (K.Schum.) R.M.Sm. and *E. philippinensis* (Ridl.) R.M.Sm. However, little is known about the biochemical analyses of these species to support their potential as ethnomedicinal plants in the country. Thus, this study was carried out to describe the morphology and determine the phenolic content and antioxidant activity of the ethanolic extracts of the two *Etlingera* species. Data revealed that the two species are correctly identified and their full description, updated distribution, phenology, and habitat and ecology are provided in this paper. The two species are recognizable in both vegetative and reproductive parts. *E. fimbriobracteata* has reddish color towards the base of the pseudo stem, bright yellow flowers incurved upon maturity, and green sterile bracts that form reddish upon maturity, whereas *E. philippinensis* has mandarin to deep red inflorescence and has a long outward labellum. The total phenolic content (TPC) expressed as milligram gallic acid equivalent per gram dried sample (mg GAE/g dried sample) revealed the highest phenolics in the leaves (13.20 ± 0.35 in *E. fimbriobracteata* and 7.21 ± 0.33 in *E. philippinensis*) than rhizomes (1.44 ± 0.04 in *E. fimbriobracteata* and 0.46 ± 0.30 in *E. philippinensis*). Further, total antioxidant activity (TAA) expressed as milligram ascorbic acid equivalent per gram dried sample (mg AAE/g dried sample) was also observed highest in leaves (12.69 ± 0.36 in *E. fimbriobracteata* and 7.22 ± 0.26 in *E. philippinensis*) compared to the rhizomes (1.82 ± 0.01 in *E. fimbriobracteata* and 1.38 ± 0.07 in *E. philippinensis*). The reducing power (RP) expressed as milligram gallic RP equivalent per gram dried sample (mg GPRE/g dried sample) also revealed higher for the leaves (10.16 ± 2.18 in *E. fimbriobracteata* and 7.53 ± 0.80 in *E. philippinensis*) than rhizomes (0.97 ± 0.18 in *E. fimbriobracteata* and 0.09 ± 0.09 in *E. philippinensis*). The high contents of phenolic compounds contribute to the antioxidant activity of extracts from the two species. Based on the correlation analysis, a perfect positive linear relationship was observed among the

TPC, TAA, and RP ($r = 1$, $p < 0.001$). These imply that *E. fimbriobracteata* and *E. philippinensis* could potentially be used as new sources of natural antioxidants. **(Author's abstract)**

Keywords: *Etlingera, Morphology, Philippine endemic species, Reducing power, Total antioxidant activity, Total phenolic content, Biology*

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2023 April,
(Filipiniana Analytics)
NP

0103

Morpho-physiology and Anatomy of the Six Grass Species Growing on Lateritic Soil: Diagnosis of Characters for Phytostabilization of Soils Depleted by Mining

Quimado, Marilyn O. , Luna, Amelita C. , Tinio, Crusty E. , Interior-Hallegado, Irish Danielle, Combalicer, Marily

Due to extensive mining activities, strip vegetation and soil contamination with heavy metals have become common. One of the approaches to ecological restoration is phytostabilization, which uses plants to stabilize and reduce the mobility of heavy metals in the soil. In this study, six species of grasses – namely, *Alloteropsis semialata* (R.Br.) Hitchc., *Cymbopogon citratus* (DC.) Stapf, *Dinochloa acutiflora* (Munro) Soenarko, *Imperata cylindrica* (L.) Raeusch., *Machaerina disticha* (C.B. Clarke) T. Koyama, and *Panicum repens* L. – were collected from a degraded area with lateritic soil in Brgy. Taltal, Masinloc, Zambales, Philippines. The root growth, the direction of roots formed, and mean daily transpiration rate were observed to find a combination of grass species for phytostabilization. Leaf and root anatomical sections were observed using the freehand technique to know the characteristics that enable them to thrive in lateritic soil. *D. acutiflora* was the only species that exhibited horizontal and spreading roots and the fastest root growth among the six species, whereas *A. semialata* and *P. repens* were the deepest penetrating roots among the vertical forming roots. Transpiration rate was the highest at 12:00 PM and is significantly differentiated from 09:00 AM and 04:00 PM – as exhibited by the two exotic species, *I. cylindrica* and *P. repens*. Leaf anatomical features in the transverse section – such as thickened epidermal cell walls (anticline), presence of sclerenchyma caps, extended vascular bundles, and bulliform cells – were observed in the leaves of the six species. Root anatomical features observed were thickened epidermal cell walls (anticline), thick endodermis, and a large cortex filled with intercellular spaces (*P. repens, D. acutiflora,* and *M. disticha*), as well as black spots in the cortex and pericycle (*A. semialata*). Knowing these traits, *A. semialata, D. acutiflora,* and *P. repens* were found suitable for phytostabilization. **(Author's abstract)**

Keywords: *Ecological restoration, Mined-out areas, Phytostabilization, Rhizobox, Transpiration, Biology*

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2022 August,
(Filipiniana Analytics)
NP

0104

A new Philippine record of the monotypic genus *Scorodocarpus* Beccari (Strombosiaceae) from Balabac Island, Palawan

Agoo, Esperanza Maribel G. , Supsup, Christian E. , Domingo, John P

Scorodocarpus borneensis (Baill.) Becc., a tree that exudes garlic or onion smell, was discovered growing in a secondary lowland forest of Balabac Island in the Palawan Biogeographic Region. The tropical tree species also occurs in Borneo, the Malay Peninsula, and Sumatra. Our finding represents the first record of this monotypic

genus from the Philippines. Here we provide information on the taxonomy, morphology, vernacular name, ecology, geographical distribution, conservation status, and local utilization of *S. borneensis*. **(Author's abstract)**

Keywords: *Indalawan, Kulim, Mansado, Olacaceae, Wood garlic tree, Biology*

Philippine Journal of Systematic Biology, Volume No. 15 Issue No. 1, 1-6
2021,
(Filipiniana Analytics)
NP

0105

Two new records of Philippine *Parmotrema* species (Ascomycota) from Mt. Candalaga, Maragusan, Davao de Oro

Divakar, Pradeep Kumar , Dela Tina, Princes Luise C. , Adanglao-Bawingan, P

This paper reports two *Parmotrema* species new to the Philippines, sampled from Mt. Candalaga, Maragusan, Davao De Oro during an initial survey of lichen diversity and distribution on the mountain. This resulted to a total of 32 *Parmotrema* species described from the Philippines to date. The finding confirmed the presence of more undiscovered lichen species in many places around the country, especially in Mindanao. In addition, an updated key for the identification of the known Philippine *Parmotrema* species is given. **(Author's abstract)**

Keywords: *Lichen, Mycology, Parmeliaceae, Parmotrema melanothrix, Parmotrema planatilobatum, Biology*

Philippine Journal of Systematic Biology, Volume No. 16 Issue No. 1, 12-16
2022,
(Filipiniana Analytics)
NP

0106

Notes on the life history of *Tirumala septentrionis palawana* Fruhstorfer 1899 (Lepidoptera: Nymphalidae: Danainae) from Palawan Island, Philippines

Apolonio, Jason Roy B. , Badon, Jade As

The immature stages of the butterfly *Tirumala septentrionis palawana* Fruhstorfer 1899 are described and illustrated from specimens observed in El Nido, Palawan Island, Philippines. **(Author's abstract)**

Keywords: *Apocynaceae, Butterfly, Dregea, Immature stages , Biology*

Philippine Journal of Systematic Biology, Volume No. 15 Issue No. 1, 1-7
2021,
(Filipiniana Analytics)
NP

0107

Notes on the Nest Architecture and Nest Site Characteristics of Mindanao Treeshrew (*Tupaia everetti* Thomas, 1892) from Dinagat Islands, Philippines

IbaÃ±ez, Jayson C. , Senarillos, Tristan L

The Mindanao treeshrew (*Tupaia everetti* Thomas, 1892) is an endemic non-volant mammal species found in the Mindanao Faunal Region in the Philippines. The nest architecture and nest site characteristics of *T. everetti* are described for the first time based on a single active nest documented from Dinagat Islands. The nest was on the ground, built inside a cavity of a dead pandan tree (*Sararanga cf. philippinensis*), and was surrounded by natural vegetation. This nest discovery is a valuable contribution to the minimal existing literature about this poorly studied species, which may be increasingly threatened by anthropogenic impacts. As such, we highly recommend more nest search and breeding ecology studies on Dinagat islands and other areas where *T. everetti* is found to determine if the nesting pattern is similar to what was discovered in this study. **(Author's abstract)**

Keywords: *Breeding ecology, Natural history, Nest architecture, Nest characterization, Non-volant mammals, Tree cavity, Biology*

Philippine Journal of Science, Volume No. 152 Issue No. 2, 725-729
2023 April,
(Filipiniana Analytics)
NP

0108

Occurrence and Distribution of Philippine Warty Pig (*Sus philippensis* Nehring, 1886) in Mt. Banahaw de Tayabas, Luzon Island, Philippines

Dimalibot, Judeline C. , Vega, Renato S.A. , de Guia, Anna Pauline O. , Cabanas, Al J

This study determined the occurrence and distribution of Philippine warty pig (*Sus philippensis*) in Mt. Banahaw de Tayabas using camera trapping and indirect signs. The Philippine warty pig is an endemic species of wild pig in the Philippines and is currently listed as Vulnerable on the IUCN Red List because of the presence of several threats such as hunting, habitat fragmentation, and the current outbreak of African swine fever (ASF). Camera trap stations were established with 10 camera traps functioning 24 h for 17 d along different elevations. Different species distribution models (BIOCLIM, DOMAIN, and MAXENT) were constructed using 19 bioclimatic predictors to determine the potential distribution of the species in Mt. Banahaw. Results from three different SDMs suggested that Philippine warty pigs prefer to occupy secondary growth forests, as a high probability of occurrence was observed within 600–800 m above sea level (masl). Models also predicted that Philippine warty pigs occupy large portions of Mt. Banahaw de Tayabas, although sparsely in the extreme southern and northern sections of the mountain. The most reliable model that predicted the distribution of the species was MAXENT, as it acquired the highest area under curve (AUC) among the three SDMs. This study confirmed the presence of Philippine warty pigs in Mt. Banahaw de Tayabas and its preferred habitat. The data and information generated here will be useful for the local community's plans in conserving and managing this endemic species. Additional recommendations also include investigating the population size within and outside the protected area and establishing baseline data to assess the impact of ASF. **(Author's abstract)**

Keywords: *Camera traps, Distribution, Habitat, Species distribution model, Biology*

Philippine Journal of Science, Volume No. 151 Issue No. 5, 1605-1621
2022 October,
(Filipiniana Analytics)
NP

0109

Onychothemis yvonneae spec. nov. (Odonata: Libellulidae), a new dragonfly from a lowland riverine forest in northern Palawan, Philippines

Villanueva, Reagan Joseph T., Beijnen, Jonah

The Cleopatra's Needle Mountain Range (CNMR) in northern Palawan includes one of the largest remaining patches of primary forest in the Philippines and has a high conservation value. To provide scientific baseline information to recognize the CNMR as a protected area, biologists mapped its biodiversity during fieldwork conducted from October to December 2014. The present study proposes a new species of *Odonata* discovered during the survey. *Onychothemis yvonneae* spec. nov. is described, illustrated, and compared with its nearest allies. The new species is the second member of the genus *Onychothemis* in the Philippines and is the seventh known overall. *Onychothemis yvonneae* appears to be most closely related to *O. testacea* and *O. tonkinensis.* **(Author's abstract)**

Keywords: *Anisoptera, Biodiversity, Cleopatras Needle, Entomology, Biology*

Philippine Journal of Systematic Biology, Volume No. 15 Issue No. 1, 1-4
2021,
(Filipiniana Analytics)
NP

0110

Organoleptic and Physicochemical Characterization of Ethnic Smoked Pork Delicacy (*Kinuday*) Produced by the Ibaloy Indigenous People in Cordillera, Philippines

Chua, Consuelo T. , Luna, Myrna Benita Z. , Garambas, Cynt

Descriptive sensory analysis was implemented to characterize 24- and 36-h smoked samples of pork delicacies (*kinuday*) native to the Ibaloy indigenous people in the Cordillera, Philippines. Twenty-four (24) English lexicons and their corresponding local terms were generated by eight trained panelists to describe *kinuday* samples. Characteristics of samples smoked for 24- and 36-h smoking duration in terms of color, texture, visual dryness, aroma, saltiness, and smoky flavor were compared. Smoking duration modifies the organoleptic characteristics of *kinuday* – particularly its uncooked outer skin and lean color, the cooked inner lean color, saltiness, and smoky flavor. When color is analyzed objectively, the color of skin, fat, and lean considering smoking duration as a factor is very distinct, distinct, and with a slight difference, respectively. **(Author's abstract)**

Keywords: *Ibaloy indigenous group in Benguet, Organoleptic characterization, Philippines, Traditional smoked pork delicacy (kinuday), Biology*

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2022 August,
(Filipiniana Analytics)
NP

0111

Ovitrap Monitoring of *Aedes aegypti* and *Aedes albopictus* in Two Selected Sites in Quezon City, Philippines

Resilva, Sotero S. , Hila, Abigaile Mia J. , Rebua, Eleanor A. , Obra, Glenda B., Lees, Rosemary S. , Mamai, Wa

In recent years, *Aedes* mosquitoes have become a serious health threat in the Philippines, causing a dramatic increase in dengue incidence. To design and implement adapted vector control measures, knowledge of vector

composition and abundance is essential. Surveillance of mosquito populations using ovitraps was conducted for about two years (from April 2018–February 2020) in two selected sites (Sitio Payong and Villa Beatriz in Old Balara, Quezon City). These areas were identified as potential sites for small-scale pilot trials of the sterile insect technique. *Aedes aegypti* and *Ae. albopictus* were present in both sites, but *Ae. aegypti* was about 20 times more abundant than *Ae. albopictus*. There was a significant difference between the two sites in the number of eggs collected weekly but not in the OI. The number of *Aedes* spp. eggs collected were found to positively correlate with the maximum daily temperature. These data provide comprehensive, evidence-based information that will help in the design and implementation of *Aedes* control measures, as part of wider public health interventions for prevention and control. **(Author's abstract)**

Keywords: *Climatological parameters, Dengue vector, Ovitrap index, Population monitoring, Sterile insect technique, Biology*

Philippine Journal of Science, Volume No. 151 Issue No. 5, 2021-2030
2022 October,
(Filipiniana Analytics)
NP

0112

Parajapyx giecuevasae n. sp., the first Parajapygidae (Diplura) from the Philippines

Lit, Jr., Ireneo L. , LucaÃ±as, Cristian C. , Alviola, Marne

Parajapyx giecuevasae, n. sp., the first Philippine member of the Parajapygidae and the second reported Diplura from the Philippines, is described from Mt. Makiling, Laguna. It is distinct from other *Parajapyx* species by having the following combination of characters: mandible with five teeth and three denticles; prescutum of metanotum with 2+1 setae; tergite X with 12+1+12 macrosetae and 10+1+10 normal setae; and subcoxal organ with 4 accompanying setae, 9 glandular setae and 5 sensorial setae. **(Author's abstract)**

Keywords: *Arthropoda, Entognatha, Hexapoda, Parajapyx, Taxonomy, Biology*

Philippine Journal of Systematic Biology, Volume No. 16 Issue No. 1, 39-44
2022,
(Filipiniana Analytics)
NP

0113

Perceptions on the extent of *Cocos nucifera* toddy collectors' food safety practices: A basis for integration of food safety in the science curriculum

Antiquando, Nova M

This study intended to determine the extent of food safety practices as perceived by the *Cocos nucifera* toddy collectors where one hundred forty (140) coconut toddy collectors from the different areas of Guihulngan City serve as respondents. The study is descriptive and correlational in nature and based from the results of the respondents â€“ toddy collectors' responses. The set of questionnaires is based on the Good Manufacturing Practices (GMP) of the Philippine National Standards. Frequency Distribution, Percentage, Weighted Mean, t-test, and Pearson Product-Moment Correlation Coefficient are the statistical tools. The findings reveal that the respondents' average age is 53 years old, and of low literacy. The least experienced of whom have worked in 1-5 years, the rest 17-24 years. The average household size is about 5.5 and most depend on toddy collection for their livelihood. Two groups of respondents are examined as to their hygienic practices perceptions and their actual practices. As the number of work experience increases, the use of the more modern and hygienic metal screw cap was used as lid for toddy containers, the rest used guava (*Psidium guajava*) leaves. Both groups do not essentially

differ in their perception on safety practices except the one cited on container lids. Neither does their profile, except that the more experienced used the more hygienic metal screw cap, as cited earlier. In summary, according to the respondents' perceptions, their hygienic practice, in all facets of their toddy collection, is quite high. But if we take into account, their hygienic practices have still a lot to be improved. **(Author's abstract)**

Keywords: *Food safety, Cocos nucifera, Toddy collectors, Science curriculum, Biology*

Luz y Saber, Volume No. 13 Issue No. 2, 22-29
2019,
(Filipiniana Analytics)
NP

0114

Perspective: We Stand on the Shoulders of Giants — A Tribute to Long and Productive Careers in Science

Ferner, J

One of the primary characteristics of practicing science is our reliance on the discoveries and insights of those that came before us. When embarking on a scientific research project we first consult our mentors and the available literature. We network with other scientists and form collaborations with others in our field. A long and productive career such as that of Angel C. Alcala, to which this journal issue is dedicated, is an excellent example of how important a career in science is to both the scientific community and the advancement of civilization. **(Author's abstract)**

Keywords: *A.C. Alcala, Careers, Mentors, Collaborators , Biology*

Philippine Journal of Systematic Biology, Volume No. 14 Issue No. 2-A, 1-3
2020 July,
(Filipiniana Analytics)
NP

0115

Phylogenetic Study of Philippine Pigs (*Sus scrofa* L.) from Ifugao and Kalinga Based on Mitochondrial DNA D-loop Analysis

Ju, Yu-Ten , Li, Kuan-Yi , Aquino-Ang, Genevieve Mae B. , Mendioro, Merlyn S. , Diaz, Ma. Genaleen Q. , Vega, Renato S.A. , Cruz, Rick Julius D. , Basilio, Jr., Elpidio B., Laude, Rit

Conservation genetic studies for Philippine pigs are essential to sustain global biodiversity. To study the phylogenetic relationship of Philippine pigs, 79 samples were collected from Ifugao (n = 41) and Kalinga (n = 38) provinces located in the Cordillera Administrative Region, northern Philippines. Mitochondrial DNA control region analysis was undertaken to investigate the phylogenetic relationship between the pig populations from the two provinces and other Asian and European pig breeds. Fourteen (14) haplotypes (H1–H14) were detected in the Ifugao and Kalinga samples. Several haplotypes – specifically, H1, H4, H9, H12, and H14 – formed an independent clade with the Type I Lanyu haplotypes, which are known to be unique in Taiwan pigs. The remaining haplotypes (H2, H3, H5–H8, H10, H11, and H13) clustered with the haplotypes of other Asian pig breeds within the major Asian clade. These results suggest the close relationship between Kalinga and Ifugao pigs and Type I Lanyu pigs. The existence of duplicate motifs also revealed that the native pigs from Ifugao and Kalinga belong to a distinct genetic lineage that clustered with other Philippine pig samples and separate from other Asian pigs, whereas the other samples may represent a recent introgression of modern lineages. **(Author's abstract)**

Keywords: *Genetic diversity, Haplotypes, Mitochondrial DNA, Phylogenetics, Biology*

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(Filipiniana Analytics)
NP

0116

Plankton Community Structure of the Aquaculture Ponds in Marilao and Meycauayan, Bulacan, Philippines

Cabillon, Yves Christian L. , Pleto, John Vinc

The Marilao-Meycauayan-Obando River System of Bulacan was included in the dirty 30 rivers list in the world by the Blacksmith Institute in 2008. The river system, which is heavily polluted with organic matter and heavy metal, plays an important role in the aquaculture industry in Bulacan. With this pollution, organisms are known to be affected. One of which are the microscopic plankton, which serve as a primary food for fishes and can be indicators of pollution. The study focused on the composition of the phytoplankton and zooplankton communities in fishponds along the MMORS. Horizontal towing of about 3 m long was done on the surface water of the pond to collect freshwater plankton using a net with a mesh size of 64 microns. The plankton samples were immediately fixed in 10% formalin solution and were identified and enumerated. The collection of samples was done during the dry (April 2015) and wet (June 2015) seasons. The major identified groups of phytoplankton belong to Bacillariophyta, Chlorophyta, Cyanophyta, Cryptophyta, and Dinophyta, whereas the zooplankton belongs to the group of Copepoda, Rotifera, and Isopoda for all the sampling collection. Statistical analysis showed that phytoplankton density has a significant positive correlation with zooplankton density and chemical oxygen demand. Indicator species such as *Microcystis*, which might cause minor fish kills in ponds, were observed. Other species such as *Peridinium* and *Rhodomonas* indicate discoloration in the water. Diatom species such as *Nitzchia, Tabellaria*, and *Fragilaria* indicate that the water is polluted because these are pollution-tolerant species. *Brachionus*, which is a zooplankton species, indicates organic pollution in water. The low diversity index of plankton on ponds indicates that the water is polluted. This study provides baseline information on the biodiversity of the plankton community, which is essential in aquaculture. **(Author's abstract)**

Keywords: *Biodiversity index, MMORS, Phytoplankton, Zooplankton, Biology*

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2022 December,
(Filipiniana Analytics)
NP

0117

Plant Growth Promoting Potential of Indigenous Mine Tailing Nitrogen Fixing Bacteria and Commercial Biofertilizers on Narra (*Pterocarpus indicus*)

Anarna, Juliet A. , Aggangan, Ne

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 cm-2, 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. **(Author's abstract)**

Keywords: *Arbuscular mycorrhizal fungi, Azospirillum, Biofertilizer, Leguminous plant, Biology*

Philippine Journal of Crop Science, Volume No. 44 Issue No. Special Issue,
2019,
(Filipiniana Analytics)
NP

0118

Production of High-maltose Syrup from Selected Rice (*Oryza sativa* L.) Bran by Enzymatic Method

Torio, Mary Ann O. , Castillo-Israel, Katherine Ann T. , Elegado, Francisco B. , Diopol, Garry A., Uy, Lawrence Yve

Rice bran is an underutilized rice by-product. This study develops a methodology to enzymatically produce high-maltose syrup from rice bran of PSB Rc18. Rice bran liquefaction was conducted sequentially by screening, and optimization using response surface methodology (RSM) to determine the optimum condition for dextrose equivalents (DE). The DE upon liquefaction was affected by α-amylase concentration, rice bran concentration, temperature, and pH. The highest DE of 15.6% was attained by a combination of 30% of rice bran concentration, 0.12% of α-amylase concentration, 80 °C, and pH 5 for 60 min. These optimum conditions of DE acquired in liquefaction were carried over in the saccharification process for maltose conversion of rice bran using RSM. The maltose conversion was affected by DE, temperature, and pH. The saccharification process yielded the highest maltose conversion of 47.78% acquired in combination with 15.6% DE, 335 units of β-amylase, 50 °C, and pH 5 for 24 hr. **(Author's abstract)**

Keywords: *High-maltose syrup, Oryza sativa L., Response surface methodology, Rice bran, Biology*

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2023 April,
(Filipiniana Analytics)
NP

0119

Pteridophyte Diversity in the Samar Island Natural Park (SINP), Samar Island, Philippines

Schneider, Harald , Hongmei, Liu , Buot, Jr., Inocencio E. , delos Angeles, Marjo

Despite major efforts over the last 100 years assembling notable large amounts of information concerning the rich fern and lycophyte diversity of the Philippines, we still lack records for many areas including localities selected to protect biodiversity. Addressing the major gaps in our knowledge about the current distribution of plants in the Philippines is a crucial step towards the implementation of effective protection measurements to halter the ongoing biodiversity crisis. This study has been conducted to assemble a checklist of ferns and lycophytes occurring in the

forests over limestone in Paranas, Samar Island Natural Park (SINP), Philippines. The Samar Island is of special interest not only to studies aiming to reconstruct the history of plants in the Philippines but also to our efforts to conserve this diversity in the Anthropocene. By field investigations in a series of transect walks and in combination with published fern records from online resources, a total of 139 fern species belonging to 59 genera and from 22 families were documented. About 18.7% of the recorded species were endemic to the Philippines. Two species *Tectaria macleanii* (Copel.) S.Y.Dong and *T. psomiocarpa* S.Y.Dong were considered to be endangered whereas *Taenitis cordata* (Gaudich.) Holttum and *Pyrossia splendens* (C.Presl) Ching were listed as vulnerable in the Philippines. This study provided the first comprehensive checklist of the fern and lycophyte diversity that has been protected in this natural park. However, we want to stress that further field exploration is required to improve our understanding of the fern and lycophyte diversity in the less explored parts of the Samar Island. Given the occurrences of several species with rather restricted occurrences including endemics, our study emphasizes the high value of the SINP to preserve the Philippine's plant diversity.. **(Author's abstract)**

Keywords: *Biodiversity, Conservation, Endemic species, Ferns, Kaigangan, Lycophytes, Biology*

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2022 October,
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NP

0120

Quality Changes of Green Mussel (*Perna viridis*) at Different Steaming Conditions

Nacional, Loda M. , Sumogod, Angeleca A. , Gamez, Clarence P. , Baldoza, Bernajocele Jalyn S. , Endoma, Jr., Leonilo F., NuÃ±al, Sharon N. , Mueda, Ros

This study investigates the effects of different steaming temperatures (80, 90, and 100 °C) and time (2, 4, and 6 min) combinations on the quality and safety of green mussels. Analyses were conducted on steamed green mussel meat to determine the optimum steaming conditions based on its morphometric, microbiological, and physico-chemical properties. Results showed that steaming at 80 °C for 2 min provides high meat yield, reduced the total APC by 90% and decreased *Escherichia coli* counts by 75%. However, it is important to increase the steaming temperature to 90 °C (for 6 min) or 100 °C (for 2, 4, and 6 min) in order to eliminate *Salmonella* spp. and *Vibrio* spp. in steamed mussels. Meanwhile, increasing the steaming temperature at 100 °C (for 2, 4, and 6 min) could lower the acidity of steamed mussel meat (at pH 6.8), which may increase expressible drip loss and leaching of nutrients such as lipids and proteins. The steaming method as a thermal shocking procedure to deliver minimally-processed green mussels is a practical yet crucial in achieving safe microbiological levels without compromising its yield and physico-chemical properties. **(Author's abstract)**

Keywords: *Bacterial reduction, Drip loss, Primary processing, Thermal shocking technique, Water holding capacity, Biology*

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NP

0121

The real deal: the ant species, *Pheidole sauberi* (Hymenoptera: Formicidae), first description of the queen and first record of a mermithergate in the Philippines

Buenavente, Perry Archival C. , General, David Emman

The occurrence of mermithism in ants is reported for the first time in the Philippines. The mermithergate worker and previously undescribed dealate queen of *Pheidole sauberi* are described. The mermithergate worker is intermediate in size between the major and minor workers and pale yellow in color, in contrast to the brown healthy workers, and has a much larger gaster than either uninfected subcaste. Colony demographics and nest ecology are also reported. This find offers an opportunity for interdisciplinary research on ant parasitism. **(Author's abstract)**

Keywords: *Transect survey, Mindanao, Mermithism, Entire nest series, Biology*

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2021,
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NP

0122

First record of blacknape large-eye bream *Gymnocranius satoi* (Perciformes: Lethrinidae) in the Philippines

Carpenter, Kent , Williams, Jeffrey T. , Rey, Jade Tifany , Flores, Nicko Amor, Santos, Mudjeke

The Philippines has been regarded as the center of the center of marine shorefish biodiversity, having the highest number of fish species per square area in the world. The blacknape large-eye bream, *Gymnocranius satoi*, has been reported to occur from Southern Japan, Taiwan to Northwestern Australia and to the Coral Sea, but has not previously been recorded from the Philippines. From 2011 - 2019, the National Fisheries Research and Development Institute (NFRDI) collaborated with the National Museum of Natural History of the Smithsonian Institution (NMNH/SI), USA, and the Old Dominion University (ODU), Virgina, USA, to inventory all commercial fish species sold in fish markets around the Philippines. During three (3) fish market surveys (Dumaguete City Market, Negros Oriental; Claveria Public Market, Cagayan, Northern Luzon; and Tabaco City Market, Albay, Southeastern Luzon in 2013, 2016 and 2017, respectively), we collected and eventually identified using morphological and DNA barcoding (COI) analysis, seven (7) specimens of *G. satoi*, representing the first records of this species from the country. Since the potential to discover new species and first records of fish species in the Philippines is high, further taxonomic study of the genus Gymnocranius is needed. **(Author's abstract)**

Keywords: *Marine biodiversity, Conservation, Fisheries, DNA barcoding, Taxonomy, Biology*

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2021,
(Filipiniana Analytics)
NP

0123

First Record of Culturable Microbial Communities Associated with the Freshwater Sponge *Spongilla alba* in Lake Taal, Philippines

Urrutia, Miguel Gabriel Z. , Medalla, Milen Angelie R. , Nicolas, Ellha Mae Nicole M. , Magdalaga, Marlan T. , Manzano, Joe Anthony H., Llames, Lloyd Christian J. , Macabeo, Allan Patrick G. , Papa, Rey Donn

Sponge-microbe symbiosis is considered among the most primitive ecological relationships between metazoans and microorganisms. There is strong interest in understanding the occurrence of microbial communities in sponges due to their integral roles in host ecology, nutrient cycling, and production of potential bioactive secondary metabolites. However, most studies on sponges have been centered on marine species. In this study, the freshwater sponge *Spongilla alba* and its associated microorganisms were explored for the first time. Sponge samples collected from Lake Taal were taxonomically identified using gross morphology and spicules analysis. Both

bacterial and fungal isolates were culturally characterized and molecularly identified using 16S rRNA gene for bacteria and ITS for fungi. Five bacterial species were identified as *Pseudomonas* sp., *Enterococcus* sp., *Stenotrophomonas* sp., *Stenotrophomonas maltophilia,* and *Pseudomonas mosselii* plus eight fungal species with spore sizes from 5–10 μm were identified as *Colletotrichum truncatum, Trichosporon asahii, Rhizopus microsporus, Puccinia striiformis* f. sp. tritici strain, *Talaromyces columbinus, Phoma* sp., *Phomopsis* sp., and *Lichtheimia ramosa*. Phylogenetic analysis revealed microbial sequences belonging to Proteobacteria (n = 4), Firmicutes (n = 1), Ascomycota (n = 4), Zygomycota (n = 2), and Basidiomycota (n = 2). The study reports infrequent occurrences of *Enterococcus, Stenotrophomonas, Puccinia,* and *Lichtheimia* species as freshwater sponge-associated microbes. This also presents the culturable microbial composition of freshwater sponges and rare occurrence of marine- and terrestrial-associated fungi *T. asahii, R. microsporus, Phoma* sp., *Phomopsis* sp., *C. truncatum,* and *T. columbinus* in a unique freshwater ecosystem such as Lake Taal. **(Author's abatract)**

Keywords: *Freshwater sponges, Lake Taal, Freshwater-associated microorganisms, Sponge-microbe symbiosis, Sponge microbiota, Biology*

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NP

0124

First Record of Ophiophagy in Philippine Groundsnake *Stegonotus muelleri* on the Non-banded Philippine Burrowing Snake *Oxyrhabdium modestum*

Sanguila, Marites Bonachita , Magdua, Al

The Philippine groundsnake *Stegonotus muelleri* is a non-venomous colubrid widely distributed in the Mindanao Pleistocene Aggregate Island Complex. Despite the species' regular sightings and occurrence in field surveys, sparse is known about its natural history, including its dietary habits. Although ophiophagy is frequent among elapids, *Stegonotus muelleri* has not been specifically reported to consume snakes. We provide the first account of ophiophagy in a colubrid snake, *Stegonotus muelleri*, on a lamphrophiid snake, *Oxyrhabdium modestum*, providing a glimpse into the species trophic role as a snake-eating predator, and suspected post-feeding behavior (limited mobility and aboveground perching spot) – essential information that augments the gaps in our understanding of the species' natural history. **(Author's abstract)**

Keywords: *Ophiophagy, Feeding ecology, Colubrid, Species interaction, Mindanao Island, Biology*

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NP

0125

Rediscovery of the Presumed Extinct Philippine Quillwort *Isoetes philippinensis* Merr. & L.M. Perry (Isoetaceae) and New Insights on its Morphology and Ecology

Chatto, Nathanie Joy S. , Lagumbay, April Joie D. , Coritico, Fulgent P. , Amoroso, Victor B., Polizon-Manubag, Janece J

Isoetes philippinensis, a critically endangered site-endemic lycophyte, was rediscovered after the last collection in 1969. The present study elucidates the morphology and ecology of the species – which have not been fully investigated – by describing the detailed morpho-anatomical characters, collecting water samples for physico-chemical analysis, and providing an *in situ* description of its habitat. The diagnostic characteristics of the species

included long microphylls (up to 63 cm long), cobwebby megaspores and microspores, and the presence of velum. The morphology of *I. philippinensis* exhibits the features of other aquatic, amphibious and terrestrial species of *Isoetes* – such as the presence of lacuna in the roots, air chambers in the leaves, reduced stele, and abundance of parenchyma cells throughout the organs. Water-quality values are within the minimum acceptable limit. Threats to the population of *I. philippinensis* are discussed and characterized as Critically Endangered (CR A1c, B2a). The information presented here is vital for both in situ and ex situ conservation of the species. **(Author's abstract)**

Keywords: *Morpho-anatomy, Submerged aquatic plant, Type locality, Water quality, Biology*

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(Filipiniana Analytics)
NP

0126

First Report of Possible Shark Predation on an Irrawaddy Dolphin, *Orcaella brevirostris* (Owen in Grey 1866) in the Philippines

de la Cruz, Dhorlyn G. , Atienza, Monica Marie R. , Hisu-an, Jozette G. , Bais, Carlo B. , de la Paz, Manuel Eduardo L., Dolar, Ma. Louell

This report describes the first documented incident of a possible shark predation on an Irrawaddy dolphin (*Orcaella brevirostris*) in the Philippines. The incident happened in Guimaras Strait, one of the four known habitats of Irrawaddy dolphins in the country. We list three possible shark species that may have attacked the dolphin: great white shark (*Carcharodon carcharius*), tiger shark (*Galeocerdo cuvier*), and bull shark (*Carcharinus leucas*). Triangular cuts on the bite wound and a similar habitat shared between Irrawaddy dolphins and bull sharks suggest the latter to be the likely predator. This information contributes to our knowledge of natural threats that contribute to the reduction of the population of this critically endangered species. **(Author's abstract)**

Keywords: *Conservation, Feeding ecology, Marine mammals, Natural threats, Predation, Biology*

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NP

0127

Report on the Implications of COVID-19 Pandemic on Scientists in the Philippines

de la Cuesta, Frances Nicole B. , Vital, Pierang

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has inflicted more than 280 million people all over the globe for around two years. It has impeded all functions, including the science community. To assess the extent of the impact that COVID-19 brought on the research quantity and quality of Filipino scientists, a survey was disseminated to 107 scientists who work in the fields of applied science, engineering science, natural science, physical science, and social science – providing the socio-economic and professional demographics of the participants. Results show that factors – such as gender, field of science, cohabitation, and age group – individually do not pose significant differences in the research quality or research quantity during the pandemic. However, combining these various factors showed significant differences, both positive and negative. Further, several focus group discussions (FGD) were performed to have a deeper understanding of the situation of the scientists during the pandemic. During the FGD, the direct implications of COVID-19 on participants' work-set up were discussed, what steps they and their institutions have done to cope with the pandemic, and the suggestions they have for the

Philippine government. The FGD was analyzed into three thematic themes – namely, challenges faced by the participants and how they cope, mitigating actions done by their institutions, and the scientists' attitude towards institutional and national programs. Providing a stronger vaccination program, overhauling the procurement system, improving the efficiency of government institutions, and creating realistic research planning and funding management are the highlights of the policy recommendations offered to have better post-pandemic handling and management. This is the first systematic and comprehensive study in the Philippines regarding the impacts of the COVID-19 pandemic on scientists. **(Author's abstract)**

Keywords: *COVID-19, Pandemic response, Research publication, Science, Scientist, Biology*

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(Filipiniana Analytics)
NP

0128

Residence Time Models and *Pyrodinium* Blooms in Matarinao and Murcielagos Bays, Philippines

Lumayno, Sanny David P., Sanny David P. Lumayno, Garry A. Benico, Aletta T. YÃ±iguez, Irene D. Alabia, Ian Quino D.G. Fernandez, Rex Delsar B. Dianala, Rhodora V. Azanza, Cesar L. Villan

This is the first report on hydrodynamic models to determine current and water residence time patterns for Matarinao and Murcielagos bays in the Philippines, which have a long history of harmful algal blooms (HABs). Field surveys were conducted in Matarinao Bay in April and August 2010 and in Murcielagos Bay in February 2011. Hydrodynamic models of the bays were developed, and spatially explicit water residence times were estimated from the models based on rates of concentration decrease of a tracer within the bay. Both bays exhibited two distinct areas – the mouth with faster current flow and low residence time, and the head area with slower current flow and higher residence time. During the southwest monsoon, the residence time at Matarinao Bay was 5 d longer than that during the northeast monsoon. Phytoplankton sampling in both bays confirmed blooms of *Pyrodinium bahamense*, but the spatial distribution did not consistently correlate with the simulated residence time patterns. While residence time plays a significant role in algal blooms, extraneous factors may also influence the distribution of phytoplankton within embayments. **(Author's abstract)**

Keywords: *Harmful algal bloom, Matarinao Bay, Murcielagos Bay, Pyrodinium bahamense, Residence time model, Biology*

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(Filipiniana Analytics)
NP

0129

Response of Three Cacao (*Theobroma cacao* L.) Varieties to Biochar and Microbial Inoculation

Aguilar, Edna A. , Aggangan, Ne

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. **(Author's abstract)**

Keywords: *Acidic soil, Grafted cacao, Beneficial microbes, Biology*

Philippine Journal of Crop Science, Volume No. 44 Issue No. Special Issue,
2019,
(Filipiniana Analytics)
NP

0130

Safety Assessment of a Fungal-based Red Colorant Produced by *Monascus purpureus* MTCC 25436

Estrellana, Cyrene D. , Garcia, Jayson F. , Tambalo, Fides Marci

Pigment production by *Monascus* species for application to a wide array of food products has been explored in many countries. However, possible contamination with citrinin, a mycotoxin, has been a concern with different *Monascus*-based products leading to a regulated usage of the microbial food additive worldwide. In the Philippines, there is no known local large-scale producer of microbial pigments. A red colorant from *Monascus purpureus* MTCC 25436 was successfully produced and patented by the National Institute of Molecular Biology and Biotechnology–University of the Philippines Los Baños (NIMBB-UPLB). The produced colorant was subjected to various safety assessment tests to determine its safety for food applications. The AMES test determined that the product was not capable of inducing reverse mutations in *Salmonella typhimurium* mutant strains, and this non-mutagenicity of the colorant is further confirmed by the mammalian micronucleus test. Establishing the LD_{50} was done to determine the lethal dose of the colorant. No model animal died, even after feeding with the highest allowable experimental concentration. Based on the dermal sensitization test, the colorant was a very weak sensitizer. Lastly, detection of citrinin was done using high-performance liquid chromatography. According to the generated chromatograms, citrinin was at non-detectable levels. In conclusion, the colorant obtained from the local strain *M. purpureus* MTCC 25436 is safe for consumption. The results of the study can be used by the local regulating agencies as a baseline for possibly crafting regulations for the registration of microbial-derived food colorants, which the Philippines currently lacks. **(Author's abstract)**

Keywords: *Citrinin, Microbial pigment, Monascus, Natural colorant, Safety assessment, Toxicity tests, Biology*

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NP

0131

Screening *Rafflesia* and *Sapria* Metabolites Using a Bioinformatics Approach to Assess Their Potential as Drugs

Parikesit, Arli Aditya , Ramadhan, Arfan Tri Kusuma , Cristy, Ghea Putri , Agatha, Aggy , Teixeira da Silva, Jaime A. , Zen, Tresa Variyani , Raihandhany, Reza , Wicaksono, A

The Rafflesiaceae family consists of three genera of parasitic plants – *Rafflesia, Rhizanthes,* and *Sapria* – with purported ethnobotanical and ethnomedicinal properties. In this study, the inhibitory properties of 21 characterized metabolites associated with *Rafflesia* and *Sapria* were tested against eight proteins linked to human diseases – including seven pathogenic-associated HMGCR, VEGFR2, acetylcholinesterase, NMT, H1N1 neuraminidase, GSK3-β, and estrogen receptor α, and one plant-pathogenic associated *Colletotrichum* chitin deacetylase. Each metabolite was tested using drug-likeness screening, screening metabolite activity, and molecular docking to eight diseases and microbial physiological processes. Hydrogen bonds and hydrophobic interactions between metabolite ligands and protein residues were characterized. Molecular dynamics were also assessed to analyze the stability of the protein-ligand interaction. Our results indicate that the gallotannins and flavonol phenolics from *Rafflesia* and *Sapria* display high inhibitory potential against disease proteins. All metabolite-protein pairs displayed stable fluctuations. However, some compounds disobeyed LRO5 drug-likeness and displayed moderate bioavailability and synthetic accessibility, so an improved drug delivery method is required. All 21 metabolites are available in other popular edible plants (mainly tea and certain berries) and could be used to create artificially mixed metabolite-based medicine to prevent the exploitation and endangerment of wild *Rafflesia* and *Sapria* populations. Our activity likelihood screening and molecular docking data indicate that *Rafflesia* and *Sapria* metabolites possess considerable potential as anti-cholesterol, respiratory antiviral, wound-healing, and antifungal properties. To protect *Rafflesiaceae* plants in the wild, metabolites can be assessed from other plant sources and combined as an artificial herbal mix. **(Author's abstract)**

Keywords: *Alkaloids, Ethnobotany, Folk medicine, Phenolic, Rafflesiaceae, Secondary metabolite, Biology*

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(Filipiniana Analytics)
NP

0132

Seed Germination and Seedling Physiological Characteristics of *Cardamine hupingshanensis* K.M. Liu *et al.* (Brassicaceae) under Cadmium Stress

Li, Qi , Amoroso, Victor B. , Han,

Cadmium is a naturally occurring element that can seriously harm food safety and human health with strong biological toxicity. Thus it is necessary to investigate the plants that can be used for phytoremediation of the metal. Therefore, the physiological mechanism of *Cardamine hupingshanensis* K.M. Liu et al. tolerance to cadmium for phytoremediation technology was conducted. The results showed that: [1] the germination potential, germination rate, germination index, and activity index of *C. hupingshanensis* increased at first and then decreased along with the increase of cadmium concentration; [2] with the increase of cadmium concentration, the root length, plant height, number of leaves, and weight per plant increased at first and then decreased, *i.e.* when the cadmium concentration is 1 mg/L, the chlorophyll content is slightly higher than the control, and when the cadmium concentration is greater than 1 mg/L, the chlorophyll content gradually decreases; [3] the relative conductivity and malondialhehyde of *C. hupingshanensis* increased gradually with the increase of cadmium concentration, and both were significantly higher than the control when the cadmium concentration was greater than 50 mg/L; the activities of superoxide dismutase, peroxidase, and catalase were stimulated; the glutathione peroxidase was significantly higher than the control at cadmium concentrations of 100 and 200 mg/L; [4] the absorption coefficient of *C. hupingshanensis* gradually decreases with the increase of cadmium concentration, whereas the transport coefficient is slightly affected by the increase of cadmium concentration. The average value of the ratio of cadmium concentration in the aboveground part to that in the underground part is 1.17. This shows that *C. hupingshanensis* is a plant with a super enrichment capacity for cadmium. **(Author's abstract)**

Keywords: *Cardamine hupingshanensis, Cadmium, Hyperaccumulated plant, Seed germination, Seedling growth, Biology*

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NP

0133

Seedling Growth and Mineral Uptake of Eucalyptus pellita with Different Mycorrhizal Inoculants in Central Kalimantan, Indonesia

Aggangan, Nelly S. , Moon, Heu

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.** (Author's abstract)

Keywords: *Arbuscular mycorrhizal fungi, Ectomycorrhizal fungi, Mineral elements, Biology*

Philippine Journal of Crop Science, Volume No. 44 Issue No. Special Issue,
2019,
(Filipiniana Analytics)
NP

0134

Species re-identification based on photographs of Ocean sunfishes (Family Molidae) from Philippine waters, including reconfirmation of *Mola alexandrini*

Sawai,

Detailed biological information (e.g. distribution, size, sex) on ocean sunfishes/molids (Molidae) in Philippine waters is lacking. Four species of ocean sunfishes from Philippine waters are known to date: Mola mola (Linnaeus, 1758), Mola alexandrini (Ranzani, 1839), Masturus lanceolatus (Liénard, 1840), and Ranzania laevis (Pennant, 1776). However, in recent years, the taxonomy of Molidae (especially the genus Mola) has progressed at the global level, and it becomes necessary to review species that occur in Philippine waters. In this study, photographs of Molidae from Philippine waters were collected and morphological research involving museum specimens was conducted. The results of species re1identification based on the photographs of 12 specimens of Molidae obtained in this study were as follows: a specimen of M. alexandrini, five specimens of M. mola, and six specimens of Ma. lanceolatus. Although a specimen identified as M. alexandrini in a previous study was here re-identified as M. mola, the occurrence of M. alexandrini in Philippine waters was nevertheless confirmed in this study on the basis of another specimen. Mola alexandrini and Ma. lanceolatus were confused with M. mola locally, suggesting the importance of preserving real specimens, photographs and genetic samples. **(Author's abstract)**

Keywords: *Ichthyology, Molids, Morphology, New Record, Taxonomy, Biology*

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2021,
(Filipiniana Analytics)
NP

0135

Spore Production and Root Colonization of *Arbuscular Mycorrhizal* Fungi in Different Media and Levels of Biochar: Their Effect on Growth of *Paspalum notatum*

Iringan, Delfina S. , Aggangan, Ne

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. **(Author's abstract)**

Keywords: *Mycorrhizal inoculants, Mixed inoculant, Glomous, Gigaspora, Acaulospora, Entrophospora, Bahiagrass, Biology*

Philippine Journal of Crop Science, Volume No. 44 Issue No. Special Issue,
2019,
(Filipiniana Analytics)
NP

0136

Threatened and Endemic Seed Plants of Mt. Pantaron Range, Mindanao, Philippines

Galindon, John Michael M. , Tandang, Danilo N. , Guiang, Maria Melanie M. , Lagunday, Noel E. , Legaspi, Mutya L. , Coritico, Fulgent P., Acma, Florfe M. , Amoroso, Victo

Mt. Pantaron Range has no legislation for its protection and has significantly lost most of its forest cover over the years due to land conversion for agriculture and human settlement, construction of national highways, and illegal logging and mining. Floristic inventory was conducted in four sampling sites in Mt. Pantaron Range, Bukidnon to document its threatened and endemic seed plants through repeated transect walks. A total of 133 threatened and endemic species of seed plants were documented. Of these, 41 species were threatened, and 120 were endemic species. Mt. Bungkasan, Pantaron Range harbors 70 (52.6%) species of threatened and endemic seed plants, followed by Mt. Malimumu with 53 (40%) species, Mt. Natampod with 40 (30%) species, and Mt. Nabagkesan with only 19 (14%) species. The checklist of threatened seed plants reported herein represents 4.3% of the

threatened seed plants and 2.6% of the endemic seed plants in the Philippines. Site comparisons using Bray-Curtis cluster analysis in terms of threatened and endemic species composition are relatively low (≤ 33%), implying the uniqueness of the species for each site in the said mountain range. The assemblage of threatened and endemic seed plants in Mt. Pantaron Range calls for immediate conservation endeavors by the stakeholders to warrant the protection of its threatened and endemic seed plants. **(Author's abstract)**

Keywords: *Biodiversity, Bukidnon, Conservation status, Endangered species, Flora, Biology*

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2022 December,
(Filipiniana Analytics)
NP

0137

Tree species inventory and their economic uses in Mt. Agad-Agad, Iligan City, Philippines

Casinillo, Novy Grace B. , Nobleza, Joevina C. , Coritico, Fulgent P. , Medecilo-Guiang, Maria Melanie P., Amoroso, Victo

Iligan City has an estimated 30,000 ha forest cover that is still declining up to this day. Trees are an important part of the vegetation that play a fundamental role for stability, provide services in the forest ecosystem and resources for human consumption. Tree species diversity in Mt. Agad-Agad, Iligan City has not been studied, hence an inventory of trees was conducted to assess their conservation and ecological status including their economic uses. A series of transect walks along the trails were employed. Voucher specimens were collected, processed, and identified. Results revealed a total of 127 species of trees distributed into 40 families and 97 genera. The most represented families were Moraceae with 15 species, Arecaceae and Fabaceae with 9 species each, Euphorbiaceae with 8 species, Burseraceae with 7 species, Rubiaceae and Rutaceae with 6 species each and Anacardiaceae, Meliaceae and Myrtaceae with 5 species each. Of these tree species, 18 are Philippine endemics, 2 Mindanao endemics, 4 (IUCN, 2021-3) and 2 (DENR, 2017-11) endangered, 2 (IUCN, 2021-3) and 5 (DENR, 2017-11) vulnerable, 79 (IUCN, 2021-3) and 6 (DENR, 2017-11) least concern, 5 (DENR, 2017-11) other threatened species, and 5 (IUCN, 2021-3) and 1 (DENR, 2017-11) near threatened. Most of the trees were economically important as food, medicine, timber, handicrafts, building materials and ornamentals. Numerous anthropogenic threats included introduction of non-native tree species for forest rehabilitation, conversion of forest to agricultural land and improper garbage disposal. Results of this study will provide information as bases in the ecotourism program and proposal for Mt. Agad-Agad as Local Conservation Area (LCA) and future directions and implication for restoration and conservation of the remaining forest. **(Author's abstract)**

Keywords: *Assessment, Biodiversity, Conservation, Ecotourism, Flora, Inventory , Biology*

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NP

0138

Typhoon in the Philippines may not negatively affect butterfly diversity, but land use changes does

Covell, Charles V. , Badon, Jade Aster T., Miller, Jacqueline Y. , Emmel, Thomas

The Philippines experiences an average of 20 typhoons annually and how they affect the unique biodiversity is still unknown. Data sampling of butterflies between typhoon and non-typhoon seasons in various habitats showed

that typhoons may play an important role in butterfly diversity and community changes. The result also showed that land-use change still has greater negative impact on butterfly diversity than typhoons. This study will pave way for more research on how typhoons affect the diversity, ecology, and population dynamics of various taxa in the Philippines. **(Author's abstract)**

Keywords: *Community disturbance, Lepidoptera, Natural calamities, Rhopalocera, Biology*

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0139

Use and Distribution of *Bangia* cf. *fuscopurpurea* (Bangiales, Rhodophyta) in the Northern Philippines

Yap, Sandra L. , Dumilag, Richard V. , Gamus, Glenn Cedr

Edible seaweeds in the northern Philippines have been reported earlier, but detailed information on the utilization and distribution for most of these recorded species remains limited. A case in point is that of *Bangia* cf. *fuscopurpurea*, locally known as "bubuok," which appeared in a listing of edible seaweeds of the province of Ilocos Norte. A survey across 12 areas in the northern Philippines revealed that knowledge about the use of bubuok is limited only to locals from two sites in Ilocos Norte (Burgos and Laoag) and one site in Cagayan (Claveria). Like most edible seaweeds in the northern Philippines, *B.* cf. *fuscopurpurea* is consumed mainly as a salad. It is not widely sold in the market and is mostly used for personal subsistence. It is confirmed to be thriving in the rocky intertidal areas of Burgos in Ilocos Norte and growing abundantly only during the wet season (November–January). Additional studies on the taxonomy, phylogeography, and possible use of *Bangia* cf. *fuscopurpurea* as a seaweed crop for the northern Philippines are highlighted. **(Author's abstract)**

Keywords: *Burgos, Cagayan, Edible seaweed, Ethnophycology, Filamentous Bangiales, Ilocos Norte, Biology*

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NP

0140

Virtual Screening of Cyanobacterial Metabolites as Inhibitors of SARS-CoV-2 Host Cell Entry, Viral Replication, and Host Immunity Modulation Infective Mechanisms

Quimque, Mark Tristan J. , Pilapil, IV, Delfin YÃ±igo , de Leon, Von Novi O. , Fabian, Angela Maxine G. , Furaque, Emmanuel Louise A. , Concepcion, Aaron Cyrus A. , Fellizar, Viktor Aloysius A., Notarte, Kin Israel R. , Macabeo, Allan Patric

Despite the global effort to recover from the COVID-19 pandemic through vaccine procurements and the development of new treatments, the unpredictable fluctuations of symptomatic cases due to the increase in COVID-19 variants still demand the discovery of additional efficacious antiviral drugs. Cyanobacteria generate a wide array of biologically active secondary metabolites, establishing the domain of cyanotherapeutics. However, the therapeutic applications of cyanobacteria against SARS-CoV-2 are yet to be explored. In this study, 56 cyanobacterial secondary metabolites were screened for *in silico* inhibitory potential against five main target sites of SARS-CoV-2 involved in viral attachment and replication mechanisms. Top-ranked ligands were then subjected to molecular dynamics (MD) simulation. Pharmacokinetic properties and toxicity predictions were also performed. Of the 56 secondary metabolites molecularly docked, compounds 1–7 showed favorable binding

energy ranging from –8.0 to –11.2 kcal/mol against the spike's ACE2 (angiotensin-converting enzyme 2) and GRP 78 (glucose-related protein 78) receptor-binding domains, $3CL^{PRO}$ (3-chymotrypsin-like protease), PL^{PRO} (papain-like protease), and RdRp (RNA-dependent RNA-polymerase). Three compounds – scytonemin (1), a bisindole alkaloid dimer; enterobactin (2), and agardhipeptin A (3) – exhibited the highest binding affinities with BEs ranging from –8.2 to –11.2 kcal/mol. Through MD simulations, scytonemin (1) complexed with the spike RBD, $3CL^{PRO}$, and RdRp, as well as enterobactin (2) complexed with PL^{PRO} demonstrated dynamic stability. Among the three top-scoring lead compounds, scytonemin (1) exhibited drug-like and favorable ADME properties. Hence, the top-scoring compounds from cyanobacteria present as favorable drug prototypes for optimization and *in vitro* testing against SARS-CoV-2. **(Author's abstract)**

Keywords: *ADMET, Antiviral, COVID-19, Cyanobacterial metabolites, Molecular docking, Molecular dynamics simulation, SARS-CoV-2, Bacterial reduction, Drip loss, Primary processing, Thermal shocking technique, Water holding capacity, Biology*

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BOTANY

0141

Azolla (*Azolla microphylla*) Supplementation Improves Nutrient Utilization in Lactating Murrah buffaloes

Dahiya, Satbir Singh , Singh, Pawan Kumar , Singh, Yudhvir , Abraham, Gerard , Jaiswal, Pranita , Mudgal,

Balanced feeding of dairy animals is a costly affair in developing countries due to a lack of sufficient resources. A feeding cum digestion trial was conducted to evaluate the effect of dried green *Azolla* (*Azolla microphylla*) incorporation in lactating Murrah buffalo's diet. Multiparous Murrah buffaloes (n = 10) with an average of 30 d in milk and yielding 11.29 kg/d were distributed randomly into two equal groups. The control group of buffaloes was fed a concentrated mixture prepared with commonly available feed ingredients – including maize grain, wheat bran, cottonseed cake, groundnut cake, mustard cake, mineral mixture, and salt – whereas the concentrate mixture of the treatment group was prepared, including 10% of the dried *Azolla*, by keeping both the concentrate mixtures iso-nitrogenous and iso-caloric. After 3 wk of preliminary feeding, a digestion trial was conducted for the assessment of nutrient utilization in two groups. Results indicated a positive response on the digestibility of dry matter ($P < 0.05$), organic matter ($P < 0.05$), neutral detergent fiber ($P = 0.01$), and acid detergent fiber ($P = 0.015$), whereas the digestibility of crude protein and ether extract remained unaffected ($P > 0.05$). Improvement in the digestibility of different nutrients without influencing the intake of nutrients indicated the importance of dried *Azolla* in the ration of lactating Murrah buffaloes. **(Author's abstract)**

Keywords: *Azolla, Digestibility of nutrients, Iso-nitrogenous and iso-caloric, Murrah buffaloes, Nutrient intake, Botany*

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0142

Diversity of Coastal Phytoplankton in Balayan Bay, Batangas, Philippines

Martinez-Goss, Milagrosa R. , Pascual, Jhaydee Ann F. , Evangelista, Luis

Phytoplankton composition, density, and their relation with 10 abiotic water parameters in six coastal stations [four marine (Anilao, San Luis, Calatagan, and Balayan) and two freshwater (Palanas and Pansipit)] in Balayan Bay, Batangas, Philippines were examined monthly for one year (February 2006–January 2007). A total of 97 taxa of phytoplankton in four phyla were observed. About 85% of these taxa were diatoms (Bacillariophyta). The mean monthly density of phytoplankton ranged from 2,367 (Pansipit Station) to 2,992 units · mL^{-1} (San Luis Station), with as much as 93% of the total phytoplankton density being made up of diatoms. *Cyclotella meneghiniana*, a centric diatom, had the highest mean monthly density (143 units · mL^{-1}) in all the stations. Among the six stations, the marine stations generally showed higher phytoplankton density (maximum monthly value = 4,700 units · mL^{-1}, Anilao, in January), species diversity index (maximum monthly value, H' = 1.402, Balayan, in March), and species richness (maximum monthly value, 29, Balayan, in March) than the freshwater stations. Clear differences were also detected in the physico-chemical characteristics between the freshwater and marine stations. Among the 10 abiotic parameters monitored, mean monthly salinity ranged from 0.92–1.02 psu in freshwater stations and 29.1–32.6 psu in marine stations. Mean monthly water temperatures ranged from 23–33.5 °C and pH ranged from 7.87–8.23. Conductivity in the two freshwater stations ranged from 2,006.17–2,051.92 μS · cm^{-1} and was 45x of that of the marine stations, which ranged from 44.57–50.48 μS · cm^{-1}. Generally, marine stations showed higher values of total solids, total dissolved solids, and total suspended solids than the freshwater stations. However, marine stations recorded greater water clarity than the freshwater stations (mean monthly depth of Secchi disc ranged from 1.68–3.65 m). Freshwater stations recorded higher mean monthly orthophosphate-P values but generally lower nitrate-N values than the marine stations. These values (1.65–4.31 ppm PO_4-P or 0.29–1.41 ppm P; 2.58–5.35 ppm NO3-N or 0.428–1.509 ppm N) are within or near the Philippine standard value of 1.0 ppm for P and N for clean marine water. Changes in some of these abiotic parameters were correlated with changes in the population density of some of the dominant species, to total mean monthly phytoplankton density, species diversity index, and species richness in some of the stations, but no single parameter can explain the biological patterns observed for all stations. No algal bloom was observed during the course of this study, although a potentially harmful dinoflagellate, *Ceratium furca*, was observed. It was never a dominant alga in any of the stations. **(Author's abstract)**

Keywords: *Balayan Bay, Cyclotella meneghiniana, Diatoms, Phytoplankton, Species diversity index, Species dominance, Botany*

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0143

Macrophyte Diversity and Conservation Values of the Verde Island Passage, Philippines

Saco, Jayvee AblaÃ±a , Arcega, John Matthew H. , Valera, Jovy Ann Patchicoy , Rula, Najeen Arabelle M., Ramos-Danila, Khay Ann

The diversity and distribution of marine macrophytes – including seaweeds and seagrasses – in the Verde Island Passage (VIP), Philippines, was assessed covering nine sites across four provinces (Batangas, Marinduque, Occidental Mindoro, and Oriental Mindoro). Presence-absence data were compared to those of other sites within the VIP collected in earlier studies. Data from the VIP were then compared to sites with similar environmental and geographical features in other parts of the Philippines. A total of 116 macroalgal species and nine seagrass species were recorded from the VIP. This macroalgal richness represents approximately 12% of the reported macroalgae, and the number of seagrass species represents almost half of the known species in the country, suggesting that VIP supports a high diversity of marine macrophytes. Data analyses showed significant clustering of sites within the VIP. Some of the neighboring sites with similar environmental conditions also clustered together. The separation of clusters with sites outside the VIP may, in part, be explained by differences in local environmental conditions such as types of substratum, water depth, and current patterns (water motion). The

diversity and uniqueness of marine macrophytes in the VIP highlight the importance of the ecosystem services and functions that these organisms provide. The role of various abiotic and biotic factors in driving variations in macroalgal diversity in the passage needs to be further verified with increased sampling efforts to obtain a more comprehensive understanding of the conservation value of the VIP. **(Author's abstract)**

Keywords: *Biodiversity, Macroalgae, Macrophytes, Seagrass, Seaweeds, Verde Island Passage, Botany*

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NP

0144

Marine Benthic Algae of the Eastern Samar Islands of Homonhon, Sulu-an, and Manicani, Philippines

Evangelista, Luisito T. , Angeles, Jr., Raul , Clemente, Ken Joseph , Pascual, Jhaydee Ann F., Liao, Lawrenc

Botanical explorations in the Philippines have been conducted for the most part in more easily accessible regions, resulting in fragmentary information that prevents a thorough assessment of its total biological richness. Many insular sites, which are potentially biologically diverse, remain unexplored due to reasons of geographic isolation, weather disturbance, and logistical considerations. To address these gaps and to provide added information on the diversity and distribution of the seaweed flora around the country, we report herein records of marine benthic algae from three remote islands in Eastern Samar province. Macrobenthic algae were collected in 18 sites in Homonhon, Sulu-an, and Manicani islands in Guiuan. These algae were identified *in situ* up to the genus level, with their taxonomic status further analyzed in the laboratory at the National Museum of the Philippines. Cluster analysis based on the Jaccard index using PAST Software was used to infer similarities among the sampling sites with respect to their algal flora. Analysis of similarities (ANOSIM) and similarity percentage (SIMPER) were also used to further evaluate the results. This study highlights 56 species (Chlorophyte: 28 spp., Phaeophyceae: 11 spp., and Rhodophyte: 17 spp.) collected in 18 sites in these three islands. These are all new records for these small islands, whereas 41 of them are considered new records for Eastern Samar province. Cluster analysis suggests that similarities or differences in macroalgal flora among the sampling sites may be attributed more to the difference in the type of substrata and hydrodynamics among sites. These results also indicate that these islands have a relatively diverse macroalgal flora representing 5% of the total seaweed flora of the country. This paper is the first attempt to provide better documentation of macroalgal communities in remote islands in eastern Philippines (*i.e.* Guiuan, Eastern Samar). **(Author's abstract)**

Keywords: *Diversity, Macrobenthic algae, Small islands, Species richness, Substrate, Botany*

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NP

0145

Marine Benthic Algal Composition After 45 Years in an Urbanized Bay in Cebu, Philippines

Silapan, Judith R. , Geraldino, Paul John L. , Bataan, Dan Anthony U., Liao, Lawrenc

Coastal ecosystems have been seriously impacted by anthropogenic activities, which are compounded by recent climatic and environmental changes. To provide some evidence of these changes, a study of marine benthic algal composition was conducted by comparing historical (1969–1970) and contemporary (2013–2014) collections in

Silot Bay in Cebu, Philippines. A quantitative survey revealed a total of 30 species of benthic algae (11 red, nine brown, and 10 green) in the historical collections, whereas only 15 species (four each of red and brown plus seven species of green algae) were accounted in the latter years. This decline in the marine benthic algal composition may be attributed to sedimentation, which is indirectly caused by urbanization and human population increase. Altered environmental conditions inside the Bay may also explain the decline and qualitative changes of algal species composition therein. Continued monitoring of the benthic macroalgal composition and environmental parameters may help document anthropogenic impacts on marine ecosystems. Historical herbarium samples represent a valuable yet underappreciated resource for tracking environmental changes through time. **(Author's abstract)**

Keywords: *Anthropogenic impact, Ecological change, Herbarium, Seaweeds, Urbanization, Botany*

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0146

New Name for a Species of *Cinnamomum* (Lauraceae) from the Philippines

Turner

Cinnamomum samarense I.M.Turner is proposed as a replacement name for *Cinnamomum oblongum* Kosterm., a Lauraceae tree endemic to the Philippines **(Author's abstract)**

Keywords: *Stemborer, TRVs, Trichome density, Trichome distribution, Trichome orientation, Botany*

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NP

0147

Phytoplankton Composition during a Period of the Red Tide Bans in 2017 in Irong-Irong Bay, Western Samar, Philippines

Yap-Dejeto, Leni G. , Folio, Fatima

This study assessed the phytoplankton composition in Irong-Irong Bay, Western Samar, Philippines. Recurring red tide bans were imposed in this bay due to the elevated levels of saxitoxin that cause Paralytic Shellfish Poisoning primarily produced by *Pyrodinium bahamense*. Despite the presence of mariculture sites, Irong-Irong Bay has very little or nil data on its overall phytoplankton composition. Monthly field samplings were conducted to observe the phytoplankton community structure during an episode of persistent red tide bans from September–December 2017. Physico-chemical parameters (*e.g.* temperature, salinity, transparency, pH, nutrient concentration) were measured. A total of 64 species of phytoplankton were observed and counted. The lowest mean cell density of phytoplankton was recorded in the month of November (3.1 x 10^4 cells/L), whereas December (37 x 10^4 cells/L) had the highest mean cell density but lowest values for species diversity (*H'* = 0.942), richness (*Dmn* = 0.037), and evenness (*J* = 0.307). *Pseudo-nitzschia* dominated in the months of September (3.1 x 10^4 cells/L) and November (0.43 x 10^4 cells/L), whereas *Skeletonema* dominated in the months of October (9.9 x 10^4 cells/L) and December (29 x 10^4 cells/L). *Pyrodinium bahamense* was present in all sampling months with a total mean cell density of 0.08 x 10^4 cells/L but was never the dominant species. The low cell count relative to other *Pyrodinium* blooms may be accounted for by the presence of *Noctiluca scintillans*, its potential predator. *Noctiluca scintillans* was present in all sampling months. It peaked during the month of November with a mean cell density

of 0.32 x 10^4 cells/L. A significant negative correlation was detected between the cell densities of these two dinoflagellates, providing evidence of the potential interactive relationship between these two species. **(Author's abstract)**

Keywords: *Green Noctiluca bloom, Irong-Irong Bay, Phytoplankton, Pyrodinium bahamense, Botany*

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0148

Seagrass Factor in Climate Change Mitigation in the Philippines

Fortes, Mig

Despite their importance, seagrasses are facing a global decline due primarily to increased nutrient loading and sedimentation resulting from deforestation and agriculture, and, more recently, from seawater warming in shallow coastal waters. With the advent of new technology and a concerted understanding of seagrass ecosystems as vulnerable social-ecological systems, there has been a dramatic increase in the number of studies focusing on the effects of climate change on seagrasses. Here, I provide an account of the status, role, and future of Philippine seagrasses in an era of climate-driven environmental change. I have gathered information from published studies and actual accounts to identify potential commonalities in the effects of climate change and the responses of seagrasses across the molecular, community, and ecosystem levels. Occupying 13.3% or 4,826 km of the total length of the Philippine coastline, seagrass species composition and diversity remain relatively stable. The seagrass beds of the Philippines and Southeast Asia are declining at an estimated rate of 2.62% or 391 km^2 yr^{-1}. Coupled with the apparent neglect in accounts of global carbon, this decline indicates a potential to lose an effective source of blue carbon useful in mitigating the impacts of climate change. In this study, I evaluate the combined effects of climate change with other environmental stressors on the ecosystem services of seagrasses and emphasize the need to apply the lessons learned from three decades of local studies to provide a more inclusive science-based knowledge of seagrass-climate interaction and a deeper understanding of the ecosystem's resilience. I conclude by presenting the most significant knowledge and management gaps and future directions for seagrass research in the Philippines. **(Author's abstract)**

Keywords: *Blue carbon, Climate change, Mitigation, Philippines, Seagrass, Botany*

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0149

Tracking Iodine Decrease in Commercially Sold *Caulerpa racemosa* (Forsskål) J. Agardh (Chlorophyta, Ulvophyceae) during Storage

Yap-Dejeto, Leni G. , Berones, Kathleen A

Iodine is known as an essential mineral for thyroid hormone production in humans. It is water-soluble and diffuses into the atmosphere, where it is thought to break ozone molecules. *Caulerpa racemosa* (Phylum Chlorophyta, Class Ulvophyceae, Order Bropsidales) is a common dietary seaweed believed to be a good source of iodine in the Philippines. As of this writing, there is no record of iodine concentration measurements in harvested *C. racemosa* from Philippine waters. There is an expected decrease in iodine concentrations from harvested *C. racemosa* through time. But how fast it decreases and how much of it remains in the seaweed if stored for days is

also unknown. This study measured iodine concentration in *C. racemosa* samples from an area in the Philippines and calculated the daily changes in iodine level concentrations of harvested *C. racemosa* that were stored. Titration analyses were done every 24 h, with factors such as the algal age, temperature, light, among others, kept constant. Storage conditions were adapted from how local vendors store leftover seaweed merchandise. Results revealed a decrease in iodine levels over time ($y = –20.438x + 228.99$; $R^2 = 0.8937$). The initial concentration (at dry weight) of iodine measured was 196 ppm and dropped to 94.8 ppm on the seventh day. Iodine levels of freshly picked and stored *C. racemosa* were also compared with the recommended daily iodine intake for humans. **(Author's abstract)**

Keywords: *Algae, Caulerpa racemosa, Iodine, Macroalgae, Seaweed, Botany*

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NP

CHEMISTRY

0150

α-Glucosidase Inhibitors from the Bark Extract of Ethno-Antidiabetic *Ceriops tagal* (Perr.) C.B. Rob

Tsai, Yi-Hong , Korinek, Michal , Wagh, Vitthal D. , Villaflores, Oliver B. , Lawag, Ivan L. , Canusa, Bernard S., Chang, Fang-Rong , Aguinaldo, Ma. Alici

The bark of *Ceriops tagal* has been used in the Philippines for folk treatment of diabetes mellitus (DM). Through an α-glucosidase inhibition assay guided isolation, constituents from the detannified methanolic bark extract were isolated and identified to be methyl 2,4-dihydroxy-3,6-dimethyl benzoate (1), isopimar-7-ene-15S,16-diol (2), betulinic acid (3), lupeol (4), and methyl 2,4-dihydroxy-6-methyl benzoate (5). Compounds 3 (IC_{50} = 5.31 μM) and 4 (IC_{50} = 55.84 μM) showed a more potent activity against α-glucosidase than the positive control, 1-deoxynojirimycin (IC50 = 79.16 μM). This is the first report on the presence of the weakly active compounds (1, 2, and 5) (IC_{50} > 75 μM) in the genus *Ceriops* and the first report on the biological activity of Compound 2. Enzyme kinetic studies suggested that betulinic acid is an uncompetitive type of inhibitor, with lupeol as a non-competitive type. This study provides evidence on the possible mechanism of the antidiabetic property of *C. tagal* associated with its traditional use. It supports the possible utilization of the bark for development to prevent or treat diabetes. **(Author's abstract)**

Keywords: *#945-glucosidase inhibitors, Antidiabetic, Betulinic acid, Ceriops tagal, Lupeol, Rhizophoraceae, Chemistry*

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2022,
(Filipiniana Analytics)
NP

0151

Antibacterial and Antioxidant Activities of Ethanolic and Water Extracts of Stingless Bees *Tetrigona binghami, Heterotrigona itama,* and *Geniotrigona thoracica* Propolis Found in Brunei

Hashim, Fatimah , Abdullah, Nurul Aliah , Taha, Hussein , Zullkiflee, Nadzirah, Usman, A

In the present study, the antibacterial activities of ethanolic and water extracts of propolis produced by stingless bees *Tetrigona binghami, Heterotrigona itama,* and *Geniotrigona thoracica* found in Brunei against four different bacterial strains were quantified. Additionally, spectroscopic and colorimetric methods, including Fourier transform infrared, absorption, fluorescence, aluminum chloride, and Folin-Ciocalteu analyses were used to characterize the propolis extracts. Flavonoid, phenolic, and aromatic acid compounds in the propolis extracts were also quantified, as these compounds are responsible for their antioxidant capacity. The antibacterial activity was determined based on bacterial growth inhibition zones using the disc diffusion, and it was further confirmed by the minimum inhibitory and bactericidal concentrations, which were evaluated using the broth macrodilution method. The propolis extracts exhibited antibacterial activities but were lower compared to streptomycin, which was used as a standard antibiotic. The MIC values of the water extracts were 2500 µg/mL, and those of the ethanolic extracts were in the range of 2500â€'10000 µg/mL, much higher than other reported propolis from different countries. Their MBC test further suggested that the propolis extracts were bacteriostatic. The overall findings evidenced the quantities of the antibacterial and antioxidant properties of the propolis extracts, although the results suggested low antibacterial activities of the propolis extracts from Brunei stingless bees. **(Author's abstract)**

Keywords: *Antibacterial activity, Antioxidant activity, Flavonoid content, Phenolic content, Stingless bee propolis, Chemistry*

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(Filipiniana Analytics)
NP

0152

Archaeomaterial Characterization of Historical-Cultural Pottery from *el Noble Villa de Pila* (Laguna, Philippines)

Asor, Bubbles Beverly N. , Cayme, Jan-Michael C. , Asor, Jr., Ani

Existing studies often treat pottery as a determinant of sociocultural integrity and technical proficiency. It is assumed that the aesthetic design, ceramic style and clay contour of pottery are coherent to material culture definition. As an illustration, Philippine pottery artefacts reflect the coming together of sociocultural, material and technical components. Philippine pottery artefacts were evidenced in different diggings in Pila, Laguna since 1967. Identities of the Philippine artefacts dated from the 12^{th} to the 15^{th} centuries from the Chinese merchants using the Manila-Laguna Bay trading route. From one of the diggings in a private property in Baranggay Pinagbayanan, Pila (Laguna), random samples were gathered, verified and chemically analyze as representatives. Integrated complementary-parallel study (cultural-historical profiling and chemical characterization) on the pottery are used but distinct on the basis of approaches. Profile of the historical pottery from Pila, Laguna was interpreted using secondary source data to organize information. The analytical techniques used in this study were Fourier Transform Infrared (FTIR) spectroscopy and X-ray fluorescence (XRF). The analytical result of sample fragment PPL1, PPL2 and PPL3 were silicon: 64.38 %, 52.07 % and 66.34 % as well as aluminum: 17.76 %, 17.14 % and 16.82 % as major components respectively. Fluxes used were iron: 5.26 %, 18.04 % and 4.65 %, calcium: 1.83 %, 4.64 % and 1.25 % as well as potassium: 8.35%, 2.76 % and 9.30 % respectively. There were elemental traces used as colorants namely: iridium (Ir), manganese (Mn), titanium (Ti), strontium (Sr), lead (Pb) and zinc (Zn). IR spectroscopy of the pottery samples showed approximate peaks assigned to quartz, alumina, calcite, hematite and magnetite. **(Author's abstract)**

Keywords: *Pottery, Fourier-Transform Infrared (FT-IR), Energy Dispersive X-Ray Fluorescence (ED-XRF), Silica, Alumina, Material characterization, Chemistry*

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2019,
(Filipiniana Analytics)
NP

0153

Bioprospecting of Philippine Plants from Northern Samar with Butyrylcholinesterase-selective Inhibitory Activity

Cui-Lim, Karina Milagros R. , Sapico, Camille Ann F. , Acero, Rosemarie Elloisa P., Amor, Evangelin

The World Health Organization identified neurodegenerative disorders, such as Alzheimer's disease (AD), as among the public health challenges that need attention. At present, commercially available AD drugs on the market target cholinesterases. Symptomatic treatment extensively focuses on the inhibition of acetylcholinesterase (AChE) because it plays a major role in the breakdown of the main neurotransmitter acetylcholine. However, recent studies suggest that inhibiting butyrylcholinesterase (BuChE) may be worth exploring because of its emerging relevance to AD. To search for potential selective BuChE inhibitors, 118 plants from Northern Samar, Philippines were investigated. The ethanol extracts of the plants were tested for *in vitro* AChE and BuChE inhibitory activity using Ellman's colorimetric method with modifications. At 100 ppm, 23 out of 118 plant extracts showed AChE or BuChE inhibition greater than 50%. Only 10 of the 23 plant extracts inhibited BuChE selectively, with IC_{50} values ranging from 13.48 ± 3.90 to 177.9 ± 15.8 ppm. The plant extracts with selective BuChE inhibitory activity include those from the stem of *Curcuma zedoaria* Rosc. (Zingiberaceae), bark of *Sandoricum koetjape* (Burm F.) Merr. (Meliaceae), leaves of *Artocarpus heterophyllus* Lam. (Moraceae), stem and bark of *Erythrina variegata var orientalis* Linn. (Leguminosae), leaves of *Andrographis paniculata* (Burm. f.) Nees (Acanthaceae), bark of *Hibiscus tiliaceus* Linn. (Malvaceae), leaves of *Phyllanthus niruri* Linn. (Phyllanthaceae), leaves of *Annona squamosa* Linn. (Annonaceae), and leaves of *Hydrocolyte umbellata* Linn. (Araliaceae). Further research into these plant extracts could yield herbal formulations and drugs that could be of particular interest in neurodegenerative diseases such as AD. **(Author's abstract)**

Keywords: *Alzheimer's disease, Cholinesterase inhibition, Curcuma zedoaria, Erythrina variegata var. orientalis, Medicinal plants, Chemistry*

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0154

Chemistry Takes Center Stage: Stories and Narratives as Tools for Instruction

Reyes, Ron

Chemistry provides a constant interplay among the macroscopic, molecular, and atomistic views of matter requiring chemical educators to devise effective strategies for merging these attributes. Often, educators are challenged on how to progress towards conducive and active learning where students can see vividly through the lens of conceptual understanding. Chemistry has stories to tell; through narratives, we can convey meaning and create synchrony with the world. This viewpoint offers a glimpse into the utility of narrative thinking and storytelling as instructional tools to enable students' conceptual understanding of chemistry. A non-exhaustive outlook on learning difficulties is given along with critical aspects of how active narration touches on human psychological perception and, thus, embeds instructions by synchronizing concepts with the world. **(Author's abstract)**

Keywords: *Chemical education, Chemistry narratives, Science education, Storytelling, Chemistry*

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0155

Classification and Percent Severity of *Pechay* Damage Caused by Cutworm (*Spodoptera litura*)

Villanueva, April Kristine I. , Silva, Mary Jane L. , Manalo, Angelica D. , de Ocampo, Anton Louise P., Florendo, Romel Bria

Agriculture is one of the most important sectors of any country, especially the Philippines. *Pechay* is the sixth-ranking crop for agricultural production in Batangas, according to the Philippine Statistics Authority (PSA). However, *pechay* is constantly threatened by different pests, such as the occurrence of cutworm (*Spodoptera litura*), which primarily feeds on its leaves, stalks, and stems and even cuts off the plants that destroy the entire leaf in no time at all. Detection of the presence of pests at the earliest can help farmers to employ the necessary intervention to mitigate the spread of the infestation. This paper proposes a system that can classify whether *pechay* plants are healthy or damaged and assess the severity of the damage using image processing techniques and machine learning. Images of *pechay* plants are gathered and pre-processed to remove the background, resize, and enhance. Then statistical measures derived from GLCM (gray level co-occurrence matrix) are used with diagnostic feature explorer (DFE) to select the most appropriate features for the classification. The clustering to assess the severity of damage used k-means to segment the damaged areas from the entire leaf. The system can classify healthy and destroyed plants and grade the severity of damage with an accuracy of 88.31%. **(Author's abstract)**

Keywords: *Agriculture, Classification, Feature extraction, Image processing, K-means clustering, Machine learning, Chemistry*

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0156

CO_2 Gas Sensing Performance of Doped Polypyrrole Films

Llanes, Alyssa Marie , Manzano, Enrique M. , Manzano, Maria Carla F. , Librojo, Nathania Renae , Manzano, Daniela Niccole , Lanuza, Chiara Rosario Julia V., Alcantara, Norbert

With the rising global demand and usage of fossil fuels, the concentration of greenhouse gases such as carbon dioxide in the atmosphere has been increasing at an alarming rate. Monitoring of indoor air quality has now become a necessity in maintaining healthy homes and working environments. This endeavor requires accurate and fast-response gas sensors in order to provide on-time and reliable environmental data. The authors report in this study, the carbon dioxide sensing properties of conducting polypyrrole (PPy) films. Free-standing doped conducting polypyrrole films were synthesized and mounted on a fabricated 4x3 sensor array, and were then exposed to environments of varying CO_2 concentrations. Seven of the twelve PPy films in the sensor array demonstrated highly strong correlation to CO_2 levels, with Pearson's correlation coefficient values ranging from 0.714 to 0.992. The PPy film sensors showed high sensitivity with fractional changes in resistance ranging from 1.15% to 38.5% per 100ppm increase in CO_2 levels. This study shows that PPy films have potential as active materials for highly sensitive and fast-response CO_2 sensors. **(Author's abstract)**

Keywords: *Conducting polymer, Polypyrrole, Carbon dioxide, Gas sensor, Chemistry*

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(Filipiniana Analytics)
NP

0157

Effect of Embryo Surface Morphology and Grinder Type on the Particle Size Distribution of Coffee

Garcia, Emmanuel, Quidlat, Franz Gabriel

There has been a growing trend in research where scientists conduct their experiments with industry partners to create a more pertinent output. The coffee industry is particularly interested right now in the Particle Size Distribution (PSD) of coffee grounds. The PSD of coffee grounds has always yielded a bimodal spectrum – it contains a small fines peak with a major peak where the majority of the particle sizes appear. This study aims to investigate what causes this bimodal nature and the factors such as surface morphology, and variations in grinder type affect the PSD of coffee. Particle size plays a crucial role in maintaining and controlling the intensity of flavors extracted from the coffee bean. Moreover, PSD is a major contributing factor in producing consistent cups of coffee – a primary concern of industry members. To evaluate the surface morphology of the beans a manual focusing Scanning Electron Microscope (SEM) was used, while an LS13 320 laser diffraction apparatus was used to evaluate the PSD. SEM analysis revealed significant differences in the surface morphologies of the embryo as compared to the rest of the bean. These differences however did not show to play a role in the bimodal nature of the PSD. Different grinder types showed a marked difference in PSD wherein flat burrs produced less fines when compared to conical burrs. This could mean that flat burrs produce more consistent cups. **(Author's abstract)**

Keywords: *Particle size distribution, Laser diffraction, Bimodal, Chemistry*

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NP

0158

Effect of Maturity on Physicochemical and Fatty Acid Profile of Philippine Pili (*Canarium ovatum* Engl.)

Doma, Natalie G. , Baloloy, Krizza Ashley V. , Millena, Cristopher G., Hernan, Pamel

Pili (*Canarium ovatum* Engl.) is a nut-bearing tree indigenous to the Philippines, known for its high economic value and promising oil quality. The *pili* fruit is considered non-climacteric, making the maturity index of great importance in harvesting. This study evaluated the effect of maturity stages – mature (MS1), unripe (MS2), and ripe (MS3) – on a fully developed kernel on its physical characteristics, proximate composition, oil characteristics, and fatty acid profile. Major changes were noticed in the pulp at different maturity stages. As maturity levels progress, the exocarp darkens significantly from green (L* = 49.64) to black (L* = 15.16), whereas the kernel lightens from green (*a = 1.58 to 3.32) to light-yellow (*b = 26.48 to 22.28). Ripening was accompanied by the kernel's moisture reduction and fat increase in both pulp (0.33–17.56 %) and kernel (45.73–62.31 %). The main fatty acid identified is oleic acid (C18:1), which was highly detected in the pulp. Oleic and palmitic acids in pulp significantly increased along with maturation, whereas polyunsaturated linoleic and linolenic acids decreased ($p < 0.05$). Different fruit maturity stages show distinct characteristics, compositions, and fatty acid profiles. Results show that maturity stages MS2 and MS3 are good harvest standards for kernel and MS3 for pulp utilization. **(Author's abstract)**

Keywords: *Canarium ovatum, Fatty acids, Food composition, Pili nut, Maturity, Chemistry*

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0159

Effect of ZnO and CuO Nanoparticles on Culturable Bacterial Population, Microbial Biomass, and Enzyme Activities in Two Soil Types

Madayag, Roselle E. , Pide, John Lester V. , Fernando, Lilia M. , Villegas, Lucille C. , Delmo-Organo, Nolissa , Basay, Jr., Carlito P., Granada, Shaira Mhel Joy M. , Paterno, Erlind

Metal oxide nanoparticles are widely used in many agricultural, medical, and electronic products. This study was conducted to assess the effects of metal oxide nanoparticles on the total culturable soil bacterial population and enzymatic activities – namely, dehydrogenase (DHA), urease (UA), and microbial biomass (MCB) – using Philippine soils. The factors included the two soil types – Lipa clay loam (LCL) and Sariaya sandy loam (SSL) – and five treatments – namely, copper oxide bulk particles (bCuO), zinc oxide bulk particles (bZnO), copper oxide nanoparticles (CuONPs), zinc oxide nanoparticles (ZnONPs), and untreated control. The experiment was laid out in a split-plot completely randomized design over a 28-day incubation period under laboratory conditions. Results showed no significant effect on the culturable bacterial population. The DHA of ZnONPs-, bCuO-, and CuONPs-treated LCL was significantly reduced up to 7, 14, and 28 days after amendment (DAA), respectively. This result was probably due to the strongly acidic property, high level of organic matter (OM), low permeability due to particle size distribution, and low phosphate concentration of LCL. For UA, it was significantly reduced in LCL by CuONPs up to 28 DAA, perhaps due to the inactivation of soil UA. UA, however, was significantly increased by ZnONPs up to 28 DAA, presumably due to the release of intracellular urease from dead cells due to the toxic level of Zn2+. Soil MCB was significantly reduced at 7 DAA in CuONP-amended LCL and ZnONPs-amended SSL, whereas bCuO- and bZnO-amended LCL had a significant increase in MCB. The effect of CuONPs and ZnONPs on the parameters measured was influenced by soil type. In conclusion, CuONPs could pose a threat to soil microorganisms, especially in clayey soils. **(Author's abstract)**

Keywords: *Metal oxides, Microbial activity, Nanotechnology, Philippine soils, Chemistry*

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0160

Isolates from *Eleusine indica* (Poaceae) Aerial Shoot Fraction Dually Inhibits 5-LOX and COX Enzyme Systems

Toralba, Joanna V. , Santos, Joshua H. , Moreno, Patrick Gabriel G. , Jacinto, Adrien Kyle M., Heralde, Francisco M. , Quiming, Noel

Recent studies supported the use of *Eleusine indica* in inflammatory processes as evidenced by the reduction of lipopolysaccharide-induced inflammation *in vitro* and *in vivo*. The aim of this research was to evaluate the anti-inflammatory activity of *E. indica* in the context of dual inhibition of 5-lipoxygenase (5-LOX)/ cyclooxygenase (COX). Drugs able to block the two main arachidonic acid pathways are of pharmacological interest due to the wide range of anti-inflammatory activity with no ulcerogenic risk. In addition, cytotoxicity screening using the HepG2 and HK-2 cells and analysis of the most active subfraction *via* UPLC-QTOF-MS^{E} were performed. Preliminary screening of the crude methanolic extract and its fractions revealed significant dual 5-LOX/COX inhibition, with no significant difference among the fractions ($p < 0.05$). Ethyl acetate fraction, the most active among the four fractions and found to be rich in phenolic compounds after TLC derivatization, was considered

for further purification and screening at 50 μg mL^{-1}. Among its nine subfractions, subfraction 6 was regarded as the most promising dual inhibitor with a moderately hepatotoxic and nephrotoxic profile. Its median inhibitory concentration (IC_{50}) was found to be 16.47 μg mL^{-1} for 5-LOX, 19.64 μg mL^{-1} for COX-1, and 22.26 μg mL^{-1} for COX-2. Two putative compounds namely Naringenin-7-O-β-D-glucuronide and Tricin-7-O-β-D-glucopyranoside were identified after the mass spectral analysis of subfraction 6. These results confirm that *E. indica* elicits its anti-inflammatory activity by targeting the arachidonic acid metabolic pathways. **(Author's abstract)**

Keywords: *Anti-inflammatory, Arachidonic acid pathway, Dual 5-LOX/COX inhibitors, Herbal medicine, Inflammation, Goose grass, Chemistry*

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0161

Microplastics in Northern Laguna Lake's Shoreline Sediments

Hizon-Fradejas, Amelia B. , Bolante, Cherrylene M. , Manalo, Cervi

Microplastic pollution, a pervasive problem in the natural environment, is hardly investigated in the largest lake in the Philippines: Laguna de Bay or Laguna Lake. This study was done to determine the microplastic profile (content and type) of the shore sediments taken from northern Laguna Lake and to identify possible sources of the microplastics found. The microplastics from the sediments were extracted and isolated using the chemical oxidation and density floatation method. To identify the possible microplastic source, a comparison of Fourier transform infrared (FTIR) spectra of the microplastics extracted with sample plastic materials found on the sites was done. Results showed that during the dry season, the mean microplastic contents of Binangonan, Tanay, and Angono sediments were 1524.42 ± 1593.45, 815.41 ± 593.64, and 295.51 ± 140.16 microplastics per kg sediment, respectively. During the wet season, the mean microplastic contents of the sediments in Binangonan, Tanay, and Angono were 1826.05 ± 614.19, 1250.73 ± 220.03, and 353.82 ± 173.07 microplastics per kg sediment, respectively. The variations observed with season might be associated with tidal and current effects on the shoreline sediments and not due to changes from the dry to the wet season. FTIR analysis of microplastic type showed that prominently occurring microplastics in the three towns varied depending on the materials associated with human activities such as fish farming (aquaculture), clothing materials, and plastic packaging. The results of this study show significant implications on the effect of anthropogenic activities on the type and abundance of microplastics found in the environment, and knowledge of the microplastic profile in Laguna Lake could help not only in its clean-up but also in the proper disposal of plastics in the area to prevent its presence in the natural environment. **(Author's abatract)**

Keywords: *Attenuated total reflectance–Fourier transform infrared (ATR-FTIR), Laguna Lake, Microplastics, Sediments, Shoreline, Chemistry*

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0162

Microwave-promoted Synthesis and Optoelectronic Properties of Ethoxycarbonyl-substituted Coumarin and Benzo[f]coumarin

Creencia, Evelyn C. , Nillama, Joshua Andrew P. , MiÃ±oza,

Microwave-assisted potassium fluoride-catalyzed synthesis of coumarin derivatives *via* tandem Knoevenagel condensation and intramolecular cyclization was established under solvent-free conditions. Satisfactory product yields were obtained with 67.87 and 90.21% as the highest recorded yields for the target compounds 3a (ethyl 2-oxo-2*H*-chromen-3-carboxylate) and 3b (ethyl 2-oxo-2*H*-benzo[*f*]chromen-3-carboxylate), respectively. The changes in the optoelectronic properties of the synthesized coumarin derivatives relative to the parent coumarin (2*H*-chromen-2-one) molecule were also characterized to study, to some degree, the structure-to-property relationship of the compounds. Generally, extending the π-conjugation at position-3 by adding the ethoxycarbonyl group and expanding the π-system of the coumarin molecule at position-*f* shifts the absorption maxima to longer wavelengths, decreases the HOMO-LUMO energy band gap, and increases the light absorptivity of the coumarin compound. **(Author's abstract)**

Keywords: *Coumarins, Microwave, Knoevenagel condensation, One-pot, Optoelectronics, Chemistry*

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0163

Performance of Dye-Sensitized Solar Cells Using Chlorophyll from *Moringa oleifera* as Sensitizer

Payongayong, Bernard G. , Portuguez, Raphael Justin C. , Lorenzo, Allen Christ

Cuprous oxide dye-sensitized solar cells (DSSCs) were fabricated through the use of chlorophyll from malunggay leaves (*Moringa oleifera*) as sensitizers. UVVisible spectroscopy results indicated the presence of chlorophyll in malunggay leaves. Four set-ups, each with replicates, were made: one with no pigment and three with cuprous oxide submerged in the pigment for 24, 48, and 72 hours, respectively. The measured voltage outputs of the DSSCs show that as the time of submersion of the cuprous oxide on the pigment increases, the voltage output produced also increases. In terms of efficiency testing, it was found that the solar cells with chlorophyll-soaked cuprous oxide had a lower efficiency than those with cuprous oxide not soaked in chlorophyll pigment. **(Author's abstract)**

Keywords: *Solar cells, Cuprous oxide, Chlorophyll, Moringa oleifera, Chemistry*

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0164

Physicochemical, ADMET, and Molecular Dynamics Simulations against *Bacillus subtilis* HmoB for Antibacterial Potentiality of Methyl ð • œ¶-D-glucopyranoside Derivatives

Qais, Faizan A. , Chtita, Samir , Hosen, Mohammed A. , Ouassaf, Mebarka , Kawsar, Sarkar M.A., Belaidi, S

Monosaccharide derivatives are important in the field of biological chemistry because of their effectiveness against bacterial pathogens, as well as to synthesize biologically active products. Designing novel antibacterial agents with new structural scaffolds that combat drug-resistant pathogens is an urgent task. Therefore, the present study targets to identify the binding affinity of a series of previously synthesized methyl α-D-glucopyranoside

(MDGP) derivatives with molecular docking and molecular dynamics along with their physicochemical and pharmacokinetic properties. The density functional theory (DFT) calculations were executed for the MDGP derivatives using B3LYP/3–21G, which was also used for the illustration of partial atomic charge and molecular electrostatic potential (MEP). The designed derivatives were evaluated for their antimicrobial activities through a molecular docking study with *Bacillus subtilis* HmoB heme oxygenase by AutoDock. The binding affinity from molecular docking score for Derivatives 8–10 (–10.11, –10.41, and –12.20 kcal/mol) against the bacterial pathogen *B. subtilis* HmoB gives the evidence for being potential antimicrobial agents. Furthermore, a 100-ns molecular dynamics simulation study revealed the stable conformation and binding pattern of MDGP derivatives in a stimulating environment. In addition, *in silico* ADMET study, toxicity and bioactivity parameters were calculated for MDGP and its derivatives for evaluating their safe uses and predicting the pre-study of clinical phases as drug molecules by using software and an online database. Our designed new MDGP derivatives might be exhibited as first-rate and superior pharmacological profiles in medicinal chemistry, which may give the leading information for further studies about their biological activity. **(Author's abstract)**

Keywords: *ADMET, Bacillus subtilis HmoB heme oxygenase, Methyl #945-D-glucopyranoside, Molecular docking, Molecular dynamics, Chemistry*

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0165

Physico-chemical Properties and Botanical Origin of Honey Produced by *Tetragonula biroi* Friese Collected from Select Sites in Batangas, Laguna, Quezon, and Albay, Philippines

Cervancia, Cleofas R. , Manalo, Marlon N. , Polintan, Elmer A. , Evangelista, Von Carlo D.G. , Belina-Aldemita, Ma. Desiree , Micor, Jose Rene L. , Alvarez, Paul Lloyds

Stingless bee (*Tetragonula biroi* Friese) honey from four provinces of the Philippines – namely, Batangas, Laguna, Quezon, and Albay – were characterized by their physico-chemical properties and botanical origin. Determination of color, moisture, electrical conductivity, ash, pH, acidity, hydroxymethylfurfural (HMF), total reducing sugars (TRS), sucrose, and melissopalynological analysis was done on honey samples. The color of the honey samples ranged from extra light amber to dark amber. The percentage moisture of the samples ranged from 22.0 ± 0.0 to 25.8 ± 0.3%; electrical conductivity ranged from 1.28 ± 0.10 to 2.52 ± 0.06 mS/cm; ash content ranged from 0.36 ± 0.05 to 1.27 ± 0.06%; pH values ranged from 3.7 ± 0.0 to 4.0 ± 0.0; total acidity ranged from 149.95 ± 3.45 to 264.44 ± 1.76 meq/kg; HMF content ranged from 18.39 ± 1.18 to 33.10 ± 0.61 mg/kg; TRS ranged from 34.90 ± 0.37 to 39.72 ± 0.07%; the sucrose content ranged from 1.09 ± 0.27 to 10.41 ± 0.26%. Results of the melissopalynological analysis showed 21 pollen types. The properties of honey significantly differ based on location and botanical origin. **(Author's abstract)**

Keywords: *Chemistry*

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0166

Preliminary Assessment of Anomalously High Background Radioactivity in Makinit Hot Spring, El Nido, Philippines

Quierrez, Rico Neil M. , Gibaga, Cris Reven L. , Samaniego, Jessie O. , Tanciongco, Alexandria M., Montano, Marie

Hot springs in the Philippines are found mostly near volcanic regions and are the least places with possibly high background radiation. However, Makinit hot spring in El Nido, Palawan exists not only on the tectonically stable northern Palawan Microcontinental Block but also records anomalously high natural radioactivity. To quantify and determine the nature of radioactivity, this study conducted a preliminary radiological and geochemical study in the vicinity of this hot spring. The measured average specific activities of uranium and thorium were 1528.62 and 920.96 Bq/kg, and these exceed world median values on terrestrial radionuclides in the soil of 35 and 30 Bq/kg by 44 and 31 times higher, respectively. The average values of all seven calculated radiological risk parameters – namely, dose rate with an amount of 13.77 mSv/y, radium equivalent of 2862.10 Bq/kg, external and internal hazard indices of 7.73 and 11.86, respectively, absorbed gamma dose rate of 1271.42 nGy/h, annual effective dose equivalent of 1.56 mSv/y, and excess lifetime cancer risk of 5.46 x 10^{-3} – go beyond reference limits set by the UNSCEAR. The preliminary assessment of spring water physicochemical properties showed that the water temperature is greater than 55 °C and the pH averages around 6.62, indicating weak acid-neutral hot waters and a low to moderate temperature geothermal system. The sediments surrounding the Makinit hot spring were analyzed to be travertine, composed only of calcite, suggesting that the uranium and thorium ions are potentially bonded or are associated with the Ca-bearing mineral. This study can serve as a baseline for further research regarding the source of radioactivity and geothermal heat source and as a consideration for the development of the Makinit hot spring area. **(Author's abstract)**

Keywords: *Geochemistry, Hot spring, Radioactivity, Radiological risk assessment, Palawan, Chemistry*

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0167

A Preliminary Study on the Chiral Vector Approach in Determining the Optimum Structure of Carbon Nanotubes and its Correlation to the Chemical Potential Energy Using Avogadro

Santos, Gil Nonato C. , Uy, Mike Lester D. , Ebriega, Bren Daniel J. , Bajande, James Harris R. , Labios, Justin Rando

In this study, the following quantitative properties of carbon nanotubes were explored: the chiral vectors, which are numbers that describe the carbon nanotubes' structure, and properties such as chemical potential energy. The objective of this study is to simulate various carbon nanotube structures with chiral vectors that range from (0-3) and find a relation between these chiral vectors and the chemical potential energy. Using the software Avogadro, 12 carbon nanotubes with different chiral vectors (n, m) were simulated. These carbon nanotubes were of different lengths to keep the number of atoms in the molecules as close to 100 as possible. Avogadro was also used to calculate the theoretical chemical potential energy of these molecules. Using multiple correlation to analyze the simulations' data, an R2 value of 0.632 was obtained, which indicates a small positive linear association between them. **(Author's abstract)**

Keywords: *Carbon nanotubes, Chiral vectors, Chemical potential energy, Chemistry*

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NP

0168

Proposed Physicochemical Standards for the Identity and Quality Characteristics of Philippine Virgin Coconut Oil

Opao, Philip Gabriel M. , Tantengco, Grace B. , Dayrit, Fab

The growth of the virgin coconut oil (VCO) industry over the past few years has highlighted the need to improve VCO standards to promote better quality and detect adulteration. The Philippine National Standard for VCO (PNS/BAFPS 22:2007) has three groups of parameters – identity characteristics, quality characteristics, and contaminant limits. It has only one identity characteristic – the % fatty acid composition, which is based mainly on Codex Stan 210-1999. However, because the fatty acid composition does not distinguish VCO from refined, bleached, and deodorized coconut oil (RBDCO), additional methods are needed to differentiate VCO and RBDCO and to detect adulteration. This study proposes a new spectrophotometric measurement at 278 nm, which can accomplish both objectives. Regarding VCO quality characteristics, PNS/BAFPS 22:2007 states that VCO should be colorless and sediment-free. However, some VCO products may have light yellow color due to the method of production, and sedimentation naturally occurs below the freezing point of VCO, which is 25 °C. New methods are proposed to address the concerns of color and sediment. Because the Codex methods are optimized for vegetable oils with long-chain unsaturated fatty acids, some methods need to be adjusted for the analysis of VCO, which is composed mainly of saturated medium-chain fatty acids. These standards and methods can be adopted by regulatory agencies and guide the industry to ensure quality VCO. **(Author's abstract)**

Keywords: *Adulteration, Identity and quality characteristics, PNS/BAFPS 22:2007, Refined, Bleached, Deodorized coconut oil (RBDCO), Virgin coconut oil (VCO), Chemistry*

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NP

0169

Synthesis and Characterization of Molecularly Imprinted Polymer as Sorbent for Solid-Phase Extraction of Trans Oleic Fatty Acids

Yu, Derrick Ethelbhert C. , Ebarvia, Benilda S. , Fuertes, Rosa

Labelling of trans fatty acid (TFA) content in foods is mandatory in many countries and being considered in several countries because of the deleterious effect of trans fatty in health and nutrition of the individual. The impact of legislation restricting use of TFA in food products and requiring TFA content on food labels prompts analytical laboratories to address outstanding issues on trans fatty acid analysis. In this work, a molecularly imprinted polymer (MIP) using trans oleic fatty acid methyl ester as template has been prepared by precipitation polymerization method using methacrylic acid as functional monomer, trimethylolpropane methacrylate (TRIM) as cross-linking agent, 2,2-azobis (isobutyronitrile) as the radical initiator and dichloromethane as porogen. This trans-MIP was used as sorbent for the solid-phase extraction of trans oleic fatty acid before injection to the gas chromatograph for quantification. A nonimprinted polymer (NIP) was also prepared using the same procedure but without the addition of the template, trans oleic fame. Template removal was done by soxhlet extraction using methanol-acetic acid (9:1 v/v) as the extraction solvent.

The binding properties of trans oleic fame imprinted polymers were evaluated in different solvent system by equilibrium experiments. A higher difference between the affinity of trans oleic fame to MIP and NIP in heptane and dichloromethane was observed. Scatchard plot's analysis revealed that there were two classes of binding sites populated in the imprinted polymers which indicated that the polymer possesses a heterogeneous binding sites distribution. The stronger affinity binding type exhibits dissociation constant (K_d) 10 times smaller than that of the weaker type with binding capacity of 48.04 ug trans oleic fame/mg MIP. The resulting Freundlich isotherm further demonstrated the heterogeneity of the binding sites of the MIP, with heterogeneity index "a" equal 0.4758 which is less than 1.

The imprinting effect of the MIP was assessed by its performance as sorbent in SPE experiment by varying the

solvent type, time, amount of sorbent and amount of trans oleic fame to obtain acceptable recoveries in each step of the solid-phase extraction. Recoveries in trans-MIP was higher (79.9-87.4%) using methanolacetic acid as the eluting solvent compared to NIP (55.8-68.7%). Polymer characterization was done by scanning electron microscopy and particle size analyzer for its morphology and particle size distribution, respectively. Elemental and FTIR analysis of the synthesized MIP was also done and results showed that the polymerization method was successful. **(Author's abstract)**

Keywords: *Trans Oleic Fatty Acids, Non-imprinted polymer, FTIR, Chemistry*

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NP

0170

Synthesis of Bis(triphenylphosphine)iminium Bromide

Yu, Derrick Ethelbhert C. , Pugeda, Therese Jane , Jaboneta, Anthony La

The study focused on the metathesis reaction of bis(triphenylphosphine) iminium chloride (PNPCl) with sodium bromide (NaBr) which yielded bis(triphenylphosphine) iminium bromide (PNPBr). The cation from the product which is bis(triphenylphosphine) iminium (PNP) serves as a counter ion for molecular conductors to ease electron transport between anions thus aiding in the formation of a regular stacked arrangement of conductors in a solid state. PNPBr was validated by the bromine presence determined by the Halogen Test using sulfuric acid, by comparing the experimental value of the melting point of the product to its theoretical value, and by the elemental composition of the sample in which the elements determined were carbon, nitrogen, bromine, and phosphorus only. Therefore, through these tests the product has a high purity and has a percent yield of 81.56%. **(Author's abstract)**

Keywords: *Bis(triphenylphosphine)iminium chloride, Bis(triphenylphosphine)iminium bromide, Bis(triphenylphosphine)iminium, Chemistry*

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2019,
(Filipiniana Analytics)
NP

COMPUTER SCIENCE

0171

Communication Complexities of Leakage-secure PKE Cryptosystems and Generic Transformations

Labao, Alfonso B., Adorna, Henry

In this paper, we present the communication complexity results of several chosen-ciphertext attack (CCA2) secure public key cryptosystems that are resilient to certain classes of secret key leakage attacks. In particular, we discuss the communication complexity trade-off between cryptosystems and generic transformations that rely on the random oracle model and those that are designed under the standard model. For this purpose, we propose a communication complexity measure for public key cryptosystems that equals the total amount of bits involving the receiver’s public key and a ciphertext transmission by the sender. Using this complexity measure, we show

that random oracle model-based cryptosystems and transformations are more efficient in terms of communication complexity, albeit relying on the stronger assumption that some cryptographic primitives behave like truly random functions. As corollaries of our results, we also address the problem of establishing communication complexity lower bounds by which leakage-secure communication between two parties can occur, and show that our cryptosystems and generic transformations achieve polynomial lower bounds in communication complexity relative to the security parameter of an adversary. **(Author's abstract)**

Keywords: *Cryptosystems, Communication complexity, Public key encryption, Computer science*

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2023 February,
(Filipiniana Analytics)
NP

EDUCATION

0172

The Academic and Licensure Examination Performances of a Bachelor of Science in Nursing Graduates in a State College

Ligligen, Sean Camelon A. , Kiblasan, June

The practice of safe and effective nursing care is what a Bachelor of Science in Nursing graduate can provide based on the established competencies of the curriculum. However, they need to be on the list of registered nurses before entry into practice. This study analyzed the academic and licensure examination performances of Bachelor of Science in Nursing graduates in a state college to ascertain relationships and predictors of the licensure examination as the basis for future planning. Descriptive-retrospective design was utilized where 208 graduates who took their licensure examination from 2013 to 2017 were conveniently chosen. Statistical Package for Social Sciences Version 22.0 was used where Pearson product-moment correlation coefficient and Simple Regression Analysis were employed. The academic and nurse licensure performances of graduates were found lower than the ideal and are opposite in terms of skewness and kurtosis. Moreover, a strong positive relationship was noted between the graduates' performances in their academics and licensure examinations. 5 from 21 nursing courses are significant predictors with strong unique contributions to the nurse licensure examination at which 2 from the 5 were found common in all parts of the examination. Thus, it is vital to always look into predictors as basis in the modification of institutional policy on curriculum implementation. **(Author's abstract)**

Keywords: *Academic performance, Philippine nurse licensure examination, Nursing education, Nursing professional courses, Nursing program, Education*

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2020 July to December,
(Filipiniana Analytics)
NP

0173

Accelerating Research Evidence Translation Through Dyadic Engagement: A developing model for evidence-based practice implementation

Arde, Jr., Bernardo Oli

Evidence-based practice (EBP) has been regarded as the gold standard of clinical practice in the health profession. However, even though the importance of EBP is well documented in the nursing literature, in developing

countries, its implementation remains a challenge. In addition to individual and organizational barriers to EBPimplementation, the existence of the academician-clinician divide is a critical concern. This seeming disconnect has significantly hampered the translation of knowledge into practice. Hence, collaborative dyadic engagements between the academician and clinicians have to be nurtured. The Accelerating Research evidence translation through Dyadic Engagement (ARDE) Model, a pragmatic way of facilitating the enculturation of EBP, is proposed and collaborative efforts in solving clinically relevant nursing issues will pave the way for EBPto become an integral part of clinical practice. **(Author's abstract)**

Keywords: *EBP, Academician, Clinician, Dyadic Engagement, Partnership, Model of Nursing, Education*

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(Filipiniana Analytics)
NP

0174

Benguet State University High School Students' Curiosity, Interest, and Perceptions on Interactive Manipulatives in Mathematics

Dolipas, Bretel B. , Alimondo, Monica S. , Oryan, Serano L. , Lubrica, Joel V. , Buasen, Julie A., Ocampo, Phi

The Benguet State University high school students perceive that their exposure to interactive manipulatives in mathematics can influence their interest to pursue a career path in Mathematics. They claimed that their interest and curiosity in the interactive manipulatives were increased after handling the different manipulatives. Further, the students also claimed that their academic performance in Mathematics could be enhanced, should these interactive manipulatives be used in their classes. Results are true to all students whether they intend to pursue a mathematics-related course or not. These results stemmed from 71 high school students who were asked, through a questionnaire, to give their views after their exposure to the different manipulatives. They were first asked to watch a demonstration of the mathematics manipulatives and were given time to manipulate the devices given some procedures and mathematical concepts as guides. The study suggests that students be exposed to interactive devices to enhance their academic performance in Mathematics and stimulate their interests in pursuing Mathematics related degrees. Likewise, in a setting where the availability of manipulatives is limited, educators should devise practical materials that students can use. Lastly, a quasi-experimental study may be done to verify the respondents' claim that their Mathematics performance can be enhanced when manipulatives are utilized in their classes. **(Author's abstract)**

Keywords: *Interactive manipulatives, Mathematics, Mathematics-related degree, Education*

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2020,
(Filipiniana Analytics)
NP

0175

Competency Appraisal as a Tool in Improving the Board Exam Performance of Benguet State University Bachelor of Science in Forestry Graduates

Sajise, Marycel T. , MATSO, NOVER , Daipan, Bernard Peter O. , Besic, Elvira D. , Parao, Marissa R., Yabes, Melbrenne

For the past years, Benguet State University has devised an appraisal course to improve its national passing average for the forestry board exam. This study evaluated the effects of course competency in preparing Bachelor

of Science in Forestry students for their board exam. Pre-test and post-test of students who enrolled in the course were done to assess students' level of preparation and perception of the various mock exams given and determine the most important factors affecting their performance. Furthermore, a comparison between the actual board exam and mock exam performance was made. Results showed that students have average levels of preparation and marginal expectation in their exam scores. Study habits and subject difficulty are important factors in their preparations. Generally, the course competency was able to help them prepare for the actual board exam. **(Author's abstract)**

Keywords: *Course competency, Performance, Computer-based mock exam, Predictor, Forestry licensure examination, Education*

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2020,
(Filipiniana Analytics)
NP

0176

Factors Associated with Condom use to Prevent HIV Infection: An online survey of Filipino men who have sex with men

Calaguas, Nor

The steady rise in newly-diagnosed cases of Human Immunodeficiency Virus (HIV) has been historically associated with Men-who- have-sex-with-men (MSM) in the Philippines. This has been attributed to low condom use despite longstanding guidance on their efficacy in preventing the spread of HIV among other sexually transmitted diseases. The objective of the study was to describe the sociodemographic and sexual characteristics of an online sample of Filipino MSM, and identify which factors are significantly associated with condom use at last sexual intercourse. Purposive sampling through referrals within the MSM community resulted in a sample of 491 Filipino MSMs. Bivariate analysis revealed that MSM's civil status, gender expression, relationship status, their predominant sexual position, and the sexes of their sexual partners are significantly associated with the use or non-use of condoms during their last sexual intercourse. The study may prove to be beneficial to public health leaders in the implementation of a comprehensive group of interventions to increase condom use. **(Author's abstract)**

Keywords: *Human Immunodeficiency Virus, Men Who Have Sex With Men, Condom Use, Sexual Behavior, Survey Methodology, Education*

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2020 July to December,
(Filipiniana Analytics)
NP

0177

Managing Cognitive Resource Expenditure and Fostering Creative Thinking in Biology Teaching Guided by Instructional Message Design

Orbeta, Tris

The mechanisms within the human cognitive architecture are an integral part of studies that involve knowledge acquisition, teaching approaches, and multimedia instructional design. However, there are limited investigations of these constructs in the context of learning biological concepts, particularly in actual classes. This study examined the effectiveness of a pedagogical intervention guided by instructional message design (IMD) principles in minimizing cognitive overloading while fostering creative thinking among high school biology students. It

utilized a quasi-experimental approach and adopted the two-group repeated measures design. The study involved a total of 61 Grade 11 students from two comparable intact groups. The experimental group experienced IMD-guided biology teaching for a unit of instruction that lasted for 8 wk, totaling 10 class sessions. Data analysis through mixed ANOVA indicated that IMD-guided biology teaching was effective in lowering cognitive resource expenditure (CRE), whereas a one-way ANCOVA showed that the intervention was effective in enhancing student creative thinking. Also, analyses confirmed a negative relationship between CRE and creative thinking. The findings of this research have important implications for instructional design decisions and the development of biology instructional materials that are adapted across varied learning modalities. The use of IMD-guided biology teaching as a cognitive load-based intervention could facilitate the effective learning of complex biology topics by thoughtfully attending to the basic pedagogical components: content, teaching methodology, and instructional materials. **(Author's abstract)**

Keywords: *Biology teaching, Creative thinking, Cognitive load, Cognitive resource expenditure, Instructional message design, Education*

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(Filipiniana Analytics)
NP

0178

A Scoping Review on Factors Affecting the NCLEX-RN Performance of Internationally Educated Nurses

Montegrico,

Purpose: This scoping review aims to describe the factors affecting the National Council Licensure Examination-Registered Nurses (NCLEX-RN) performance of internationally educated nurses (IEN).

Background: The United States relied heavily on IEN to help address the nursing shortage. However, IEN face challenges in passing the NCLEX-RN with almost half failing the NCLEX-RN the first time. There is a lack of studies on IEN, in general, and factors affecting their NCLEX-RN performance, in particular.

Method: A literature review of IEN NCLEX-RN studies from 1994 to 2020 was conducted. The Preferred Reporting for Items for Systematic Reviews and Meta-Analysis (PRISMA) was used to describe the search process.

Findings: Based on the review of the available literature, the most commonly identified factors affecting IEN NCLEX-RN performance include proficiency with the English language, differences in nursing education, and unfamiliarity with the NCLEX-RN. Language, country of nursing education, healthcare experience, support system, the Commission on Graduates of Foreign Nursing Schools certification exam, (CGFNS CE), and time-lag between graduation or initial licensure and NCLEX-RN are statistically significant predictors of NCLEX-RN performance.

Conclusion: Individual, academic, and environmental factors influence IEN NCLEX-RN performance. Identifying these factors can help in designing individual and multi-level interventions to assist IEN to pass the NCLEX-RN. **(Author's abstract)**

Keywords: *Internationally educated nurses, NCLEX-RN, Nursing education, Education*

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(Filipiniana Analytics)
NP

0179

Standardized Tests as Predictors of NCLEX-RN Success

Montegrico,

Purpose: This study examined the predictive ability of Assessment Technologies Institute (ATI) standardized tests on Fundamentals of Nursing (FON), Pharmacology (PHARM), Medical-Surgical Nursing (MSN), and RN Comprehensive Predictor (RNCP) on the National Council Licensure Examination-Registered Nurses (NCLEX-RN) performance of nursing graduates.

Background: Various assessment tools in nursing education are used to predict the success of students in nursing licensure examinations. There are inconsistent findings on the predictive ability of course-specific standardized tests on NCLEX-RN success.

Methods: A retrospective correlation research design was used to determine the association between ATI standardized tests and NCLEX-RN success. Secondary data analysis of 141 ATI student scores from 2017 to 2018 from a Southeastern university in the United States were analyzed using descriptive and inferential statistics, set at 0.05 level of significance. Three models of logistic regression were used to determine the predictive ability of ATI standardized exams on NCLEX-RN success.

Results: ATI MSN standardized test is the strongest predictor of NCLEX-RN success, followed by ATI FON and ATI RNCP tests. ATI PHARM standardized test is not predictive of NCLEX-RN success.

Conclusion: Standardized tests can help in identifying students who are at-risk for failing the NCLEX-RN prior to taking the examination. Understanding the impact of standardized testing on NCLEX-RN performance is essential in addressing the students' ability to become successful in the nursing program and NCLEX-RN. **(Author's abstract)**

Keywords: *Standardized test, Nursing education, ATI, Nursing students, Education*

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0180

Tadek Di E-Sabangan: an Expression of the People of Sabangan's Cultural Identity and Heritage through *Takik* and *Tallibeng* Indigenous Dances

Talangchey, Jess

The indigenous dances of the *e-Sabangan* were passed down from one generation to the next and have been a part of their culture. A focus group discussion (FGD) with the participants of the study disclosed that the way the *e-Sabangan* move and communicate with their bodies is an expression of their way of life. This study aims to identify the indigenous dances prevalent in Sabangan, their purposes, representations, and implications to the *e-Sabangan's* culture, health, and society in general. This study further aims to promote awareness and encourage the preservation of the *e-Sabangan's* cultural heritage. There were 32 participants in this study composed of *barangay* officials, indigenous people's mandatory representatives of *Applai* and *Kankanaey* indigenous peoples groups, and respected community elders of Sabangan, who have knowledge and understanding of the *e-Sabangan's* culture and represent the 15 *barangays* of the municipality. Free, prior, and informed consent was secured from the National Commission on Indigenous Peoples before the conduct of the study. An FGD and prerecorded video documentation of the indigenous dances studied were utilized. Data were analyzed and interpreted based on thematic analysis. Results revealed that the *Takik* and *Tallibeng* dances are performed in various rituals, ceremonies, and occasions that serve essential functions such as community cleansing, thanksgiving, healing, and blessing. Such non-quotidian events are integrated with the *e-Sabangan's* cultural practices which remain relevant in contemporary society. Moreover, cultural values are encapsulated in the

various aspects of the dance such as the dance steps, attires, musical instruments, and chants. To promote and preserve these dances, it is essential to engage the community's indigenous dance experts who can properly teach the *Takik* and *Tallibeng* to younger generations and encourage schools and institutions to provide an avenue wherein to heighten their interest in the *e-Sabangan's* indigenous dances. **(Author's abstract)**

Keywords: *Cordillera, Culture, e-Sabangan, Heritage, Identity, Indigenous dance, Education*

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2023 April,
(Filipiniana Analytics)
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0181

Working Conditions and Turnover Intentions of Teachers in Small Public Junior High Schools of Baguio City

Batani, Ruth S. , Fernandez-Docallas, Fro

This study explored the teacher's working conditions and turnover intentions from six small public junior high schools of Baguio City using a sequential explanatory mixed-method design with 55 survey respondents and 24 interview and FGD participants. Teachers quantitatively described their working conditions as fair, while the majority qualitatively described the same as poor. Quantitative findings also revealed a low level of turnover intentions among teachers, but qualitative data say otherwise. Forcing teachers to pass learners who reasonably need to be retained for the sake of performance-based bonus is one of the cited reasons why teachers develop turnover intentions. However, despite the challenges at work, teachers find fulfillment in their service to young people and â€˜good working relationship with fellow teachers as important coping mechanism. Overall, the study found no significant difference in the teachers' level of perception of their working conditions when grouped according to sex, years in service, and civil status. The level of prevalence of turnover intentions differs significantly according to years in service, and working condition is significantly related to turnover intentions. Teachers' coping mechanisms such as pagtitiis, malasakit, and finding comfort from their kapwa teachers sustained them in their profession. **(Author's abstract)**

Keywords: *Teachers\' working condition, Turnover intention, Performance-based bonus, Intensification of teacher work, Education*

Mountain Journal of Science and Interdisciplinary Research, Volume No. 81 Issue No. 1, 84-99
2021,
(Filipiniana Analytics)
NP

ENGINEERING

0182

Acquisition of 3D Root System Simulation Parameters Using 2D Extracted Image Data and Genetic Programming

Concepcion, II, Ronnie S. , Valenzuela, Ira C. , Galindo, Alezander Mikhail O. , De Leon, Joseph Aristotle R. , Custodio, Jose Miguel F., Vicerra, Ryan Rha

Root studies like propagation and morphological traits unlock a higher-level understanding of plants to better the growth of agricultural crops and maximize farm yields. As they are located underground, there is an additional challenge in elucidating their structure and behavior. Root imaging allows for real-time observations and there

are several known methods. One imaging dataset simulated entire 3D root systems to create 2D images for data analysis and measurements. In this study, the dataset's extracted measurements will be used to reconstruct the true parameters of the simulated 3D root system through the use of multigene symbolic regression genetic programming (MSRGP). Eleven (11) parameters were selected as the output variables, each for monocot and dicot data for a total of 22 MSRGP models. Among these, thirteen of them showed high R^2 values greater than 80%, proving the high accuracy of the MSRGP method. Input variables that were frequently used across multiple models were also noted, such as tip count, exploration ratio, and area. In addition to the accuracy that MSRGP provides in predicting variables, the computation time of these models is found to be as low as a few milliseconds. Once trained, this speed allows the models to be integrated into relevant applications without significant increases in computation cost. **(Author's abstract)**

Keywords: *Data prediction, Genetic algorithm, Multigene symbolic regression, Plant root system imaging, Engineering*

Philippine Journal of Science, Volume No. 151 Issue No. 6B, 2355-2364
2022 December,
(Filipiniana Analytics)
NP

0183

Automated Classification of Selected Philippine Wood Species Using Image Analysis and Artificial Neural Networks

Manalo, Ronniel D. , Daracan, Vivian C. , Urriza, Lyka Mae C. , Cantalejo, Anne Patricia G. , Romano, Arlene D. , Mercado, Rizza D.C. , Madrid, Val Randolf M. , Jacildo, Arian J. , Mendoza, Rosa

This research aimed to address the need of the wood-based sector for a straightforward, rapid, and reliable wood identification tool. This sector includes agencies like the Department of Environment and Natural Resources, wood processing plants, and state universities and colleges. A model using artificial neural networks was developed to automatically perform image-based identification of 20 selected Philippine wood species. It banks on a progressive database containing numerous macroscopic transverse section images taken from authentic samples of the species included in this study. The model has an F1 score of 87.9%. A system usability survey (SUS) was performed to assess the effectiveness of the web application by deploying it to stakeholders who are engaged in wood identification. The SUS results showed that majority of the respondents rated the web application as either good or excellent. An average of 75.6 SUS score or a grade of "B" (good and acceptable) was obtained from the responses received. All 27 respondents indicated that they would recommend the application to other users. For future directions, inclusion of additional species for identification is recommended, given the fact that there are hundreds of species in the Philippines. This will strengthen the capability of the application to have a more precise and accurate wood identification result. Furthermore, the creation of a mobile application and an offline version of this wood identification app will be taken into consideration. **(Author's abstract)**

Keywords: *Artificial neural networks, Automated classification, CLAHE, Image analysis, System usability survey, Wood identification, Engineering*

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2022,
(Filipiniana Analytics)
NP

0184

Carbon Footprint and Climate Change Mitigation Potential of Cocobiodiesel in the Philippines

Magadia, Bernadette T. , Demafelis, Rex B., Gatdula, Kriste

Coco-biodiesel is the only type of biodiesel currently being produced in the country as a response to the biodiesel blending mandate under the Biofuels Law. The blending mandate was supposed to increase from 2% to 5% in 2015, however, due to feedstocks concern, the said increase has not yet been implemented to-date. Other than increasing the country's selfsufficiency, the Biofuels Law has other equally significant objectives which could promote the increase in biodiesel blending in the coming years. One of which is the mitigation of toxic and greenhouse gas (GHG) emissions. This study revealed that pure coconut methyl ester or cocobiodiesel in the Philippine setting has a carbon footprint or global warming potential of 38,976.87 ton CO2e for every 30 million liters per year (MLPY) or 39.34 gCO2e/MJ, which is 53.05% lower than the carbon footprint of diesel (fossil fuel). For 2016 alone, 2% and 5% biodiesel blending has a potential GHG savings or avoided GHG emissions equal to 241,736.20 tonsCO2e yr^{-1} and 604,335.49 tonsCO2e yr^{-1}, respectively. These findings suggest that mandating the use of coco-biodiesel reduces the GHG emissions in the Philippine transport sector – an effort in line with the governments' thrust of mitigating climate change and being one of the active parties of the Paris Agreement for Climate Change. **(Author's abstract)**

Keywords: *Biodiesel carbon footprint, Climate change mitigation, Coco-biodiesel, Philippine biodiesel, GHG emission reduction , Engineering*

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2020 December,
(Filipiniana Analytics)
NP

0185

Development of Rice Yield Model Using C-Band Sentinel-1A Data

Saludes, Ronaldo B. , Dorado, Moises A. , Relativo, Patrick Lemuel P., Sta. Cruz, Pomp

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. **(Author's abstract)**

Keywords: *c-band, Remote sensing, Rice yield model, SAR, Sentinel 1A, Engineering*

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2020 August,
(Filipiniana Analytics)
NP

0186

Effects of Dehydration on the Bioactive Compounds of Waste Onion Leaves

Landoy, Rona Joyce B. , Dizon, Lisa Stephanie H. , Capunitan, Jewel A. , Demafelis, Rex B. , Borines, Myra G., Rodriguez, Raymund

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. **(Author's abstract)**

Keywords: *Bioactives, Conventional drying, Dehydration, Flavonoids, Freeze drying, Gallic acid, Onion leaves, Phenolics, Quercetin, Thiosulfinates, Vacuum drying, Engineering*

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2020 April,
(Filipiniana Analytics)
NP

0187

Evaluation of Geochemical Signature in Soil Sampled from a 2004 Indian Ocean Tsunami-stricken Region in Aceh Province Located in the Western Part of Indonesia Using Scanning Electron Microscopy–Energy Dispersive X-ray (SEM-EDX) Spectroscopy and Its

Ismail, N. , Ramli, M. , Mitaphonna, R., Idris

Chemical elements in soil samples collected from the area struck by the massive Indian Ocean tsunami on 26 Dec 2004, were identified using scanning electron microscopy–energy dispersive X-ray spectroscopy (SEM-EDX) to find out potential candidates for the geochemical signature of the 2004 Indian Ocean giant tsunami. All tsunami-affected soils were collected from three areas in Aceh Province, Indonesia, the worst stricken region by the Indian Ocean tsunami in 2004. SEM analysis showed that the damaged soil samples exhibited smaller particles and an inhomogeneous particle size distribution, which could be attributed to dissolved chemical element sedimentation after flooding by tsunami saltwater. Moreover, our findings revealed that the tsunami-affected soil samples contain many chemical elements – including marine signatures (Na, Ca, Mg, K, Al, and Si), terrestrial sources (Ti and Fe), and organic components (C and O). Organic elements detected as oxygen (O) dominated those impacted soils from the Aceh region, accounting for more than half of all samples, followed by carbon (C) and silica (Si). Furthermore, the concentration ratio of a series of elements in those impacted soils – namely, Si/Ti, Si/K, and Fe/Ti – demonstrates values that are exclusively different among the various elements evaluated in this work. The distinguishing difference in the concentration ratios of the elements matches well with X-ray fluorescence (XRF) measurement results. Therefore, the concentration ratios of the elements are good geochemical signatures of marine inundation for identifying the 2004 Indian Ocean tsunami soil samples in Aceh Province, Indonesia. **(Author's abatract)**

Keywords: *2004 Indian ocean tsunami, Tsunami-stricken soil, Surface morphology, Geochemical signature, Elemental concentration ratio, Engineering*

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2023 February,
(Filipiniana Analytics)
NP

0188

Nickel Electrodeposition Using Deep Eutectic Solvent-based Electrolyte

dela PeÃ±a, Eden

While nickel (Ni) electroplating has been successfully performed using ionic liquids in the past, few studies have reported on the trench-filling characteristics of this process useful for electroforming Ni. This study aimed to deposit and characterize the electrodeposited nickel using an ethaline-based nickel-plating bath with and without ethylenediamine (en). The conductivity of the plating bath was improved, while viscosity was slightly reduced upon the addition of en. Cyclic and linear sweep voltammetry revealed that en acted as a suppressor, significantly reducing the bath's plating rate. The Hull cell was used to determine the optimum operating current density for each bath. The additive-bearing bath produced more compact deposits, better deposit grain morphology, and improved trench-filling (> 95% filling) characteristics compared to its additive-free counterpart. The enhanced super-filling characteristics may be explained by the differential acceleration curvature-enhanced accumulation acceleration (CEAC) model. SEM analysis showed that the deposits possessed a particulate or nodular structure, whereas EDS confirmed the presence of Ni in the deposit. The Ni deposited using the bath without additives had larger particulate grains than those using the additive-bearing bath. Higher Ni amounts were obtained in the additive-laden bath. The use of additives is a promising approach for improving the super-filling characteristics of ionic liquid plating baths. **(Author's abstract)**

Keywords: *Choline chloride, Deep eutectic solvent, Ionic liquid plating, Nickel, Plating additives, Engineering*

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2023 April,
(Filipiniana Analytics)
NP

0189

Optimization Model of Supply Chain Network Design for Small-scale Banana Flour Production Using Deterministic and Metaheuristic Approach

Rallos, Mariah Dora G. , Fordan, Yllyssa C. , Gamot, Ritchie Mae T. , Mata, May Anne E. , Ligue, Kim Dianne B. , Oguis, Giovanna Fae R., Digal, Larr

Problems concerning low-profit-generating production occur in many small producer enterprises, including banana flour production by small-scale Cavendish banana farmers. One usual difficulty is the inability of these small producers to adjust to market conditions due to limited resources. These farmers are unable to allocate adequate resources such as transport vehicles, equipment, and laborers to various activities in the production process. This paper formulated a mixed-integer linear programming model based on a supply chain network design for banana flour production. This model aimed to determine the optimal number of resources for a producer organization to maximize its total profit. The deterministic branch-and-bound technique and metaheuristic binary firefly algorithm were implemented to obtain the model solution. Based on a case study, both approaches consistently showed that to maximize the profit for small-scale banana flour production, they must operate one mill and one truck with a 4,000-kg maximum capacity and hire nine non-regular and 14 regular laborers. The

methodology developed in this study can also be applied to other banana producer organizations with a similar supply chain network to explore alternative enterprises and improve profitability. **(Author's abstract)**

Keywords: *Banana flour production, Binary firefly algorithm, Branch-and-bound technique,, Optimization, Resource allocation, Supply chain network design, Engineering*

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2022 October,
(Filipiniana Analytics)
NP

0190

Pretreatment Optimization of Corn Stover with Subsequent Enzymatic Hydrolysis for Polyhydroxybutyrate (PHB) Production

Nayve, Jr., Fidel Rey P. , Capunitan, Jewel A. , Requiso, Princess J. , Alfafara, Catalino G. , Perez, Nika Anna D., Ventura, Jey-R

Polyhydroxybutyrate (PHB) is considered a potential substitute for conventional, non-biodegradable petroleum-based plastics. However, high production cost has been a major drawback to the commercialization of PHB. The use of low-cost lignocellulosic agricultural residues such as corn stover, together with an effective pretreatment method, can reduce production costs. In this study, optimization of pretreatment methods for corn stover – namely, steam explosion and sequential steam explosion–dilute acid pretreatment – was done to maximize the concentration of reducing sugars in the hydrolysate obtained after enzymatic saccharification. Response surface methodology (RSM)-designed experiments showed that steam explosion temperature had the highest impact on reducing sugar production for both pretreatment methods. Optimum conditions for steam explosion pretreatment were 220.9 °C steam explosion temperature and 11.2 min residence time, yielding a hydrolysate with 9.67 g/L (64.50% yield) of reducing sugars after saccharification. For the sequential pretreatment, 9.14 g/L of reducing sugars (60.93% yield) was produced from the optimum conditions of 224.8 °C steam explosion temperature, 144.2 °C dilute acid temperature, 43.8 min reaction time, and 5% w/v acid concentration. Dilute acid pretreatment significantly decreased the reducing sugar yield after the steam explosion by 5.5%, probably due to the degradation of reducing sugars, making steam explosion sufficient in the pretreatment of corn stover. More importantly, PHB was produced using the hydrolysate from steam-exploded corn stover, with a maximum concentration of 1.81 g/L after 24 h of bacterial fermentation. Therefore, the steam explosion was proven effective in producing sugar-rich hydrolysates from corn stover for PHB production. **(Author's abstract)**

Keywords: *Agricultural residues, Dilute acid pretreatment, Enzymatic saccharification, Polyhydroxyalkanoates, Response surface methodology, Steam explosion, Engineering*

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0191

Response Surface Methodology and Artificial Neural Network Optimization and Modeling of the Saccharification and Fermentation Conditions of the Polyhydroxybutyrate from Corn Stover

Nayve, Jr., Fidel Rey P. , Capunitan, Jewel A. , Alfafara, Catalino G. , Requiso, Princess J. , Tantoco, Chester Jules A., Ventura, Jey-

In this study, a response surface methodology (RSM) and artificial neural network (ANN) were used for the modeling and optimization of the enzymatic hydrolysis and fermentation conditions of the polyhydroxybutyrate (PHB) production from pretreated corn stover. Using three factors in each process, a face-centered central composite Design (FCD) was employed to optimize the reducing sugar yield (RSY), biomass, and PHB production of the saccharification and fermentation, respectively. The optimal conditions (RSY of 0.539 g/g) for enzymatic saccharification were 9.776% w/v solids loading, 83.656 FPU/g enzyme loading, and 18 h saccharification time. It was found that solids loading had the greatest impact on RSY. On the other hand, the optimum fermentation medium conditions were 19.727 g/g C/N ratio, 18.421 g/g C/P ratio, and 9.623 mL of trace elements solution (TES) per liter of fermentation medium, with a maximum PHB concentration of 7.083 g/L. During the fermentation of corn stover hydrolysate medium, the C/N ratio positively affected the growth and the PHB productivity of the microorganism. Moreover, the reliability of the RSM and ANN methods in modeling and predicting the RSY, biomass, and PHB concentrations were compared. The ANN showed higher accuracy compared to the RSM models. This study proved that the microorganism could synthesize PHB under optimal fermentation conditions using the reducing sugars from the enzymatic saccharification of pretreated corn stover. **(Author's abstract)**

Keywords: *Agricultural residues, Biodegradable plastic, Hydrolysate, Polyhydroxyalkanoate, Steam explosion, Engineering*

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0192

Technical Assessment and Policy Analysis of Bio-Oil Production From Rice Straw

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Pyrolysis of rice straw using a fixed bed-batch reactor was investigated to determine the effects of varying pyrolysis temperature (300oC, 400oC, and 500oC) and heating rate (low (0.2- 2.0oC min-1), high (2.6-7.2 oC 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. **(Author's abstract)**

Keywords: *Bio-oil, Policy analysis, Pyrolysis, Rice straw, SBCA, Engineering*

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ENVIRONMENTAL SCIENCE

0193

Assessing Community Participation in Coastal Resource Management in Lupon, Davao Oriental, Philippines

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Community participation ensures the sustainability and success of coastal resource management (CRM) efforts. Despite this recognition, there are limited studies that assessed the factors affecting participation in CRM. There is also a need to strengthen the policies as community participation alone is insufficient. This study examined the potential participation of a coastal community in local coastal habitat restoration and coastal management efforts. Specifically, it determined the sociodemographic profile of the coastal communities, policies affecting the use of coastal resources, community perception and awareness of the policies, factors affecting participation in CRM initiatives, and strategies to protect coastal resources. Primary data were gathered through household interviews (N = 94), whereas secondary data were gathered through government agencies, online reports, and journal articles. Binary logistic regression was employed to determine the factors affecting willingness to participate. Findings revealed that there was general community awareness of regulations and positive views towards participating in CRM initiatives. Results further showed that socio-demographics, boat ownership, perceived effectivity of regulations, local government unit as a source of information, and awareness and previous participation in CRM efforts were the important predictors of participation in CRM efforts. These findings may provide strategic insights into planning and implementing more effective initiatives that promote the protection of coastal and marine resources and sustainable livelihood of the coastal resource users. **(Author's abstract)**

Keywords: *Binary logistic regression, Coastal marine environment, Coastal resource management, Community awareness, Community participation, Fishery regulations, Environmental science*

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0194

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

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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). **(Author's abstract)**

Keywords: *Direct seeded rice, Energy bill, Energy hotspot, System of rice intesification, Transplanted rice, Environmental science*

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0195

Estimating Sediment Export and Retention Capacity of Existing Land Cover in Balanac and Sta. Cruz Watersheds, Philippines Using InVEST-SDR Model

Ureta, Joan U. , Sapugay, Annadel F. , Anastacio, Nico Jayson C. , Trespalacio, Gemmalyn M. , Ureta, J

Identifying priority areas for conservation remains a challenge since ecosystem-based models are typically data extensive. As a response to this challenge, InVEST (Integrated Valuation of Ecosystem Services and Tradeoffs) was developed to map diverse types of ecosystem services (ES). Although InVEST has been widely used in other countries, its application within the Philippines has been limited. This study offers an application of InVEST in the Philippine context. We estimated the amount of sediments exported to the streams and retained in the area by land cover type within the Balanac and Sta. Cruz watersheds. Results showed that in terms of best ecosystem service provision per hectare, vegetated areas – particularly forest land – provide the most sediment retention capacity and the least sediment export. On the other hand, the non-vegetated areas – particularly the built-up areas – provide the least sediment retention capacity and the most sediment export. These results suggest that major strategic water quality management and ES changes should be considered when converting land from one land cover type to another. Furthermore, a considerable opportunity for ecosystem service improvement to water quality through soil conservation and sustainable farming practices can be implemented in cropland areas. Since the majority of the land in both watersheds are cropland, its contribution in sediment transfers is significant, hence its role to managing soil health is of utmost importance. The findings of this study could contribute to the advancement of ES modeling in the Philippines to support land development planning and policy decisions at the national and local levels. **(Author's abstract)**

Keywords: *Ecosystem services, InVEST, Land cover, Sediment export, Sediment retention, Watershed, Environmental science*

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0196

Estimating the Recreational Value and Setting Entrance Fees during Early Development of Ecotourism Sites: the Case of Bataan Natural Park

Diona, II, Dan Leo Z. , de Luna, Catherine C. , Predo, Canesio D. , Sajise, Asa Jose U. , Fajardo, Arielle R., Pulhin, Juan

Ecotourism sites are established to provide “sustainable tourism,” bring economic opportunities to the local communities, and can potentially augment funding for conserving protected areas by charging entrance fees. A dilemma, however, faced by managers during the early stages of the development of ecotourism sites is the uncertain effect of increasing entrance fees on demand. This creates an apprehension to use entrance fees as a sustainable financing mechanism for conservation. This study used a combination of revealed and stated preference approaches to provide information on the recreational benefits and empirical guidance in setting entrance fee surcharges for proposed improvements in two eco-tourism sites of Bataan Natural Park – specifically, Ambon-Ambon and Lumutan Eco-trail and Tala River. Count data regression models were used to estimate the consumer surplus of visitors for the current conditions. In contrast, the contingent behavior method was used to measure the visitors’ willingness to pay (WTP) for improvements in the site attributes. Results of the count data models indicate the total consumer surplus from the ecotourism sites in their current state is significantly higher than the site's cost of improvement and maintenance. Furthermore, tourists are willing to pay more than the currently charged entrance fees. Protest and uncertainty corrected mean WTP for the improved condition are approximately PHP 130.90 for a visit to the eco-trail and PHP 108.50 for a visit to the river. The optimal and revenue-increasing entrance surcharge is estimated to be within PHP 15–76 for the Tala River and PHP 15–114 for the Falls. The results may have implications on providing alternative financing for protecting and conserving other natural parks and protected areas in their early stages of development in the Philippines. **(Author's abstract)**

Keywords: *Bataan Natural Park, Contingent behavior, Count data, Negative binomial regression with endogenous stratification, Travel cost, Truncated Poisson regression, Environmental science*

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0197

Plant and Other Forest Bioresource Utilization by Local Communities of Northern Negros Natural Park, Negros Island, Philippines

Buot, Jr., Inocencio E. , Dechimo, Jr., Ara

Ethnobotanical data, a vital component of a thorough examination of a protected area that aids in planning for management efforts and strategies for biodiversity conservation, is rarely employed because of its rarity or absence in Northern Negros Natural Park’s (NNNP) database. This study aims to [1] determine the plant and other forest bioresource utilization of the local communities in NNNP, [2] assess the threats to the park and its biodiversity due to the utilization of bioresources, and [3] evaluate the Institutional Management Regime for NNNP. The data was gathered using focus groups, key informant interviews, and household surveys. For the secondary data, information was also accessed from the Office of the Protected Area Superintendent and local government units. One hundred thirteen (113) species are used for food (26%), ornamental (24%), herbal or medicinal value (19%), construction (12%), commercial (9%), charcoal and fuel wood (8%), and craft (3%) based on data collected from 643 families in the 11 cities and municipalities that make up the protected area. Housing construction, settlement, and the production of annual and non-perennial timber crops were all noted as major threats identified in the park. According to the review of the Management Effectiveness Tracking Tool (METT), the “context” and “planning” components were the strengths of the protected area employing the management rating of 64 and 53.8%, respectively. The Republic Act No. 11038, commonly known as the Expanded National Integrated Protected Area System (ENIPAS), is the sole unambiguous law that governs bioresource harvesting in protected areas. In addition, policies imposed by cooperatives and villages were used to control the usage and harvesting of bioresources. These findings gave us a crucial socioeconomic and institutional understanding of the landscape, preparing us to make interventions and create management plans to deal with problems involving the use of bioresources in the protected area. **(Author's abstract)**

Keywords: *Ethnobotany, Institutional assessment, Management effectiveness tracking toll analysis, Northern Negros Natural Park, Protected area, Socioeconomic assessment, Environmental science*

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0198

Willingness to Pay of Domestic Water Users for Improved Conservation of Mt. Banahaw de Lucban Watershed, Quezon, Philippines

Predo, Canesio D. , Camacho, Leni D. , Calderon, Margaret M. , Agudilla, Mary Ann R., Racelis, Diomedes A. , Ancog, Rico

Many ecosystem services (ES) are provided by watersheds to downstream populations at no cost to them. To ensure sustainability, those who benefit from these services should be engaged in the protection and management of the watershed. The Mt. Banahaw de Lucban (MBdL) provides non-market values that are not considered in management planning; thus, the underestimation of its ES adversely affects its provisioning capabilities. Adding to this shortcoming is the insufficiency of funds to sustain the current watershed conservation initiatives. This study assesses the value that domestic water users have for sustained water supply resulting from the improved conservation of the MBdL watershed through contingent valuation. The willingness to pay (WTP) of 500 respondents from Lucban, Pagbilao, and Lucena City was estimated using logit regression to develop the model. Results revealed that 95% of the respondents voted yes to the referendum and that about 65% support the improved watershed conservation program. Bid amounts, years of education, household size, occupation, and income have a significant influence on WTP. The mean WTP estimate is PHP 71.53/household/mo. The approximate present amount of improved MBdL conservation is PHP 21.50M/yr. The net present value is estimated at PHP 76 M for five years. The potential fund, if collected, may contribute to the sustainability of any watershed conservation program for MBdL. **(Author's abstract)**

Keywords: *Contingent valuation, Ecosystem services, Watershed, Willingness to pay, Environmental science*

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FISHERIES

0199

Comparison of Glycogen Content from Three Philippine Mussels

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This study was conducted to measure and compare the glycogen content in three Philippine mussels of the family Mytilidae – *Perna viridis, Mytella strigata,* and *Modiolus philippinarum. P. viridis, M. strigata,* and *M. philippinarum* were collected from the provinces of Samar, Cavite, and Iloilo, respectively. *P. viridis,* locally known as "tahong," is cultured in the Philippines. *M. strigata*, known as "charru" or black mussel, has a distinct brown to black shell coloration that varies with age and is currently considered as an invasive species in the Philippines. Lastly, *M. philippinarum* mostly inhabits intertidal mudflats, that form extensive aggregates. These mussels are edible and are a well-known cheap source of animal protein. Extraction of glycogen involved mussel meat preparation, the addition of hydrolyzing agents, and precipitation. Results showed glycogen content varies in different species from 5.5–3.0% yield. This study is a contribution to the lack of recorded biological information regarding Philippine mussels in terms of biochemical content such as glycogen. This information can later be used to assess the mussels' health, biological, and habitat ecological status. **(Author's abstract)**

Keywords: *Extraction, Glycogen, Modiolus philippinarum, Mytella strigata, Perna viridis, Fisheries*

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0200

Genetic Diversity and Structure of Dominant Seagrass Species in the Southern Philippines for Conservation and Adaptive Management

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This study is the first largeâ€• scale genetic population study of the three dominant tropical species of seagrass in the southern Philippines. The aim was to understand the genetic diversity, population structure, and clonality of *Enhalus acoroides, Thalassia hemprichii,* and *Cymodocea rotundata* for appropriate ecosystem management and conservation. Population genetics analysis for the 15 sites was performed by using polymorphic microsatellite markers within the regional geographical scale. The results showed that the population genetic parameters across the Mindanao region are low to high. Overall, Clonal richness was highest in *E. acoroides*, followed by *T. hemprichii* and *C. rotundata*, indicating sexual reproduction is prevalent. The largest genet found in the study was at Rizal, Northern Mindanao, wherein throughout the sampling area only one genet was identified. The mean FIS (coefficient of local inbreeding) values were positive (heterozygous deficit) with some sites deviating from Hardy-Weinberg equilibrium. Significant pairwise population genetic differentiation was found among many sites. Isolation by distance (IBD) was detected in *T. hemprichii* and *C. rotundata* ($P < 0.05$) but not in *E. acoroides* ($P = 0.253$). IBD is present among populations, maybe influenced by the ocean current system in the southern Philippines, but it has to be confirmed yet in the future study. If the goal is to maintain the genetic connectivity of these ecologically important seagrass species, conservation planning and implementation of marine protection should be considered at the regional scale – following the Mindanao Ocean currents. **(Author's abstract)**

Keywords: *Anthropogenic, Currents, Diversity, Microsatellite, Seagrass, Fisheries*

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0201

Identifying the Suitable Integrated Multi-trophic Aquaculture (IMTA) Species Combination for *Penaeus monodon* (Fabricius, 1798) for a Sustainable Pond Aquaculture

BesoÃ±a, Jomar F. , Eballe, Rustan C. , Navarro, Victor R. , Tering, Jay D. , Pinaso, Jr., Romeo D. , dela PeÃ±a, Mark A. , Arriesgado, Elgen M., Arriesgado, Da

The environmental problem caused by aquaculture contributes to poor production of the giant tiger shrimp (*Penaeus monodon*) globally and locally. Integrated multi-trophic aquaculture (IMTA) lessens aquaculture environmental impacts through the addition of species in the system that could efficiently utilize inorganic and organic waste naturally. IMTA technique was designed to identify which among the species combination is suitable for *Penaeus monodon* IMTA pond culture. Four (4) treatment combinations from different trophic levels were evaluated for their suitability as IMTA species combinations in two areas: Mukas, Kolambugan, Lanao del Norte [with *Penaeus monodon, Siganus guttatus, Ulva fasciata*, and *Perna viridis* (M1); *P. monodon, S. guttatus,*

Gracilaria verrucosa, and *P. viridis* (M2); *P. monodon, C. chanos, Ulva fasciata*, and *Modiolus modulaides* (M3); and *P. monodon, C. chanos, G. verrucosa*, and *M. modulaides* (M4)] and in Naawan, Misamis Oriental [with *P. monodon, S. guttatus, U. fasciata,* and *P. viridis* (N1); *P. monodon, S. guttatus, G. verrucosa, P. viridis* (N2), *P. monodon, C. chanos, U. fasciata*, and *P. viridis* (N3); and *P. monodon, C. chanos, G. verrucosa*, and *P. viridis* (N4)]. All treatments showed non-significant growth of *P. monodon* at 2.66–3.21% d^{-1} (M1, M2, M3, and M4) and 0.09–0.17% d^{-1} (N1, N2, N3, and N4). The survival rate of *P. monodon* in N1 (32.59 ± 4.73%) and N2 (30.27 ± 2.51%) showed a highly significant difference as compared to N3 (24.08 ± 4.25%) and N4 (21.95 ± 4.76%). Treatments M3, M4, N3, and N4 generated the highest economic return of USD 101.83–237.58 compared to treatments M1, M2, N1, and N2. All water parameters are within the optimum for the growth and survival of the IMTA organisms. The results revealed that a combination of *C. chanos* with either of the seaweeds and mussels (M3, M4, N3, and N4) is suitable for IMTA pond culture for *P. monodon*. **(Author's abstract)**

Keywords: *Chanos chanos, Mukas, Naawan, Siganus guttatus, Sustainability, Fisheries*

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0202

Market Fish Resources in Magallanes, Sorsogon, Philippines

Malto, Mark Ariel D., Dumilag, Richard

Since the 1930s, a number of fish taxa have been recorded from the marine waters of Magallanes in Sorsogon, Philippines. However, it has only in 1995 that the checklist was properly updated, in which the number of recorded species plummeted but has yet to reach a plateau. While the actual field surveys on natural habitats are a common approach to obtaining fish records, market surveys are also proven equally aidful. Here, we present an updated checklist of all named species of fish vended in Magallanes markets – including their local name, origin, and temporal availability. Sourced from Sorsogon Bay and Ticao-Burias Pass, a total of 77 species were identified. Thirteen species set new records for Sorsogon Bay. The Ticao-Burias Pass was the exclusive source of 11 taxa. A total of 61 species were sourced from either site. The current list of marketed fish from Magallanes represents 20% with that of the entire fish records reported from Sorsogon Bay. The fish species composition varied both in terms of origin and seasonal availability. Comparison of the present list of commercial fish in Magallanes against other records elsewhere in the Philippines may not be possible at the present, as previous studies indicated different sampling efforts, wider area coverage, and longer cumulative observation period. Return efforts and further market survey studies are expected to augment the current number of recorded fish taxa. Our present study makes recommendations for the continued use of market surveys to help update and verify records of fish diversity in a given area. **(Author's abstract)**

Keywords: *Commercial fish, Fish distribution, Fish seasonality, Sorsogon Bay, Ticao-Burias Pass, Fisheries*

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0203

Potential Participation of Fisherfolks in Tourism Activities in Samal Island, Mindanao, Philippines

Gomez, Aurelia Luzviminda V. , Aguinaldo, Roxa

Small-scale fishers belong to the most vulnerable communities in developing countries. In the Philippines, small-scale fishers are among those with the highest poverty incidence. In Davao Region, the livelihoods of small-scale fishers can be seriously affected by constraints in fish catch, impacts of climate change, as well as the implementation of closed season ordinance. With this background, this study explores the potential of tourism on Samal Island as a source of supplemental income for fisherfolks. Specifically, this study aims to identify the factors that affect the willingness of fisherfolks to engage in tourism-related activities. Descriptive analysis and logit regression were utilized to analyze the data gathered from 100 fisherfolks. Results show that the majority of the respondents are willing to participate in tourism-related activities. Married fisherfolks and those with higher household incomes are more likely to participate in tourism-related activities. These results present opportunities for the tourism industry to employ workers from the fisheries sector. Results also reveal that participation in tourism-related activities is seen by fisherfolks as a potential source of supplemental income rather than a source of alternative income. Fisherfolks who are not willing to participate in tourism activities lack experience and interest in tourism, being used to fishing as the only source of livelihood, or have other sources of income. The local government unit is recommended to assess the training needs of fisherfolks and capacitate them to engage in tourism-related activities. This research provides significant findings from the perspective of the fisherfolks. Future studies can consider assessing community participation in general, which includes women, household members, and other community members. It is also recommended to conduct a study from the perspective of business owners in the tourism industry. **(Author's abstract)**

Keywords: *Fisherfolks, Samal Island, Supplemental income, Tourism, Willingness to participate, Fisheries*

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0204

Raft and Longline Culture of Green Mussel, *Perna viridis*, in Cañas Bay, Iloilo, Philippines

MoleÃ±o, John Ray N. , Mediodia, Dominique P., Baylon, Carlo

Grow-out methods like the raft and longline have been utilized by various countries in growing green mussel, *Perna viridis*. In the Philippines, the stake method using bamboo poles is still widely used, which is believed to cause siltation that negatively affects green mussel production. In this study, the feasibility of raft and longline methods was determined based on mussel growth and the condition index (CI). Environmental conditions in Cañas Bay, Iloilo were also presented. Results showed that there was no significant difference in mussel growth except for final weight, where mussels in the raft were found to be significantly heavier than those in the longline. Meanwhile, the CI of mussels did not significantly differ between the two methods. Physico-chemical parameters of the water in Cañas Bay were found to be suitable for growing green mussels. Phytoplankton was composed of diatoms (86%), dinoflagellates (6%), green algae (5%), and blue-green algae (3%). This study showed the feasibility of using suspended methods like raft and longline in areas where environmental conditions favor mussel growth. **(Author's abstract)**

Keywords: *Aquaculture management, Condition index, Mussel culture, Suspended method, Fisheries*

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FOOD SCIENCE AND TECHNOLOGY

0205

Development of a Water Kefir Beverage Made From Jackfruit Processing By-product and Its Potential Probiotic Property

Pablo, Anne Gellie P., Cimafranca, Lynette

Water kefir is a fermented probiotic drink produced by the fermentation of dried sugary fruits and sugar using water kefir grains. It is characterized by its fizzy and slightly acidic and alcoholic taste. Instead of using fresh or dried fruits and sugar as raw materials in fermentation, this study aims to explore the utilization of jackfruit concentrate, a by-product of dehydrated jackfruit production. The beverage formulation was performed through a 3 x 3 factorial design with independent variables: jackfruit concentrate (25–75%v/v) and kefir grains (5–15%w/v) levels. Through response surface methodology (RSM), the kefir fermented jackfruit beverage (JFB) formulation was optimized with 75%v/v jackfruit concentrate and 9.7475%w/v kefir grains that could give optimal values of product acceptability score of 7 in the nine-point Hedonic scale, total soluble solids (TSS) of 10.0019, and pH of 4.2864. Regression analysis shows it cannot predict the microbial count of the product; however, the microbial viabilities of all the treatments range from 7.55 x 10^6 to 3.44 x 10^7 CFU/mL, which suggests that the formulated beverage has a good probiotic potential. Acceptability studies also suggest that the product has good market acceptability in terms color, aroma, taste, mouthfeel, and general acceptability. **(Author's abstract)**

Keywords: *By-product processing, Fermentation, Jackfruit, Lactic acid bacteria (LAB), Probiotic, Water kefir, Food science and technology*

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0206

Food Safety of Thailand's Pineapples, Bananas, and Dragon Fruits from Pesticide Contamination: A Study Using GC-MS Analysis

Soikham, Saowalak , Saenserm, Phumrapee , Buddhaprom, Jaruwat , Kuaykaimuk, Kansuda , Wanwimolruk, Sompon , Wanwimolruk, Chon

Pesticides are used extensively in agriculture, raising issues about food safety. Currently, consumers are notably concerned by pesticide contamination when eating fruits and vegetables. Food safety information on certain produce is important to encourage consumers to eat more fruits and vegetables. This study's purpose was to determine whether three commonly consumed Thai fruits – pineapple, banana, and dragon fruit – are safe to eat. The effectiveness of peeling as a method to remove pesticide residues was also investigated. The monitoring of pesticide residues for these three fruits purchased from markets in Thailand was done by determining the pesticide contents of collected fruit samples by GC-MS analysis. The detection rate of pesticide residues was very high at 96% in both the pineapple and dragon fruit samples studied. On the other hand, the detection rate of pesticide residues in the banana samples was more moderate at 26%. The number of samples that were found to have residues that exceeded the maximum residue limits (MRL) was also considerably high. In the case of the pineapple and dragon fruit samples, 96 and 70% of them had residues that exceeded the MRL respectively. Only 9% of the banana samples had pesticide residues that exceeded the MRL. These findings indicate that the extent of pesticide contamination in pineapples and dragon fruits is greater than that observed in the banana samples. After the process of peeling, the pesticide residues were significantly reduced in all three fruits. This suggests the pesticide residues reside mostly in the peel of pineapple, banana, and dragon fruit. Therefore, in practice, it is safe to eat pineapple, banana, and dragon fruit in Thailand because these fruits are always served without their peel. **(Author's abstract)**

Keywords: *Banana, Dragon fruit, Food safety, Pesticide residues, Pineapple, Food science and technology*

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0207

Modified Atmosphere Packaging and Low Temperature Storage of Red-Fleshed Dragon Fruit (*Hylocereus polyrhizus* (Weber) Britton & Rose)

Franco, Rona Kay G. , Esguerra, Elda B. , Castro, Ang

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. **(Author's abstract)**

Keywords: *Dragon fruit, Low temperature storage, Modified atmosphere packaging, Food science and technology*

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2020 April,
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0208

Optimization of Spray-drying Conditions for the Development of Fermented Shrimp Powder Using Response Surface Methodology

VillaseÃ±or, Ma. Dolor L. , Tila, Christine Ann S. , Lacasandile, Virjo-Anne L. , Barcelon, Jr., Dan

Fermented shrimp is a widely used condiment and flavor additive in various local dishes and dips for boiled vegetable products, especially in East and Southeast Asia. Spray-drying of this product offers advantages in ease of transport and storage and may prolong the shelf-life versus traditional packaging in bottles. The study aimed to optimize the spray-drying operating conditions for developing a fermented shrimp powder with acceptable quality using response surface methodology (RSM) with central composite design (CCD). The study identified the dilution ratio of 1:1 to 1:4 of the fermented shrimp-to-water solution to extract the maximum flavor from the fermented shrimp before the spray-drying process. The effects of the independent variables: inlet temperature (140–180 °C) and feed flow rate (15–35 mL/min) on the response variables: percent yield (%), moisture content (%), and water activity (a_w) were studied for the production of spray-dried powder with acceptable quality and maximum flavor of fermented shrimp. Verification experiments were conducted to validate the accuracy of the predictive models. Results showed the optimum operating conditions to produce spray-dried fermented shrimp

powders were at an inlet temperature of 180 °C and a feed flow rate of 21.26 mL/min. At optimum spray-drying conditions, the predicted powder yield was 27.77 ± 2.75%, moisture content was 3.84 ± 0.29%, and the water activity was 0.347 ± 0.010. The quadratic models showed that all independent variables have significant ($p < 0.05$) effects on the response variables. The coefficients of the quadratic model for all combinations of the inlet temperature and feed flow rate have significant ($p < 0.05$) effects on the percent yield, moisture content, and water activity, as illustrated in the 3D surface and contour plots. The quadratic models predicted the responses, which indicates the suitability of the model for the development of spray-dried fermented shrimp powders with acceptable quality properties. The findings of the study have imparted a valuable understanding of the effects of inlet temperature and feed flow rate on the quality characteristics of the spray-dried fermented shrimp powder. This information will assist the fishery products industry in utilizing the fermented shrimp for powder production, which could help in ease of transport, storage, handling, and prolonging of shelf life compared to the traditional bottled liquid fermented shrimp samples. **(Author's abstract)**

Keywords: *Spray-drying, RSM, Powder, Fermented shrimp, Bagoong alamang, Food science and technology*

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0209

Phytochemical Analysis and Antibacterial Potential of Tabon-tabon (*Atuna racemosa* Raf) Fruit Extract against E. Coli BIOTECH 1634

Barrion, Aimee Sheree A. , Israel, Katherine Ann C. , Mopera, Lotis E. , Tila, Christine

This study aimed to examine the phytochemical levels of crude "tabon-tabon" (*Atuna racemosa* Raf.) fruit extracts subjected to air-drying, oven-drying, and freeze-drying. It also sought to validate the claims of previous literature on the fruit's antimicrobial properties by using its aqueous extracts as an antibacterial wash for green ice leaf lettuce. Phytochemical analysis revealed significantly higher ($p < 0.05$) levels of alkaloids and tannins compared to coumarins, saponins, and terpenoids. The highest alkaloid content (16.25 ± 1%) was obtained using oven-drying, whereas the highest tannin content was obtained using freeze-drying (14.14 ± 1.13%). *In vivo* antibacterial assay against *Escherichia coli* was performed to test the aqueous extracts alongside 200 ppm chlorine solution and water for comparison. Artificially-inoculated lettuce samples were individually soaked in 15-mL solution at 2- and 5-min contact times. Bacterial load was determined at a 2-d interval for a period of 8 d. Results of the microbiological analysis showed no significant interaction in the soaking time used. However, the treatments were independently found to have significant effects on Days 0, 4, and 6. The highest antibacterial effect in green ice lettuce was exhibited up to Day 6. **(Author's abstract)**

Keywords: *Alkaloids, Antibacterial, Atuna racemosa, Phytochemicals, Tabon-tabon, Food science and technology*

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0210

Risk Profiling of Aflatoxin in Peanut (*Arachis hypogaea* L.) to the Filipino Consuming Population

Capanzana, Mario V. , Limon, Mark R. , Villarino, Casiana Blanca J. , Barrios, Erniel B. , Mahoney, Deon , Bautista, Karina Angela D. , Mariano, Christine Bernadette D.G. , Rustia, Abig

Aflatoxin (AFL) is a naturally occurring mycotoxin produced by *Aspergillus* spp. and is commonly associated with peanuts (*Arachis hypogaea* L.), a major field legume in the Philippines. The major types of AFL are B1, B2, G1, and G2 – comprising the total aflatoxin (AFT). AFL exposure has been shown to cause both chronic and acute toxicity, with the liver as the main target organ. It is considered genotoxic and carcinogenic. The objective of this study is to establish the profile of the potential risks associated with the consumption of peanuts contaminated with aflatoxin to the Filipino consuming population. The study included [1] determination of data gaps in the risk profiling of AFL in the consumption of peanuts by the Filipino peanut-consuming population; [2] hazard identification and characterization; [3] estimation of dietary exposure (DE) and risk-based on uncertainties, variabilities, and assumptions; and [4] consolidation of available control measures and possible mitigation protocols for AFL in peanut. AFL was detected in 92% of all the peanut samples (n = 50) analyzed, with overall mean levels of 802.83 µg/kg AFT, 683.53 µg/kg AFB1, and 119.30 µg/kg AFB2 exceeding the maximum level (ML) of 15 µg/kg set by the Codex Alimentarius Commission for AFT. Considering the assumptions made and data gathered in this study, the estimated daily intakes (EDIs) of the Filipino adult (20–59 yr old) consuming population to AFT and to AFB1 in peanut – at 97.5th percentile consumption – were 1.22–6,527.18 ng/kg body weight (bw)/d and 1.22–5,574.90 ng/kg bw/d, respectively, which exceeded the recommended provisional maximum tolerable daily intake (PMTDI) of 1 ng/kg bw/d. The margins of exposure (MOE) were also generally estimated to be below 10,000, which indicates that it is a potential health concern and that it supports the need for further risk management actions. **(Author's abstract)**

Keywords: *Aflatoxin, Peanut, Philippines, Risk, Risk profile, Food science and technology*

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0211

Risk Profiling of Beta-agonists in the Consumption of Pork by the Filipino Consuming Population

Loria, Jasmin A. , Dimaya, Danica Angeline P. , Villarino, Casiana Blanca J. , Nones, January M. , Barrios, Erniel B. , Mahoney, Deon , Bautista, Karina Angela D. , Magtibay, Francis Philip S. , Tan, Mariel Adie P. , Rustia, Abigail S., Capanzana, Mario

Beta-agonists (β-agonists) are feed additives used in animal production (20–40 d before slaughter) to simultaneously reduce fat gain and increase the muscle mass of animals, but the residues may remain in the tissues of animals if the withdrawal period is not observed. This is a concern due to the potential adverse health effects to humans symptomized by increased heart rate, palpitations, vasodilation, and reflex tachycardia. This study described the potential risks associated with the consumption of pork with β-agonists to the Filipino pork-consuming population through the risk profiling process. Specifically, it consolidated the available information and determined the data gaps relevant to the risk profiling process, including available risk management options for β-agonist residues in pork. The study identified and characterized β-agonist as the hazard and pork as the concerned commodity. The risk was estimated through the evaluation of β-agonist residue concentrations in pork kidneys and pork meat from the National Veterinary Drug Residue Monitoring Program of the Philippine National Meat Inspection Service and the pork consumption data of the adult Filipino consuming population from the Department of Science and Technology–Food and Nutrition Research Institute in consideration of identified uncertainties, variabilities, and assumptions. The mean and maximum dietary exposures of the adult Filipino consuming population, with an assumed average body weight of Asian adults, to β-agonists in pork meat (0.0111 and 0.1478 µg/kg bw) and pork kidney (0.0166 and 0.4847 µg/kg bw) were estimated to exceed 100% of the acceptable daily intake of clenbuterol (0–0.004 µg/kg bw). These results indicate that there is an appreciable risk to the health of the Filipino population when it comes to the consumption of pork contaminated with β-agonists. **(Author's abstract)**

Keywords: *Beta-agonist, Pork, Dietary exposure, Philippines, Risk profile, Food science and technology*

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0212

Unmasking the Real Effect of Gender of Household Head in Household Food Security in the Philippines

Villanueva, Jessica D. , Guirindola, Mildred O., Custodio, Jr., Carlo G. , Guirindola, Ruel

The United Nations (UN) presented the 17 Sustainable Development Goals (SDGs) to be achieved by 2030 (UN 2016), and goal number two of the SDG is to end hunger and achieve food security and goal five is gender equality. The study assessed the effect of household headship on food security in the Philippines and identify significant factors and assess the gaps. The household food insecurity access scale (HFIAS) was used to evaluate household food security (n = 13,672), which was cross-examined with the households' socio-demographic and health and sanitation characteristics using descriptive and binary logistic regression analyses. From the survey, most of the households are headed by a male (84%), and only around 26% are food secure. Initially, the female-headed household had a 1.34 times higher likelihood of food security than the male-headed household, but upon considering the confounding effect and possible effect measure modification of other risk factors, male-headed households had 20% higher odds of food security. The study revealed that there was an overestimation of the magnitude of the association between food security and the gender of the household head if the confounders were not controlled. Confounding parameters that affected this result are occupation, type of cooking fuel, and type of flooring material. The gender-based gaps are mostly connected to employment; implicitly embedded are culture and income. This study adds to the body of knowledge on how the gender of the household head affects household food security as an empirical basis to refine government household food security interventions and maximize their impacts. **(Author's abstract)**

Keywords: *Food security, Gender, Household head, Sustainable Development Goals, The Philippines, Food science and technology*

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FORESTRY

0213

Development of a Climate Responsiveness Framework for the Philippines' Environment and Natural Resources Management Sector

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The Philippines' vulnerability to climate change necessitates the adoption of strategies to strengthen the most vulnerable sectors and diminish severe climate change impacts in the future. This study assessed the implications of recent findings of climate change science on the country's Department of Environment and Natural Resources (DENR) 10 priority programs through a landscape and ecosystem-based approach. The assessment was done by defining the impacts of climate change on natural ecosystems through a comprehensive review of relevant literature at the global to national scale, as well as the development of a framework for assessing the climate responsiveness of programs. Using a set of 12 criteria for climate responsiveness and a four-point rating scale

(0/none to 3/high), the programs were assessed through a literature and document review, conduct of a series of workshops, and interviews and self-rating surveys with key actors, such as officers of the divisions and attached agencies of DENR. Results of the assessment showed that most of DENR's programs were found to have low ratings in terms of flexibility, a long-term scope of impacts, the ability to address interconnected risks and vulnerabilities, the ability to stimulate migration to green development pathways, and the promotion of incremental and transformational adaptation. To improve the ratings, it is recommended that decision support systems be developed, and plans and programs be integrated and harmonized through multi-agency/multi-stakeholder collaboration and a robust system for developing climate-responsive policies – including the National Land Use Act, Sustainable Forest Management, Payment for Environmental Services, and the Carbon Offset Law. **(Author's abstract)**

Keywords: *Climate change, Climate resilience, Climate responsiveness, Ecosystems-based approach, Forestry*

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0214

Efficacy against Molds and Decay Fungi of Cashew Nut Shell Liquid (CNSL) Formulations Applied on Forest Woody Vines

Alejo, Kennethjer G. , Micosa, Sheryll C. , Pelayo, Shirley A., Omalin, Alain

An organic-based preservative was formulated from cashew nut shell liquid (CNSL) because of its anti-termite and fungicidal properties. Various formulations such as cashew nut shell liquid + ethanol (CNSL + EtOH), cashew nut shell liquid + ethanol + boric acid (CNSL + EtOH + BA), and cashew nut shell liquid + ethanol + copper chloride (CNSL + EtOH + $CuCl_2$) were developed from the refined cashew nut shell liquid. Laboratory evaluation showed that CNSL + EtOH + $CuCl_2$ had the highest inhibition against the decay fungus, *Gloeophyllum sepiarum*, whereas CNSL + EtOH + BA and CNSL + EtOH provided moderate inhibitions. The three formulations, however, only showed slight to moderate inhibition against *Polyporus sanguineus.* The plate test against molds showed varied results. CNSL + EtOH showed no inhibition in both species of molds – *Aspergillus niger* and *Penicillium sp.* – whereas CNSL + EtOH + BA and CNSL + EtOH + $CuCl_2$ showed slight inhibitions against both mold fungi. Results indicate that the three CNSL formulations showed toxicity against fungi, although it is less effective against molds but moderate to effective against decay fungi. The performances of CNSL formulations were tested in forest woody vines. The results of the treatment showed varied retention values. The concentration of CNSL significantly affected the retention. Likewise, the indoor exposure test showed variation in the efficacy of CNSL formulations. After a year of exposure, forest woody vines treated with CNSL + EtOH + $CuCl_2$ proved to be the most effective against fungi. **(Author's abstract)**

Keywords: *CNSL, Forest woody vines, Efficacy, Molds, Decay, Forestry*

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0215

Evaluation of Young Falcata Plus-Trees for Veneer and Plywood Production in the Philippines

Alipon, Marina A. , Gilbero, Dennis M. , Jimenez, Jr., Juan

Young (3-, 5-, and 7-yr-old) falcata [*Falcataria moluccana* (Miq.) Barneby & J W. Grimes] trees were evaluated for their suitability to be processed into veneer and plywood. Three sample trees per age level were harvested from industrial tree plantations in Agusan del Norte and Surigao del Sur, Mindanao, Philippines. A straight portion of each tree from the bottom up to 4.5 m long was cut and divided into three billets at 1.5 m each. These were assigned to be peeled into 0.85-, 2.20-, and 2.80-mm veneer thicknesses. Veneering was done in a spindleless lathe using established lathe settings for falcata billets. Veneer quality per thickness and age level was evaluated based on the frequency and depth of lathe checks (LC). Results showed that LC occurred more frequently in the 2.20-mm-thick veneer, but these were shallower than the 2.80-mm, which had less frequent but deeper LC. On the other hand, age was found to significantly affect the formation of deeper LC in the 3-year-old 0.85-mm thick veneer; thus, it should only be used as a core veneer. The bond strength quality test showed that, regardless of age, falcata plywood passed the glue bond requirement of PNS ISO 12466-2:2016. **(Author's abstract)**

Keywords: *Bond strength, Falcata, Lathe checks, PNS ISO 12466, Spindleless lathe, Veneer quality, Forestry*

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0216

Helicia danlagunzadii (Proteaceae), a New Species from the Mt. Mantalingahan Protected Landscape, Palawan, Philippines

Navidad, John Ryan L. , Eduarte, Gerald T. , Umali, Arthur Glenn A. , Malabrigo, Jr., Pastor L., Tobias, Adriane

A new species, *Helicia danlagunzadii*, from the mossy forest of the Mt. Mantalingahan Protected Landscape (MMPL) in southern Palawan, Philippines is described and illustrated. The new species is distinct from the other known species of *Helicia* in the Philippines because of its ramiflorous flowering, very short inflorescences (less than 4 cm), and yellow color. *Helicia danlagunzadii* is the sixth species of the genus recorded in the Philippines. Following the assessment criteria of IUCN, the species is assessed as Critically Endangered. **(Author's abstract)**

Keywords: *Critically endangered, Endemic, Malesian Flora, Ramiflorous, Short flower, Forestry*

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0217

Influence of Densification Treatment on The Morphology and Density Profile of *Paraserianthes falcataria* Laminas

Albert, Charles Michael, Liew, Kang Chi

Fast-growing wood species have a limited range of applications due to their low density. Despite that, densification technology can be applied to improve its density. In this study, laminas from *Paraserianthes falcataria*, a low-density wood species, were subjected to viscoelastic-thermal compression (VTC), a densification treatment. The objective of this study was to evaluate the impact of different pre-steaming durations in the densification treatment on the cell lumen deformation and density profile of *Paraserianthes falcataria* laminas. The laminas were pre-steamed with different durations ranging from 0–30 min, compressed with heat, and cooled down. For cell lumen area measurement, laminas pre-steamed for 30 min had the lowest cell lumen area, where the decrease in the lumens contributed to an enhancement in density. The finding from the density profile

measurement indicated that densification treatment had enhanced the density of the laminas by up to 50%, whereby laminas pre-steamed for 10 min achieved the highest density. **(Author's abstract)**

Keywords: *Densification, Density profile, Morphology, Paraserianthes falcataria, Viscoelastic-thermal compression, Forestry*

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0218

Recreation Valuation of Caving Using Travel Cost Method in Capisaan Cave System, Nueva Vizcaya, Philippines

Calderon, Margaret M. , Caranza, Jay

The value of recreation services generated by the caving activity in Capisaan Cave System (CCS) in Kasibu Nueva Vizcaya was estimated using the zonal travel cost method, a revealed preference valuation technique. Data were collected through on-site and online visitor surveys with a total of 429 respondents. Regression analysis using the different functional forms of data was explored to estimate the demand function of the site. Results show that transformation of data in their natural log forms gave better linearity between variables, with estimated recreational values of the cave system ranging from PHP 1,703,500–2,098,300/yr and total access value of PHP 8,351,298–8,746,098 based on 2018 visitation data. These estimates provide a measure of the value of benefits derived from the ecotourism services of the CCS. These values need to be communicated to the stakeholders of CCS and its neighboring communities to increase appreciation for its recreation value. They should also be considered in evaluating development and preservation projects intended for the CCS. **(Author's abstract)**

Keywords: *Cave system, Caving, Ecosystem services, Recreational value, Resource valuation, Zonal travel cost, Forestry*

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0219

Utilization Potential of 10 Forest Woody Vines Grown in the Quezon Protected Landscape (QPL), Quezon, Philippines: Physical and Mechanical Properties

Daguinod, Shereyl A. , Marasigan, Oliver S. , Alipon, Marina A. , Bondad, Elv

The physical and mechanical properties of 10 woody vines grown in Quezon, Philippines were determined to assess their suitability for different end-uses such as handles, frames, and weaving materials for various kinds of handicrafts and furniture. The tests were done to compare the properties of the 10 vines species that showed significant differences in physical and mechanical properties. For the physical properties, *alagau-baging (Premna subscandens), hinggiw-puti (Melodinus cumingii),* and *diplay (Rhaphidophora acuminata)* gave the lowest green moisture content (35.87, 39.28, and 79.99%, respectively) and smallest diameter (9.16, 7.93, and 9.64%, respectively) and longitudinal shrinkage (0.66, 1.87, and 1.22%, respectively). However, they also showed the highest relative density (0.47, 0.55, and 0.51, respectively). For mechanical properties, the tensile strength (TS) of *diplay* was significantly higher than other species in split (39.44 MPa) and round (41.78 MPa) forms under green conditions. On the other hand, *kamagsang-pula (Agelaea trinervis)* (56.34 MPa and 41.48 MPa) and *alagau-baging (Premna subscandens)* (32.84 MPa and 48.64 MPa) gave the highest TS in split and round forms at 18%

MC each. For folding endurance (FE), *singkamas-singkamasan (Mucuna reticulata)* and *hinggiw-tigas (Ficus trichocarpa)* had the most folds in split (86 and 83, respectively) and round forms (92 and 98, respectively). The radius of curvature (RC) of *sili-sili (Ampelocissus botryostachys)* (71.54 mm) was the highest and no failure was observed in *diplay (Rhaphidophora acuminata)*. Moreover, the maximum force of the prototype baskets (132.84 kgf) and trays (129.23 kgf) showed higher than baskets from the commercial species studied (51.97 and 95.35 kgf, respectively). Based on the results of the study, the 10 woody vines are suitable and could be used as alternative raw materials for handles, toys, frames, and weaving materials for handicrafts and furniture. **(Author's abstract)**

Keywords: *Forest woody vines, Lianas, Mechanical properties, Physical properties,, Forestry*

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GEOLOGY

0220

Modeling Mineral Scaling in Matalibong Sector of Tiwi Geothermal Field, Albay, Bicol, Philippines

Ejera, Vincejet NinÌfo , Balangue-Tarriela, Maria Ines Rosana , Mejorada, Arnel , Reyes, Hedric

Mineral scaling constitutes a major problem in geothermal fields. It imposes adverse impacts on the performance of the power plant as mineral precipitates and clogs facilities, affecting steam production. This paper identifies the processes leading to the formation of calcite, pyrite, and anhydrite as mineral scales in Well-1 located at the Matalibong sector, one of the production sectors in Tiwi Geothermal Field, Albay, Philippines, using CHIM-XPT (2016). Reconstruction of reservoir water, cooling, adiabatic boiling, fluid-fluid mixing, and isothermal simulations were performed. In addition to established temperature and pressure, fluid flow rate and wellbore geometry (pipe length and wellbore inner diameter) were considered as factors in mineral scale formation. Results of the geochemical modeling showed that the mineral scaling in Well-1 could be a product of adiabatic boiling and cooling of mixed cold spring water and reconstructed reservoir water. Key findings show that at a constant temperature, a boiling event occurs when pressure is reduced due to a lower fluid flow rate with respect to its depth leading to the formation of minerals, specifically anhydrite. Decreasing fluid flow rate also triggers adiabatic boiling. Kinetics can promote adiabatic boiling where pressure changes due to fluid flow rate conditions leading to the formation of mineral scales. With this better understanding of how calcite, pyrite, and anhydrite were formed in Well-1, adiabatic boiling and, thus, the formation of the mineral scales can be avoided or minimized by proper monitoring and control of the fluid flow rate in the well. **(Author's abstract)**

Keywords: *Adiabatic boiling, CHIM-XPT (2016), Isothermal simulation, Matalibong sector, Mineral scaling, Tiwi, Wellbore, Geology*

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INFORMATION AND COMMUNICATIONS TECHNOLOGY

0221

Information and Communication Technology (ICT) Through PowerPoint Presentation: A Tool in Enhancing Teaching-Learning Process

Pakipac, Kenneth B. , Samuel, Freda Kate D. , Dolipas, Bre

The study determined the performance levels in analytic geometry, physics, and statistics of students who had used Information and Communication Technology (ICT) through PowerPoint presentation (PPT) as a tool in enhancing the teaching-learning process. The study also compared the performance levels in analytic geometry, physics, and statistics when students were grouped according to sex and according to the type of learning process used. Results of the study showed performance levels in analytic geometry, Physics, and Statistics of both males and females were satisfactory. Higher performance levels in mathematics problem solving aspect, Statistics concept, and Statistics overall were observed for students who used ICT in their learning process compared to students using the conventional method of teaching. In Physics, performance levels in the concept aspect, the problem solving aspect, and overall performance were all satisfactory regardless of the learning method used. Further research is suggested to verify the results of the study. **(Author's abstract)**

Keywords: *Information and Communication Technology (ICT), ICT instruction, PowerPoint presentation, Physics Performance, Statistics Performance, Analytic Geometry Performance, Information and Communications Technology*

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2020,
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0222

Internet - Based car collision verification system for car insurance companies

Guinto, Mary G

The study has focused in the development of a product that could help the insurance company to verify if their policyholder has encountered an accident or collision. When the car owner encounters an accident or collision it will notify the insurance company via web by sending the pictures of collision and the details of the vehicle, this serves a supporting tool for the insurance policy holder whenever they encountered an accident or collision. The method used for the development of the project is the agile development method. Agile development method attempts to develop a system incrementally, it emphasizes continuous feedback. The hardware materials that were used in this project are the single board which is the raspberry pi, collision sensors that detects the collision, cameras that captures the images when there is an impact detected. The raspberry pi will send the information such as the location of the accident or collision using the GPS, vehicle's plate number and the owner's name via web. A text message will be received by the policyholder when the information is receive in the insurance company's web site. And the insurance company can manage the status of the policyholder's claim. **(Author's abstract)**

Keywords: *Insurance, Raspberry Pi, Sensors, Information and Communications Technology*

Luz y Saber, Volume No. 13 Issue No. 1, 55-60
2019,
(Filipiniana Analytics)
NP

0223

NBP 2.0: Updated Next Bar Predictor, an Improved Algorithmic Music Generator

Fernandez, Proceso L. , Dungan, Beli

Deep neural network advancements have enabled machines to produce melodies emulating human-composed music. However, the implementation of such machines is costly in terms of resources. In this paper, we present NBP 2.0, a refinement of the previous model next bar predictor (NBP) with two notable improvements: first, transforming each training instance to anchor all the notes to its musical scale, and second, changing the model architecture itself. NBP 2.0 maintained its straightforward and lightweight implementation, which is an advantage over the baseline models. Improvements were assessed using quantitative and qualitative metrics and, based on the results, the improvements from these changes made are notable. **(Author's abstract)**

Keywords: *Algorithmic melody generator, NBP, Scale-based data transformation, Information and Communications Technology*

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2022 October,
(Filipiniana Analytics)
NP

MARINE SCIENCE

0224

Community Structure of Periphytic Diatoms in Early-stage Marine Biofilms in a Mariculture-impacted Area

Juinio-MeÃ±ez, Marie Antonette , San Diego-McGlone, Maria Lourdes , Baure, Jer

Periphytic diatoms constitute a major part of complex unicellular aggregations called marine biofilm or periphyton, of which little is known about in tropical marine environments. The early-stage community structure of periphytic diatom genera on two artificial substrates – glass slide and polycarbonate sheets – was characterized. These artificial substrates were placed underwater for 6 d and examined on Days 1, 3, and 6 in four sites around Santiago Island, Bolinao, Pangasinan, Philippines, with different relative distances from the intensive milkfish mariculture area. Correlations of diatom community structures in these sites with physico-chemical factors were investigated. The five most abundant diatom genera – namely, *Cylindrotheca, Nitzschia, Navicula, Amphora,* and *Pleurosigma* – exhibited a weak correlation with nutrients. Less abundant genera *Pseudonitzschia, Haslea, Bacillaria, Thalassionema, Rhizosolenia, Eucampia, Diploneis, Asterionellopsis, Chaetoceros, Bacteriastrum, Licmophora, Skeletonema, Lioloma, Thalassiosira,* and *Thalassiothrix* showed a positive correlation with nutrients. Among sites, the highest benthic diatom cell densities (4.6×10^5 cells cm^{-2}) after 6 d was found in Lucero. Generic richness and diversity varied among sites, with the highest diversity (H' = 1.58) on Day 1 in Tomasa, the site nearest to the mariculture area, whereas the highest richness (D = 2.17–3.26) for all days and diversity (H' = 1.38–1.52) for Days 3 and 6 were recorded in Silaqui, the most distal site. Generally, the highest diversity and richness were found on Day 1, which then decreased on succeeding days in all sites. The lack of a clear pattern in community structure among sites relative to the proximity of these sites to the mariculture area may in part be attributed to the presence of other nutrient sources. Results of the study provide baseline information on the variability of periphytic diatom community structure in a mariculture-impacted area, and insights on how benthic diatoms may be used in monitoring the impacts of nutrient pollution. **(Author's abstract)**

Keywords: *Benthic diatom, Community structure, Mariculture, Marine biofilm, Marine science*

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2022,
(Filipiniana Analytics)
NP

0225

Density and Size Distribution of the Commercial *Beche-de-mer, Actinopyga echinites* (Jaeger, 1833) in Cabgan, Barobo, Surigao del Sur, Philippines

QuiÃ±ones, Mariefe B. , Arriesgado, Elgen M. , Leopardas, Venus E. , Sornito, Marnelle B., Tubio, Emili

Actinopyga echinites are among the commercially exploited sea cucumbers; however, limited studies hinder the management interventions for the sustainability of the resource. This study investigates the density and size distribution of *A. echinites* populations in Cabgan Island, Barobo, Surigao del Sur from March–August 2021 with two stations (shallow seagrass beds as Station 1 and algal flats as Station 2) having three plots (100 m^2) laid as monitoring stations. The results revealed the population density of *A. echinites* ranged from 567–2,567 ind/ha with a mean of 1,572 ± 225 ind/ha in Station 1 and 733–2,400 ind/ha and a mean of 1,389 ± 178 ind/ha in Station 2. Significant differences were only observed across months in each station (P = 0.00) and their interaction between months and stations (P = 0.01). *A. echinites* had a mean length of 7.58 ± 0.26 cm and weight of 31.39 ± 1.62 g for Station 1 and 7.84 ± 0.47 cm and 39.01 ± 3.91 g for Station 2. Specimens in Station 2 had a greater length and significantly heavier weight than in Station 1 (P = 0.00). Across months, significant differences were recorded for the specimen's length in Station 1 and weight for both stations. The length of *A. echinites* ranged from 4–12 cm and 4–13.5 cm in Stations 1 and 2, respectively, and weight of 5–129 g in both stations. The highest frequencies were recorded at 7 cm in both stations and shifted to 9 cm. Weight distributions showed the highest frequencies in 35 g in the two stations. The present study shows that the population is still abundant and is more influenced by the sampling months than the stations. The species are smaller compared to other studies and might exhibit habitat preferences. Weight size distribution varied across months and could be related to their reproduction. The study provides significant insights needed for this species' conservation and fishery management. **(Author's abstract)**

Keywords: *Conservation, Holothurian, Mindanao, Population study, Sea cucumber, Marine science*

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2022 August,
(Filipiniana Analytics)
NP

0226

Development of Pag-asa Reefs, West Philippine Sea: Role of Relative Sea Level Change and Wave Exposure

Bringas Dennis Arsenio B. , Dayao, Jelee B. , de Chavez, Maylord M. , Morata, Michael Jayson S. , del Rosario, Aiko Love B. , Co, Paolo Emanuel Y. , Carrillo, Anne Drew V. , Gabuyo, Mary Rose P. , Janer, Denise Faye S., Villanoy, Cesar L. , Siringan, Fernand

Atoll reefs are associated with subsiding regions. In the West Philippine Sea, the Kalayaan Island Group is an emergent feature of the region's atoll reefs. In this study, we established the long-term rate of subsidence in the Pag-asa Atoll Reefs by indicators of sea level positions on the seafloor and in Pag-asa Island. For submerged indicators of paleo-sea levels, a multibeam bathymetry with a 5-m resolution was used as the primary data source. Four pairs of submerged terraces and scarps, interpreted as former coral reef flats and reef fronts, respectively, were mapped. The terraces, PARa-d, from shallowest to deepest, occur at depth ranges of 7–10, 36–45, 82–90, and 115–120 m. The step-like morphology of the slopes off Pag-asa is likely due to the backstepping of reefs during the overall rise of sea level from the Last Glacial Maximum (LGM). Terraces PARa-d are interpreted as records of reef re-establishments during the stillstand periods following meltwater pulse event (MWP)-1C, MWP-1B, MWP-1A, and MWP-2B/2A. There is no clear morphological indicator of coral terraces that can be attributed to the LGM period. Variation in the widths and depths of the terraces between the leeward and windward sides of the island is also observed. Greater wave exposure appears favorable for coral reef terrace growth in Pag-asa, except for deeper terraces. The possible absence of the deepest terrace on the north side and an LGM terrace is attributed to possible thinner coral reef accretion due to the combination of cooler waters and possible swifter winds prior to 14 kyr. Correlation of the terrace depths and beach rock elevations as Pag-asa with the paleo-sea level of correlative stillstand events indicate long-term subsidence of 1.2 mm/yr between 15–12 kyr that declined to 0.3 mm/yr between 12 kyr to present. With sea level rise due to global warming and continuing subsidence,

Pag-asa Island is threatened by coastal erosion, more frequent inundation, and groundwater salinization that needs to be addressed through proper adaptation practices. **(Author's abstract)**

Keywords: *Backstepping, Sea level, Submerged terraces, Subsidence, Wave exposure, West Philippine Sea, Marine science*

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(Filipiniana Analytics)
NP

0227

The Gregorio T. Velasquez Phycological Herbarium (MSI): A Legacy and National Heritage

SantiaÃ±ez, Wilfred John E. , Ganzon-Fortes, E

We present here the history and contents of one of the most important herbaria in the Philippines – the Gregorio T. Velasquez Phycological Herbarium of the Marine Science Institute (MSI) at the University of the Philippines (UP) Diliman. The MSI herbarium was established in the early 1970s by Dr. Gavino C. Trono Jr. and was named in honor of his mentor Dr. Gregorio T. Velasquez, the "Father of Philippine Phycology." Collections in the MSI herbarium are primarily made by Filipino phycologists within the coasts and offshore islands and reefs of the Philippines. The MSI herbarium currently holds ~ 55,000 algal and seagrass specimens collected from various areas in the country and abroad. As the largest repository of marine plants in the Philippines and the ASEAN (Association of Southeast Asian Nations) region, we consider the MSI herbarium as both a legacy and national heritage that we owe to the pillars of Philippine phycology – Dr. Gavino C. Trono Jr. and the late Dr. Gregorio T. Velasquez. **(Author's abstract)**

Keywords: *Algae, Biodiversity, Herbarium, Philippines seagrass, Seaweeds, Tropical seaweeds, Marine science*

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2022,
(Filipiniana Analytics)
NP

0228

Growth and Carrageenan Quality of Sporophyte and Gametophyte of the Commercially Important Red Seaweed *Kappaphycus alvarezii*

Sollesta-Pitogo, Hananiah , Mateo, Jonalyn P. , Luhan, Maria Rovi

One dilemma facing the farming of the carrageenophyte *Kappaphycus* is the deteriorating quality of seedstock. Rejuvenating the commercial stocks using spores from reproductive wild parents that are sexually and asexually produced could perhaps restore the traits that are useful for culture. The use of gametophyte and sporophyte (=tetrasporophyte) phases of *Kappaphycus alvarezii* from spores is explored as a source of seedstock. The growth and physical properties of semi-refined carrageenan extracted from the resulting sporophyte and gametophyte thalli of the same ages were determined. The growth rate of the diploid tetrasporophyte thalli was significantly higher than that of the haploid gametophyte. Gel strength and yield of semi-refined carrageenan from the two life cycle phases were not significantly different, whereas the viscosity was significantly higher in the diploid tissues. Kappaphycus sporophytes were potentially superior to gametophytes as a source of seedstock for mariculture, but problems need to be addressed – including improving the growth rate and reducing the cost of production – before its application could be realized. **(Author's abstract)**

Keywords: *Carrageenan quality, Gametophyte, Growth, Kappaphycus, Sporophyte, Tetrasporophyte, Marine science*

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2022,
(Filipiniana Analytics)
NP

0229

Linking Thallus Morphology with P-I Curves of 50 Macrobenthic Algae from Bolinao, Pangasinan, Philippines

Ganzon-Fortes, Edna T. , Saco, Jayvee A

This study demonstrated that thallus morphology could affect a species' capacity to utilize light for photosynthesis and, hence, will affect its productivity. Fifty (50) macroalgal species collected from an intertidal habitat in Bolinao, Pangasinan, Philippines were grouped into five "functional-forms" based on their inferred productivity: functional-form group (FFG) A: very thin tubes/sheets/strips, FFG B: thin sheets/delicately branched, FFG C: medium-thick blade/coarsely branched with dense ramuli, FFG D: heavily thick branches/segments or with moderate calcification, and FFG E: heavily calcified. Their photosynthesis-irradiance (P-I) curves were determined through the measurement of oxygen evolved in a closed system after 1-h incubation under six different light treatments. P-I curve parameters such as P^n_{max}, I_k, I_c, α, and R_d were assessed to determine the groups' physiological responses to light. The thickness of thallus blades, coarseness of branches, complex branching, and calcification appeared to lessen photosynthetic capacity, as shown by the significantly decreasing trend of P^n_{max} from FFGs A–E. FFG A also showed the steepest slope (highest mean α value) compared with the rest of the functional-form groups, indicating their efficiency to utilize low light for photosynthesis. Light saturation and compensation values were less distinct in differentiating the functional form groups, probably because the seaweeds examined were all collected from the same shallow intertidal zone, suggesting their acclimation to similar photon flux densities. Results from this study fit the prediction of the function form hypothesis for seaweeds quite well. **(Author's abstract)**

Keywords: *Compensation irradiance (Ic), Initial slope (#945), Photosynthesis, Saturating irradiance (Ik), Thallus morphology, Tropical seaweeds, Marine science*

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2022,
(Filipiniana Analytics)
NP

0230

Local Tide and Geoid Corrections Significantly Improve Coastal Retracked Jason Sea Surface Heights in the Philippines

Bauzon, Ma. Divina Angela , Alfante, Rey Mark , Rediang, Abegail , Amedo-Repollo, Charina Lyn , Reyes, Rosalie B. , Flores, Paul Caesar M., Pasaje, Nikki , Bringas, De

Retracking algorithms increase the accuracy of coastal sea surface height (SSH) measurements. However, it is still important to validate these retracking estimates with tide gauge (SSH_{tg}) observations. We downloaded the freely available Jason altimeter SSH processed using the XTRACK-ALES algorithm, then detided the SSH using different tide models. The first model is the default tidal correction based on Finite Element Solution 2014 (SSH_{fes}), and the second model is the T_Tide harmonic analysis of the nearest tide gauge ($SSH_{altimeter}$). SSH_{fes} showed a very poor correlation (< 0.31) and very high root mean square error (RMSE, > 29 cm). In contrast,

$SSH_{altimeter}$ generally showed a very high correlation (> 0.91) and low RMSE (< 17.4 cm). A further quality check based on the average and standard deviation of the difference between the SSH readings ($SSH_{fes} - SSH_{tg}$ and $SSH_{altimeter} - SSH_{tg}$) also showed the superior performance of $SSH_{altimeter}$, which scored < 9.3 and < 16.5 cm, respectively; compared to SSH_{fes}, which scored < 9.3 cm and > 27 cm for the same parameters. The poor performance from the SSH_{fes} likely comes from the complex bathymetry and coastal geomorphology of the country, which is not accounted for in the FES. The Philippines generally has a narrow shelf, and the FES tide corrections may be related to deep-water tides rather than the shallow-water tides observed from tide gauges. Despite the high correlation and agreement between the $SSH_{altimeter}$ and SSH*tg*, the rate of sea level rise from the SSH*altimeter* in some sites is more than twice the rate from SSH_{tg}, which indicates the possible influence of the vertical land movement. **(Author's abstract)**

Keywords: *Coastal altimetry, Sea level, Sea surface height, Vertical land movement, XTRACK-ALES, Marine science*

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2022 December,
(Filipiniana Analytics)
NP

0231

Marine Heatwaves and their Impacts: Research Perspectives in the Philippines

Cortes, Aiza , Atup, Dale Patrick D. , Quilestino-Olario, Raven , Concolis, Brenna Mei M. , Edullantes, Brisneve, YÃ±iguez, Alett

Marine heatwaves are discrete and prolonged periods of anomalously warm seawater temperature which have devastating ecological and socioeconomic impacts. Being part of the center of marine biodiversity and a fisheries-dependent country, the Philippines is vulnerable to the threats of marine heatwaves, but these extreme events remain understudied in the country. It is, therefore, crucial to investigate the development of marine heatwaves and to assess and predict the impacts of these events in the Philippine seas. In this perspective paper, we aim to put forward the research direction for advancing our understanding of marine heatwaves and their impacts in the Philippines. The limited studies on marine heatwaves in the Philippines highlight the need for progress in understanding the spatiotemporal patterns, physical processes, and impacts of marine heatwaves in the country. Advancing our knowledge of marine heatwaves will help us formulate mitigating strategies for ocean warming in fisheries management and marine biodiversity conservation in the Philippines. **(Author's abstract)**

Keywords: *Climate change, Coral bleaching, Extreme thermal events, Fish kills, Harmful algal blooms, Marine science*

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(Filipiniana Analytics)
NP

0232

Phylogenetic Study of *Sargassum polycystum* (Sargassaceae, Ochrophyta) in Eastern Samar, Philippines Based on the Nuclear rDNA Sequences

Sison-Mangus, Marilou , Fabillo, Melodina , Yap-Dejeto, Leni G. , Dumilag, Rich

Sargassum polycystum is an economically important seaweed endemic to Southeast Asian waters. Genetic diversity studies conducted for this alga have been based on samples from various areas in the Indo-Pacific region. Here, we examined the phylogenetic patterns of *S. polycystum* in Eastern Samar, Philippines using the nuclear

ribosomal DNA (rDNA) region – including ITS1, 5.8S gene, and ITS2. The phylogenetic and haplotype analyses using these loci indicate that the Eastern Samar samples contain 13 haplotypes. Using the ITS2 region sequences alone (to include other Indo-Pacific samples), we found that the number of Eastern Samar haplotypes was reduced to six, with one common haplotype found in Singapore and Indonesia. Our findings indicate that the genetic diversity of Eastern Samar *S. polycystum* is substantially higher than previously suggested. Consistent with the previous hypothesis, the populations of *S. polycystum* in Southeast Asian waters indicate a range expansion. The study could extend our understanding of the genetic diversities of *S. polycystum* in the Philippines and elsewhere. **(Author's abstract)**

Keywords: *5.8S gene, Distribution, ITS1, ITS2, Seaweed, Sargassum, Marine science*

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2022,
(Filipiniana Analytics)
NP

0233

Spawning, Larval Development, and Juvenile Rearing of White Teatfish *Holothuria fuscogilva* in the Hatchery in the Philippines

Magcanta-Mortos, Maria Lyn M. , BesoÃ±a, Jomar F. , Bucay, Delyn M. , Navarro, Victor R. , Tubio, Emilie G. , Uba, Kaent Immanuel N. , Arriesgado, Dan M., Uy, Wilfred

The significant exploitation of the high-value white teatfish, *Holothuria fuscogilva*, has raised global concerns about the species' wild populations. Aquaculture technology development may potentially restore dwindling stocks; however, it remains to be established in the Philippines. This study reported the first successful mass production of *H. fuscogilva* in the Philippines. The broodstock was collected on two occasions from Tubajon, Laguindingan, Misamis Oriental (May and June 2020). All broodstock survived with no evisceration in 30 min (27.8–35.2 ËšC) of transport to the hatchery. Broodstock was induced to spawn using spawning techniques adopted from those of Agudo (2006) with modification in three events (July, August, and December 2020). However, successful spawning only occurred when the temperature was reduced by 7 ËšC (extreme cold shock). H. fuscogilva produced 3.4 million eggs in three spawning inductions at > 88% fertilization rate. The eggs hatched 2–3 d post-fertilization. Generally, the embryonic development of *H. fuscogilva* was radial holoblastic, and the larval development had the same pattern as other sea cucumber species. The auricularia stage was observed at Days 4–27, followed by the doliolaria stage at Days 28–32, and pentactula stage at 33–39 d post-fertilization. An average of 1.1% of the fertilized eggs proceeded to the juvenile stage at 40–45 d post-fertilization. Over 4 mo, juveniles grew at 0.03 ± 0.002 g d–1. This is the first documentation of the larval development of *H. fuscogilva* and the first production of the juvenile stage in the Philippines, where 15,000 juveniles are being grown in the hatchery for future broodstock. **(Author's abstract)**

Keywords: *Early development,, Hatchery, Holothuria fuscogilva, Larvae, Sea cucumber, Spawning induction, Marine science*

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NP

0234

Wild *Kappaphycus* cf. *striatus* Growing in a Mangrove Stand in Siasi, Sulu, Philippines

Serag-Endonila, Karen Joy B. , Bara, Aldimar S. , Turong, Jimal A. , Galera, Jesse Jan M., Halun, Sitti Zayd

We report the presence of *Kappaphycus* cf. *striatus* growing in a mangrove stand in Buan, Siasi, Philippines. These plants might have originated from the wild or nearby extensive seaweed farming areas. This is the first account of wild *Kappaphycus* growing in a mangrove habitat and exhibiting adaptive strategies to avoid desiccation stress. These seaweeds formed scars on their thalli tips and displayed a dense morphology to reduce the surface area exposed to air. This report provides new insights into the capacity of *Kappaphycus* to adapt to adverse environmental conditions which could improve their chances of survival in a changing climate but could also pose a threat to other ecosystems and natural biota. **(Author's abstract)**

Keywords: *Climate change, Desiccation tolerance, Kappaphycus, Mangroves, Red seaweeds, Sulu, Marine science*

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2023 April,
(Filipiniana Analytics)
NP

MATHEMATICS

0235

Faith, Family, and Friends as Integral Factors in Student Resilience in the Ateneo de Manila School of Science and Engineering

Lee-Chua, Que

The significant exploitation of the high-value white teatfish, Holothuria fuscogilva, has raised global concerns about the species' wild populations. Aquaculture technology development may potentially restore dwindling stocks; however, it remains to be established in the Philippines. This study reported the first successful mass production of H. fuscogilva in the Philippines. The broodstock was collected on two occasions from Tubajon, Laguindingan, Misamis Oriental (May and June 2020). All broodstock survived with no evisceration in 30 min (27.8–35.2 ËšC) of transport to the hatchery. Broodstock was induced to spawn using spawning techniques adopted from those of Agudo (2006) with modification in three events (July, August, and December 2020). However, successful spawning only occurred when the temperature was reduced by 7 ËšC (extreme cold shock). H. fuscogilva produced 3.4 million eggs in three spawning inductions at > 88% fertilization rate. The eggs hatched 2–3 d post-fertilization. Generally, the embryonic development of H. fuscogilva was radial holoblastic, and the larval development had the same pattern as other sea cucumber species. The auricularia stage was observed at Days 4–27, followed by the doliolaria stage at Days 28–32, and pentactula stage at 33–39 d post-fertilization. An average of 1.1% of the fertilized eggs proceeded to the juvenile stage at 40–45 d post-fertilization. Over 4 mo, juveniles grew at 0.03 ± 0.002 g d–1. This is the first documentation of the larval development of H. fuscogilva and the first production of the juvenile stage in the Philippines, where 15,000 juveniles are being grown in the hatchery for future broodstock. (**Author's abstrac**t)

Keywords: *Early development, Hatchery, Holothuria fuscogilva, Larvae, Sea cucumber, Spawning induction, Mathematics*

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2022 December,
(Filipiniana Analytics)
NP

0236

Mathematics interest and the scholastic performance of the Grade 7 students

Docejo, Emer Anthony , Balolong, Cliff

Factors affecting math interest is a good benchmark for teachers in order to increase the students' understanding and appreciation in mathematics. This study would like to determine the factors that contributed to the math interest of junior high school students and how these factors have affected their scholastic performance. The data were collected using questionnaires. These were distributed to the 210 Grade 7 students chosen using a stratified random sampling design. The factors were correlated with the grades of the students up to the 3rd Grading period. This investigation found that teacher qualities and the strategies employed strongly affect the students' interest but factors such as math anxiety, students' attitude and classroom condition can predict the scholastic performance. Thus, teachers may affect interest but the students' perception can affect their grades. It is recommended that teachers utilize more strategies to raise the level of interest and give due attention to the students' attitudes in order to address their need to understand math. create a positive learning environment employing relevant real life problems so students appreciate Mathematics as a tool that can be used in life and that the guidance office may provide counseling sessions to students with high math anxiety. **(Author's abstract)**

Keywords: *Math interest, Math anxiety, Teacher factors, Scholastic performance, Mathematics*

Luz y Saber, Volume No. 13 Issue No. 1, 6-15
2019,
(Filipiniana Analytics)
NP

0237

Sparse Spatial Autoregressive and Spatio-temporal Models for COVID-19 Incidence in the Philippines

Barrios, Erniel B. , Ocampo, Shir

Philippine COVID-19 data have so many gaps resulting from lack of mass testing, late reporting of test results, and unreported cases – leading to too much noise and sparsity. A sparse spatial autoregressive model linking COVID-19 incidence and mortality rates to the healthcare system, demographic and economic indicators, disease prevalence, vaccination, urbanity, and environmental factors is proposed. The model allows for irregular spatial units accounting for temporal dependencies within a neighborhood was estimated using the Cochranne-Orcutt procedure embedded into the backfitting algorithm. Daily COVID-19 cases and deaths across provinces and cities in the National Capital Region (NCR) from 01 April 2020–15 September 2021 show a significant association of COVID-19 prevalence rate with the number of health workers, revenue of the local government unit (LGU), and prevalence of tuberculosis (TB). On the other hand, COVID-19 mortality rates are associated with the number of health workers, number of licensed COVID-19 testing laboratories, number of cities in an LGU, revenue of the LGU, prevalence rate of cancer, and prevalence rate of TB. The models emphasize the importance of resources available in the LGU that can boost the capabilities of the health care system. Pre-existing health conditions (co-morbidities) in the communities also determine the prevalence and mortality rates of COVID-19 in the Philippines. **(Author's abstract)**

Keywords: *Additive model, Backfitting algorithm, COVID-19, Healthcare system, Spatial autoregression, Spatio-temporal model, Mathematics*

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2022 October,
(Filipiniana Analytics)
NP

0238

Spatiotemporal Asymmetric Modeling of the Long Run Response of Corn Productivity to Environmental Variabilities

Pantolla, Her

A spatiotemporal statistical model for the corn productivity of Bulacan using local and global variables was generated. The data from January 1995–September 2019 for a total of 99 quarters were used. Necessary imputations and conversions aside from a transformation technique were done to match the data and generate the best fitting model. The nonlinear autoregressive distributed lag was used to determine the asymmetric long-run effects on the corn production volume of the province to the potential positive and negative changes in the amount of rainfall, minimum temperature, maximum temperature, the water level of Angat Dam, atmospheric carbon dioxide concentration, and sea surface temperature anomaly. It also included the land area harvested as a deterministic factor. The findings show that the corn production of the selected area responds to both negative and positive shocks to the rainfall amount and availability of water supply in the dam in the long run. It also shows that the long-term effects of an increase in the minimum temperature are detrimental, whereas rising levels of carbon dioxide concentration in the environment could be profoundly contributory to the dependent variable, at least in a direct manner. Several diagnostic tests substantiated the fitness of the econometric model. The empirical findings of this study extend the generally collective results of existing literature. It may also be used as a basis for plans of action for sustainable production practices of the grain, as well as other crops in the uncertain future amidst the threat of environmental stresses. **(Author's abstract)**

Keywords: *Asymmetric modeling, Bulacan, Climate change, Corn production, Nonlinear autoregressive distributed lag, Mathematics*

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NP

MEDICINE

0239

A 44-year-old Male Filipino with Spontaneous Acute Subdural Hematoma and Subarachnoid Hemorrhage Caused by a Dural Arteriovenous Fistula of the Occipital Lobe: A Case Report

Belonguel, Noel J. , Vista, Giova

Introduction. Spontaneous acute subdural hematoma (ASDH) is rare and comprises 2.6% of all ASDH. In one recent study,only 178 spontaneous ASDH were documented. However, only 1 case was attributed to dural arteriovenous fistula (dAVF). Vascular malformations cause less than 10% of subarachnoid hemorrhage (SAH). Spontaneous ASDH and SAH occurring together are extremely rare. Literature is scarce on cases with dAVF of the occipital lobe as a cause of simultaneous spontaneous ASDH and SAH.

Objective. This paper aims to present a case of a spontaneous acute subdural hematoma and subarachnoid hemorrhage caused by a dural arteriovenous fistula of the occipital lobe, along with its clinical presentation, diagnosis, and treatment.

Case Summary. A 44-year-old Filipino male with no history of trauma presented with severe headache, vomiting, and decreasing sensorium – CT scan revealed acute parenchymal bleed in the left occipital lobe with subarachnoid extension and subdural hematoma in the left fronto-parieto-temporal convexity along the tentorium cerebelli and posterior interhemispheric falx. Due to the location of the lesion seen on the CT scan and the gender distribution, Arteriovenous malformation (AVM) was initially considered, thus proceeded to computed tomography angiogram (CTA) to establish the diagnosis of vascular anomaly, however, revealed dAVF instead. Four-vessel angiogram was done to assess the tributaries of the dAVF and confirmed the diagnosis. Complete obliteration of dAVF of the occipital lobe was done with Onyx Embolization in one session.

Conclusion. This is the first case of Borden type II, Cognard type IIa+IIb dAVF, as reported in this institution. Although extremely rare as a cause of SAH and ASDH, dAVF should be considered a differential diagnosis in patients with no identifiable common cause of the new onset of severe headache and poor neurologic status. **(Author's abstract)**

Keywords: *Spontaneous acute subdural hematoma, Subarachnoid hemorrhage, Intracranial dural arteriovenous fistula, Medicine*

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0240

Acute Pancreatitis in Early Postpartum Woman with Confirmed Covid-19: A Rare Case Report

Arjunadi, Botefilia , Lisnawati, Yuyun , Pradana, Agatha, Suryamin, Mau

Background: The Coronavirus disease 2019 (COVID-19) pandemic is a significant challenge for public health and clinical medicine. COVID-19 mainly impairs the respiratory tract. However, gastrointestinal manifestations of COVID-19 are increasingly being recognized. Although acute viral pancreatitis has been described in other viral infections, pancreatic involvement in SARS-CoV-2 disease is still poorly defined. We reported a case of acute maternal pancreatitis in an early postpartum period woman with confirmed COVID-19.

Case Presentation: A 31-year-old woman in term pregnancy had a caesarean section due to acute respiratory distress syndrome (ARDS) caused by COVID-19 pneumonia. One day after surgery, her stomach appeared bloated, bowel sounds were weak, and her abdominal circumference increased. Ultrasound examination did not reveal any suspicion of bleeding or hematoma. Her abdominal contrast-enhanced computerized tomography (CT) scan showed small bowel obstruction and oedematous pancreas. Amylase levels increased to 382 units/litre and lipase levels to 724 units/litre. C-reactive protein and procalcitonin were also increased. The diagnosis of sepsis was made, and she received broad-spectrum antibiotics and treatment for the COVID-19 infection. Recovery was characterized by a gradual resolution of abdominal and pulmonary signs and symptoms. A decline of amylase and lipase was observed by the tenth day. On the 13th day, she was extubated and gradually recovered from respiratory symptoms, with a negative result for COVID-19 RT-PCR. Based on this case, we consider that pregnancy and COVID-19 support each other as the cause of acute pancreatitis.

Conclusion: Early diagnosis and severity classification are essential steps for successful management because late recognition and treatment may allow a greater prevalence of associated complications. **(Author's abstract)**

Keywords: *Pancreatitis, COVID-19, Pregnancy, Caesarean section, Case report, Medicine*

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0241

Addressing Problems in Accident Management in a Shopping Complex through Action Research

Sandejas, Benedict Nichola

Introduction. Accidents are unpredictable and sometimes unavoidable. Businesses such as shopping complexes need to follow safety protocols to ensure that nobody is hurt. The shopping complex should have preventive measures and an accident management team to offer efficient and timely treatment for these accident victims.

Objective. This paper aims to identify problems experienced by the accident management team in dealing with accidents in a shopping complex. The report will also propose and implement solutions to all issues identified.

Methods. Two action research cycles were conducted for this paper, with the results of the first action research flowing into the second action research cycle. Reeves et al.'s interprofessional teamwork framework addressed concerns related to teamwork. The data used in this action research came from journal entries, informal and formal one-on-one discussions, and discussions with each department.

Results. The workflow for the current post-accident management activities was evaluated. The problems identified were grouped into 5: roles and responsibilities, procedures, knowledge transfer, logistics, and skills. The issues concerning the roles and responsibilities of each team member were addressed by realigning these with their current skills, training, and job description. The remaining and new problems were addressed by developing an accident management policy. Inclusions in the policy are protocols on transporting patients, communication and transportation procedures, letter of authorization (LOA) approval procedures, post-accident evaluation procedures, pre-accident recommendations, policy revision procedures to address organizational changes, changes in the job description or government regulatory mandates, and the evaluation of current skills in case training is needed.

Conclusion. Accident management requires a coordinated effort amongst all the team members, with members from different social and health specialties. Using Reeves et al.'s interprofessional teamwork framework, the team identified the problems and implemented solutions by realigning the roles and responsibilities of each team memberand implementing an accident management policy that can improve preventive measures and improve post-accident responses. **(Author's abstract)**

Keywords: *Accident management, Policy development, Accountability, Action research, Risk management, Medicine*

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0242

Analysis of Caffeine-Etoricoxib Pi-Electron Stacked Complexes: A Basis for Future Parenteral Preparations

Bolibol, Marvin B. , Magboo, Mark Scyld L. , Miranda, Kevin Jace A. , Castillo, Agnes L. , de Guzman, Gerard Q., Joson, Romalyn

Etoricoxib, although exhibiting superior and selective anti-inflammatory properties, exhibits poor aqueous solubility which precludes its formulation into parenteral preparations. This study aims to increase the aqueous solubility of this drug by complexation with caffeine, an aromatic base known to exhibit a pi-pi stacked complex with aromatic drugs. The molar complexation between caffeine and etoricoxib was analyzed by phase solubility studies, Jacob's continuous variation, and Ardon's plots. Solid-state analyses and *in vitro* diffusion experiments were employed to analyze the optimized caffeine-etoricoxib complex (OCEC). The *in vitro* inhibitory properties of OCEC against cyclooxygenase 2 enzyme (COX-2) were compared to plain etoricoxib (PE). Phase solubility diagrams showed that the solubility of etoricoxib (0.25 M) was continuously elevated with increasing caffeine

concentration as a result of complexation. Optimization experiments showed that caffeine complexes with etoricoxib at a 1:1 molar ratio. The effects of pH on degradation showed that etoricoxib within the OCEC is most stable at pH 7.4. The release of etoricoxib from OCEC follows super case 2 transport mechanisms with high diffusivity. In terms of *in vitro* inhibition against COX-2, OCEC (IC_{50} = 0.125 mcg/mL) is more potent than PE (IC_{50} = 3.1 mcg/mL). This study revealed that a 1:1 molar stacked complex between caffeine and etoricoxib drastically increases the aqueous solubility of the latter, a greater stability of the drug at pH 7.4, a Korsmeyer-Peppas diffusion kinetics involving non-Fickian drug release, and enhanced *in vitro* COX-2 inhibitory effects. **(Author's abstract)**

Keywords: *Caffeine, Cyclo-oxyenase-2, Etoricoxib, Stacked complexes, Medicine*

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0243

Anaplastic Cerebellar Ependymoma in an Adult Female presenting with Tonsillar Herniation successfully treated with Chemotherapy: A Case Report

Manalo-Igot, Mary Ondinee , Guerrero, Vic

Introduction: Ependymomas are slow-growing neuroectodermal tumors that may arise from various parts of the central nervous system. Anaplastic ependymoma represents 3-5% of ependymomas, and it is rarely found in adults and the infratentorial area, particularly the cerebellum. This paper discusses the first reported case of an adult female with anaplastic cerebellar ependymoma who underwent surgery and was treated with chemotherapy for tonsillar herniation.

Case Presentation: This is a case of a 58-year-old Filipino female with a five-month history of dizziness, headache, nausea, and vomiting. Cranial computed tomography (CT) scan revealed the presence of hydrocephalus with enhancing lesions at the right cerebellum. The patient underwent ventriculoperitoneal shunting (VPS) with sub-total
excision and biopsy of the right cerebellum. Histology and immunochemistry were consistent with a high-grade anaplastic ependymoma (WHO Grade III). Cerebrospinal fluid and spinal magnetic resonance imaging (MRI) were negative for tumors. The initial plan was to undergo limited field external beam radiation therapy to the cerebellum. However, the patient was lost to follow-up. Two months after surgery, she presented with similar symptoms. MRI revealed tonsillar herniation and interval progression of the mass compressing the fourth ventricle, pons, and medulla oblongata; thus, medical decompression urgent chemotherapy with cisplatin and etoposide were started. After four chemotherapy sessions, repeat cranial MRI revealed resolution of tonsillar herniation and interval regression of the mass.

Conclusion: This paper presented a rare case of anaplastic cerebellar ependymoma with tonsillar herniation, successfully treated with chemotherapy. Radiotherapy is the standard of care following surgical resection. Still, our case management showed that in a patient with tumor progression presenting with tonsillar herniation, alternative
management is to give systemic chemotherapy instead of radiotherapy. **(Author's abstract)**

Keywords: *Anaplastic cerebellar ependymoma, Chemotherapy, Herniation, Medicine*

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NP

0244

Anti-Myeloperoxidase (MPO) associated Vasculitis in a Young Filipino Male with Bronchiectasis: A Case Report

Penserga, Ester G. , Quiambao, Antonio Lore

Background: ANCA-associated vasculitis and its subtypes have been associated with pulmonary manifestations, with bronchiectasis being a unique clinical presentation.

Case Summary: We report the case of a 26-year-old Filipino male who presented with progressive dyspnea, neuropathic pain, and purpuric rash. Diagnostic evaluation revealed upper lobe bronchiectasis and lower lobe pneumonia, as well as hematuria and proteinuria. ANCA-associated vasculitis (AAV) and tuberculosis were considered. There was improvement of dyspnea, cough and rashes with antibiotics, glucocorticoids (GC), and anti-TB coverage. However, neuropathic pain progressed to the upper and lower extremities with development of weakness. Anti-myeloperoxidase (MPO) Anti-Neutrophil Cytoplasmic Antibody (ANCA) was positive, Electromyography-Nerve Conduction Velocity (EMG-NCV) revealed diffuse sensorimotor axonal polyradiculopathy of both upper and lower extremities. Cyclophosphamide was then given.

The patient gradually regained his motor strength while sensory deficits persisted. He was referred to rehabilitation medicine for physical therapy and eventually discharged. This case highlights vasculitis as an associated extrapulmonary manifestation of bronchiectasis, and the possible role of bronchiectasis in the immune-mediated pathogenesis of ANCA- associated vasculitides. **(Author's abstract)**

Keywords: *Bronchiectasis, ANCA-associated vasculitis, Anti-MPO, Medicine*

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0245

Approach to Lower the Cardiovascular Risk of Individuals with Type 2 Diabetes Mellitus: Evidence-based Consensus Statements of the Philippine Heart Association and Philippine Society of Endocrinology Diabetes and Metabolism

Matawaran, Bien J. , Jimeno, Cecilia A. , Sison, Jorge A., Caole-Ang, Imelda , Gonzales, Eddieso

Diabetes remains as the 6th leading cause of death in the Philippines, with more than 33,000 deaths in 2016. Given this alarming prevalence, it is imperative that this public health concern be prioritized in the country and to answer such concern, a group of cardiologists and endocrinologists who are in active clinical practice and research, formed a technical working group composed of five members. Their primary objective was to develop an evidence-based consensus document for Filipino healthcare practitioners and people in the academe that would serve as a guideline on the approach to lower the CV risk of individuals with T2DM. The TWG agreed on focusing with the pharmacological approach to treatment of lowering CV risk for T2DM patients using the ADAPTE model which is a more systematic approach to guideline adaptation. The recommendations were developed using the ADAPTE framework appraising all international practice guidelines and recommendations through to 2013. The technical working group's overall objective of guideline adaptation is to take advantage of the existing guidelines to enhance the efficient production and use of high-quality adapted guidelines specially in the local Philippine setting. Each of these articles was then assessed using the AGREE instrument. Based on the key questions that the technical working group had identified regarding the approach to lower the risk of individuals with type 2 diabetes, 9 recommendations concerning the antidiabetic drug of choice for persons with type 2 diabetes with or without established ASCVD and management of type 2 diabetes mellitus patients with hypertension and dyslipidemia were drafted and are presented in this report. **(Author's abstract)**

Keywords: *Type 2 diabetes mellitus, Cardiovascular risk, Treatment recommendations, Medicine*

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0246

Assessment of Knowledge and Skills of Barangay Health Workers: Basis for Diabetes Education Program for Lay Persons

Puno, Mercerose P.J. , Florido, Leyden V. , Florendo, Josefina E. , Esguerra, Ana Leah D. , De Leon, Anjanette S. , Mejilla, Joylyn L., Reyes, Ray Justin M. , Tangkeko, Eleono

This study aimed to determine the level of knowledge and skills of the barangay health workers (BHW) about diabetes management. A descriptive correlational design that included 121 BHWs in Bustos, Bulacan was utilized in the study. A test and skill demonstration checklist was utilized to determine the knowledge and skills of BHWs about diabetes management. Categorical variables such as the respondents' profile were described using frequencies and percentages. Continuous variables such as level of knowledge and skills were summarized using central tendency measures (mean) with standard deviation. Pearson correlation test for association was used to test for relationship between level of knowledge and skills. Pearson Chi square was used to test association between demographic variables and level of knowledge and skills. Ap value of <0.05 was considered significant in the analysis of the results. Results showed that the overall level of knowledge of the BHWs was satisfactory but varied in many aspects of diabetes management. The BHWs level of knowledge in determining signs and symptoms and diagnosis of diabetes was high but low in determining types of diabetes mellitus. The level of skills of the BHWs was high in blood pressure measurement but low in blood glucose monitoring. BHWs have varied knowledge and skills in diabetes care management. There is a need to train the BHWs further to develop their knowledge and skills. The nurse diabetes educators must provide diabetes education program for BHWs that are focused on competencies to deliver safe and appropriate health teaching activities utilizing the basic concepts and principles of diabetes management. **(Author's abstract)**

Keywords: *Diabetes Management Self Education, Diabetes Type 1, Diabetes Mellitus, Diabetes Nurse Educator, Medicine*

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0247

Assessment of Knowledge, Attitudes, Beliefs and Practices among Doctors, Nurses and Other Allied Health Practitioners in Makati Medical Center with Regards to the Care of Patients with Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome (H

Caoili, Janice C. , Galang-De Leon, Waiva

Introduction: Human immunodeficiency virus infection (HIV) and Acquired Immunodeficiency Syndrome (AIDS) prevalence has been increasing for the past years in the Philippines since the early 1980s. The health care team which is comprised of doctors, nurses, pharmacists, medical technologists, and other allied health practitioners is the front liner in the care and management of such patients afflicted with the disease.

Methods: This descriptive cross-sectional study assessed the knowledge, attitudes, beliefs, and practices among the health workers in Makati Medical Center. A questionnaire based on the 1988 WHO Knowledge, Attitudes,

Beliefs, and Practices (KABP) of AIDS survey was used. It was sent to 307 health workers selected by cluster sampling.

Results: Based on the survey, sources of information among participants regarding HIV/AIDS were quite diverse; books and journals being the most common. The majority of the participants demonstrated satisfactory levels of awareness regarding HIV/AIDS and its mode of transmission; however, a small percentage of the respondents were found to have a misconception that there is a vaccine available for HIV/AIDS and that insect bites and sharing of utensils can transmit the virus. Some of the respondents also do not know much about transmission routes and there are a few who are not willing to care for and live with patients with HIV. The majority however have a positive attitude towards people living with HIV/AIDS.

Conclusion: Most of the respondents of this research have good knowledge regarding the disease process and its mode of transmission. At the same time, the majority of the respondents also have a positive attitude and acceptance towards people living with HIV/AIDS. The data from the study can be used to develop interventions to decrease if not eliminate HIV stigma and discrimination. Interventions can include educating health care workers by utilizing all possible modalities to have a broader reach. **(Author's abstract)**

Keywords: *HIV/AIDS, Knowledge, Attitude, Practices, Healthcare workers, Medicine*

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0248

Association between Neutrophil-To-Lymphocyte Ratio and Incidence of Contrast Induced Nephropathy among Adults Undergoing Percutaneous Coronary Intervention

Ferrer, Filoteo C. , Sarigumba, Mar

Introduction: Though the role of inflammation is reputedly associated with contrast induced nephropathy (CIN), especially in the setting of Acute Coronary Syndrome (ACS), current risk scoring systems do not address inflammatory factors. Neutrophil lymphocyte ratio (NLR), a proportion of two inflammatory markers, is reflective of the balance between innate and adaptive immune responses, and therefore has a strong predictive value.

Methods: A cross-sectional analytical study done among adult Filipinos diagnosed with ACS who underwent Percutaneous Coronary Intervention (PCI) from January to December 2018 at Makati Medical Center. Exposure of interest includes baseline NLR count and pre-procedural serum creatinine. Outcome was the incidence of CIN based on serum creatinine 24-48 hours post-procedure.

Results and Analysis: A total of 166 ACS patients were analyzed, of which 11 (6.62%) has CIN. Patients with pre-procedural NLR > 4.71 were approximately five times as likely to develop CIN (aOR 1.51 to 17.55, p = 0.009), with sensitivity 63.64%, specificity 80.65%, accuracy 79.52%, Youden's index 44.29%. On multivariate analysis, NLR and STEMI were associated with increased odds for CIN. STEMI patients had approximately four times the odds of developing CIN (aOR 3.893, 95% CI 1.07 to 14.13, p = 0.039).

Conclusion: NLR > 4.71 in Filipinos with ACS who underwent PCI is associated with increased risk to develop CIN. **(Author's abstract)**

Keywords: *Neutrophil-to-lymphocyte ratio, Contrast induced nephropathy, Percutaneous coronary intervention, Medicine*

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0249

Association of Protein-Calorie Intake and ClinicalOutcomes among Critically-ill COVID-19 Patients: A Retrospective Study

Tanchee-Ngo, Mary Jane , TaÃ±ada, Maria Regina

Background: Patients admitted due to severe COVID-19 pneumonia are at high risk for malnutrition and worsening of their clinical condition. Patients with type 2 diabetes admitted for COVID-19 pneumonia have an increased risk for poor clinical outcomes. Adequate nutrition is recommended to augment a strong immune response. The American Society of Parenteral and Enteral Nutrition (ASPEN), Philippine Society of Parenteral and Enteral Nutrition (PHILSPEN), European Society of Parenteral and Enteral Nutrition (ESPEN) recommend an energy intake goal of 15-20 kcal/kg actual body weight (ABW) per day or 70-80% of caloric requirements after the acute phase of critical illness, with recommended protein intake of 1.2-2.0 g/kg ABW per day. This study aims to provide an association between calorie and protein intake with negative clinical outcomes.

Methods: This is a retrospective cohort study of 55 mechanically ventilated SARS COV-2 RT-PCR positive patients admitted in the critical unit of Chinese General Hospital between April 1, 2020 to December 30, 2020. Clinical profile taken include: sex, age, height weight, BMI, comorbidities, and components of the modified SOFA score and APACHE II score. Calorie and protein intake from day 3 to day 7 of ICU admission were taken. Clinical outcome data were in-hospital mortality, number of days of ICU stay, hospital admission, vasopressor use and mechanical ventilation.

Results: Majority of the patients included in the study were male, elderly, overweight, and with comorbidities such as hypertension, diabetes, and chronic kidney disease. Majority of the patients were on mechanical ventilation and on vasopressors for more than 1 week. In-hospital mortality accounted for 65.5% of cases. For patients without diabetes, calorie intake was 16.9 kcal/kg/day and protein intake was 0.72 g/kg/day, while patients with diabetes had a calorie intake of 20.2 kcal/kg/day and protein intake of 0.86 g/kg/day. Based on the 70% cutoff, patients with diabetes were noted to have been provided with more adequate protein (P-value= 0.027). Higher caloric intake was inversely associated with in-hospital mortality among patients younger than 75 years old (P-value=0.026) and among patients with diabetes (P-value=0.003). Higher calorie intake was also significantly associated with decreased duration of pressors among patients with diabetes (P-value=0.021). Higher protein intake positively associated with the number of days admitted among patients with lower modified SOFA scores (P-value=0.041) and among patients with diabetes (P-value=0.021). All other associations did not display significant results (all P-values>0.05).

Conclusion: Based on this study, increased caloric intake was associated with increased survival among patients less than 75 years, but no association was found in patients 75 years and older. Among patients with lower mortality risk, increased protein intake was associated with longer duration of hospital stay, however patients with higher risk had higher in-hospital mortality regardless of protein and calorie intake. Among patients with diabetes, higher calorie intake was associated with increased survival and decreased duration of pressor requirement, while increased protein was associated with longer length of hospital stay. Treatment for COVID-19 pneumonia, however, was not established at this time and there was significant in-hospital mortality among these mechanically ventilated patients. **(Author's abstract)**

Keywords: *Protein-calorie intake, COVID-19, Outcome, Retrospective study, Mechanically ventilated, Critical care, Medicine*

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0250

A Bibliometric Analysis of the Philippine Journal of Nursing for 1966-2017

Arquiza, Glenda S. , Gallardo-Ninobla, Marina Magnolia , Tuppal, Cyruz P., Vega, Paol

The PJN has served its purpose as a venue for both Filipino and foreign nurses to publish their original articles, reflection, commentaries, and other scholarly written works on the key areas: nursing practice and nursing education. Marking its 51st year, the aim of this study was to conduct a bibliometric analysis and report publication trends of PJN for the period of 1966–2017. VOSviewer® analyzed the bibliometric characteristics of PJN using the corpus extracted from the Scopus® bibliographical database. There were 724 published documents. Among them, there were 606 original articles, 43 editorials, 22 reviews, 21 conference papers, 18 short surveys, 10 notes, and 4 letters. VOSviewer® facilitated the cluster analyses without the need to have an in-depth knowledge of clustering techniques and without requiring advanced computer skills. From this, the auto-generated themes were reviewed along with the PJN's aims/objectives such as “nursing,” “human,” 'health' “primary health care,” 'nurses” “nursing education,” and healthcare “organizations” that are apparent during the publication period between the1970s to 2010s. Various researchers both in the academic and service institutions published their works in PJN that emulate vital communication patterns in the specific fields that the journal embodies. For this reason, the authors should be instructed to list their affiliations with proper accreditation to ensure accurate publication accurate author citation history, co-authorship citations, and other bibliometric indicators. The PJN will continue to support all the researchers in the local and international community to achieve one common goal – to advance and sustain the culture of scholarship in nursing. **(Author's abstract)**

Keywords: *Bibliometric analysis, Philippine Journal of Nursing, PJN, Philippines, Medicine*

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NP

0251

Brentuximab vedotin in ALK-negative anaplastic large cell lymphoma presenting with alar mass: A Case Report

Atienza, Kevin Patrick A. , Claridad, Jose Roberto V. , Gonong, Jenni

Anaplastic large cell lymphoma (ALCL) is a rare subtype of T-cell non-Hodgkin lymphoma (NHL) primarily involving the lymph nodes; however, extra-nodal manifestations are also common. Diagnosis can be confirmed by a combination of histopathology and immunohistochemical staining. Complete workup and staging include imaging and bone marrow examination. This presents a case of a 55-year-old male with anaplastic lymphoma kinase (ALK) - negative ALCL presenting with an alar mass. ALCL patients often present with rapidly progressing lymphadenopathy. Extra-nodal manifestations commonly involve the skin, liver, lung, and gastrointestinal tract. Biopsy of the mass showed small to medium-sized anaplastic lymphoid cells that stained positive for CD30, LCA (CD45), CD99, and negative for CD20, ALK (CD246), neuron- specific enolase, CD34, CD5, PAX5, TdT, MPO, CD138, EMA, pancytokeratin, CD3 and synaptophysin. These findings were most compatible with an ALK-negative ALCL. The patient was started on a combination of brentuximab vedotin, cyclophosphamide, doxorubicin, and prednisone (BV + CHP) every 21 days for 6 cycles. There was a progressive decrease in the size of the mass, and a resolution was noted after the 5th cycle. FDG-PET/CT scan was done after the 6th cycle of chemotherapy and 6 months after completion of treatment. Both scans showed no evidence of metabolically active nodal or extra-nodal lymphomatous disease. This case showed a unique extra-nodal manifestation of an ALK-negative ALCL presenting as an alar mass with a good response to BV + CHP. However, more evidence is necessary to further establish the role of BV as the first-line treatment regimen for CD30-positive peripheral T-cell lymphoma (PTCL), including ALK- negative ALCL. **(Author's abstract)**

Keywords: *Lymphoma, Alar mass, ALCL, Anaplastic large cell lymphoma, Brentuximab vedotin, Case report, Medicine*

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0252

Capacity Needs Assessment of Primary Health Care Providers 11 in Selected Municipalities in Cavite

Tuazon, Josefina A. , Dones, Luz Barbara P. , Bonito, Sheila R. , Almoneda, I

Purpose. Primary Health Care (PHC) refers to essential health care that is made accessible, acceptable and affordable to individuals and families in the community. As such, it is imperative for PHC providers to possess the necessary competencies responsive to the current health care demands. This study aims to determine the current capacity of PHC providers and their need for capability building.

Methods. The study employed a quantitative descriptive design with 87 purposively-selected PHC providers and five administrators from selected rural municipalities in Cavite. It is adapted from the study, "Capacity-building of primary healthcare providers in 10+3 Southeast and East Asian Nursing Education and Research Network (SEANERN) countries".

Results and Discussions. The perceived level of knowledge of the PHC providers on the elements of PHC were all rated to be proficient. Maternal and child care received the highest score, while health education received the lowest score. The perceived level of skills of the PHC providers was also rated to be proficient. Sanitation and water received the highest score, while treatment of common diseases and injuries received the lowest score. Similar to the perceived levels of knowledge and skills, the perceived level of attitudes of the PHC providers were also proficient, with environmental sanitation having the highest score but treatment of common diseases and injuries having the lowest score. However, from the perspective of health administrators, they rated the PHC providers one level lower or needs minimal support. Training and capacity building in all elements of PHC was identified as the most needed by the PHC providers. Their most preferred method of training is workshop.

Conclusions. There are high perceived levels of knowledge, skills, and attitudes of the PHC providers in the elements of PHC. Despite the high scores, objective outcomes such as the MMR and immunization coverage do not reflect the proficient scores of the PHC providers. There are also other health conditions and issues such as noncommunicable diseases and injuries that need to be addressed using PHC approach. Given this, it is vital that appropriate training and adequate hiring of PHC providers be reinforced nationwide in order to meet the health goals and needs of the country. **(Author's abstract)**

Keywords: *Primary Health Care (PHC), Capacity-building, Southeast and East Asian Nursing Education and Research Network (SEANERN), Medicine*

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NP

0253

CARING AND WITNESSING IN AN URBAN POOR COMMUNITY THROUGH ENGAGED ETHNOGRAPHY AMIDST THE COVID19 PANDEMIC

Posadas, John

In this paper, I reflect on caring and witnessing through engaged ethnography of an urban poor community during the onset of the COVID19 pandemic. The urban poor are individuals and families who live below the poverty line in metropolitan areas, many of whom have little or no political voice and are insufficiently protected by social networks and other institutions.

In March 2020, the government placed Metro Manila under Enhanced Community Quarantine to control the spread of COVID19. This left many an urban poor community in Metro Manila to struggle even more against an already precarious existence. By standard, nurses render different levels of care for urban poor clients in almost all health care settings. In public health nursing, we come in close contact to the realities of our clients when we see them in health centers, in the community, or whenever we do our home visits. Now, caring for vulnerable and marginalized groups such as the urban poor has changed due to minimum public health standards of wearing masks, physical distancing, handwashing, and enforcement of lockdowns. As a nurse, an academic, and as a student of anthropology, I came up for self-review while doing an article for a popular social news network derived from a virtually engaged ethnography. While this novel method requires you to see the world through the eyes of the "other," and generates bioethical dialogue and awareness of personal biases in addressing ethical considerations and challenges, it gives voice and fulfills our roles as client advocates. In May 2020, the article was published with the urban poor organization and its partners as my co-authors. I borrowed from anthropology to arrive at a greater understanding of the socio-cultural effects and political implications of COVID19 to one of the most vulnerable nursing clientele – the urban poor. **(Author's abstract)**

Keywords: *Caring, Enculturation, Nursing education, Simulation, Mentoring, Advocacy, COVID-19, Medicine*

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0254

A Case Report of Herpes Zoster of the Trigeminal Ganglion after Coronavirus 2019 Vaccination in a 22-year-Old Male

Durano, Reden

Introduction. Herpes zoster is an acute viral syndrome caused by the reactivation of latent varicella-zoster virus from a previous infection. It is characterized by a painful, unilateral vesicular rash which is distributed over the territory of a dermatome. It is a significant global burden with the incidence very common in the Asia Pacific region. The frequency is closely related with increasing age and is the most common risk factor for reactivation of varicella-zoster virus. Herpes zoster does not often appear after administration of vaccination. But in the advent of increasing vaccinations for COVID-19, there have been reports of herpes zoster following COVID-19 vaccination.

Case: This is a case of a 22-year-old healthy male with a previous history of varicella-zoster virus infection during childhood who developed headache, unilateral vesicular rash over the territory of the left trigeminal nerve and left-sided facial pain and numbness. The patient had previously received the COVID-19 vaccine four days prior to the onset of symptoms. The diagnosis of herpes zoster was made on clinical grounds with no need for additional laboratory work-up to confirm the diagnosis. The patient was treated with herpes zoster antiviral therapy and analgesics where improvement of the patient's condition was noted with eventual crusting of the lesions and without development of complications.

Conclusion: Herpes zoster is a common disease with a benign course in immunocompetent adults. There is a need for further studies to identify risk factors and explain the possible relationship between COVID-19 vaccination and the development of herpes zoster. Due to the increasing COVID-19 vaccination of the population worldwide, there is a possibility of an increase in the number of herpes zoster cases following COVID-19 vaccination. **(Author's abstract)**

Keywords: *COVID-19, Herpes Zoster, COVID-19 vaccination, Medicine*

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0255

Characteristics of Emergency Room Visits by Older Individuals in a Tertiary Government Hospital in Nueva Ecija

Nolasco, Marjo

Background: Older individuals are more likely to utilize emergency care services than younger individuals due to the complexity of their condition. The increase in the demand for health services may lead to ER congestion, which may affect the quality of care being rendered. To the best of our knowledge, studies investigating the common medical causes of ER visits among older individuals have not been done in the Philippines.

Objectives: The study aimed to determine the characteristics of emergency room visits by older individuals in a tertiary government hospital in Nueva Ecija.

Methods: The study is a single-center, retrospective study conducted in a tertiary government hospital in Nueva Ecija. A total of 270 ER records of Internal Medicine patients aged 60 years old and above seen from June 2019 to September 2019 were included. Patients who absconded or were dead on arrival were excluded. Descriptive statistics were used for the demographic variables and the characteristics of the ER visits.

Results and Analysis: The mean age of older individuals included was 69.72 ± 7.62. The average length of stay in the ER was 3.74 ± 2.34 Hours. Majority of visits occurred during the PM shift and were urgent cases. Majority of the patients seen were self-referral and were discharged. Patients commonly presented with difficulty of breathing. Diseases of the respiratory and circulatory system predominated. Chronic obstructive pulmonary disease and pneumonia were the leading causes of ER visits.

Conclusion: Diseases of the respiratory and cardiovascular systems remain to be the leading causes of ER visits among older individuals. COPD and pneumonia were the most common diagnoses identified. Factors associated with the increase in frequency of these preventable and treatable diseases should be investigated. Older individuals often seek consultation in the ER rather than a primary health care provider. Some of the cases can be managed on an ambulatory care basis. **(Author's abstract)**

Keywords: *Emergency room visits, Geriatric, Older adults, Medicine*

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0256

Clinical Outcomes of Oral Anticoagulation and No Anticoagulation among End-Stage Renal Disease Patients on Maintenance Hemodialysis with Atrial Fibrillation: A Single-Center Prospective Cohort Study

Darunday, Grecia P. , Polito, Eratosthe

Introduction. The delicate balance of risk versus benefit of oral anticoagulation in the general population is well established but the decision to use these agents in end-stage renal disease (ESRD) remains complex and difficult

owing to the paucity of clinical trials and lack of substantial evidence in literature for its safe and effective use in the hemodialysis population. This study aims to determine the difference in clinical outcomes between oral anticoagulation and no anticoagulation therapy among ESRD patients on maintenance hemodialysis with atrial fibrillation.

Methods. This is a prospective, single-center, observational study conducted in Perpetual Succour Hospital that included all ESRD patients on maintenance hemodialysis for at least 3 months with atrial fibrillation. Out of the 188 identified patients, only 69 patients were included in the study and were grouped according to how the cardiac dysrhythmia was approached either with oral anticoagulation or no use of oral anticoagulation. Basic demographic information were obtained as well as the etiology of ESRD, CHA2DS2-VASc Score and the HAS-BLED Score. Lastly, patients were prospectively followed for a period of 12 months and were then assessed for new onset of thromboembolic events, hemorrhagic events, calciphylaxis and all-cause mortality.

Results. At enrollment, 59 (85.5%) patients were identified to have no oral anticoagulation therapy and 10 (14.5%) were already receiving oral anticoagulation. Ischemic strokes were more prevalent among patients who were on oral anticoagulant (80%, $p < 0.0001$). Patient outcomes differ significantly in terms of intracranial hemorrhage (30%, $p = 0.0004$) and gastrointestinal bleeding (50%, $p < 0.00001$) which were noted among patients on oral anticoagulation. In relation to over-all mortality, acute myocardial infarction, peripheral arterial occlusive disease and calciphylaxis, there was no significant difference between the two groups.

Conclusion. This study suggests that the use of oral anticoagulation did not prevent ischemic strokes in ESRD patients on maintenance hemodialysis with atrial fibrillation and its use was associated with increased risk for intracranial hemorrhage and gastrointestinal bleeding. There was no significant difference in relation to all-cause mortality, acute myocardial infarction, peripheral arterial occlusive disease and calciphylaxis between the two study groups. **(Author's abstract)**

Keywords: *End-Stage Renal Disease, Atrial fibrillation, Oral anticoagulation, Medicine*

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0257

Clinical Profile and Outcomes of Adult Filipino Patients with Septic Arthritis: A Descriptive Study

Yano, Mark Andr

Introduction: Septic arthritis is an infection of the joint. Considered a medical emergency, it requires prompt diagnosis and treatment. Local data on the clinical profile of septic arthritis patients in the Philippines are still limited. Therefore, this study aims to determine the clinical characteristics and outcomes of patients with septic arthritis in the local setting.

Objective: To determine the clinical profile and outcome of adult Filipino patients with septic arthritis admitted at a tertiary hospital.

Methodology: This is a retrospective descriptive study of the medical records of patients with septic arthritis admitted at Chong Hua Hospital, Cebu City, from January 2012 to December 2019.

Results: Fifty- seven patients were included in this study. Sixty-four percent were males. Forty-three percent were between the ages of 45 to 64 years old. Diabetes mellitus (49.12%) was identified as the most common comorbidity. 94% of patients presented with monoarthritis, with the knee being the most commonly involved joint (73%). 85% of patients presented with joint pain and swelling. Gram-negative bacilli were the most common pathogen isolated at 31.5%. In addition, 87% of patients had synovial fluid white blood cell counts of more than 50,000/uL. Ceftriaxone was the most commonly used empiric antibiotic (31.5%). Based on sensitivity results,

empiric antibiotic treatment was adequate in 66.67% of the cases. 64% of patients underwent surgical intervention in addition to antibiotic therapy.

Conclusion: This study highlights the unique characteristics of septic arthritis in this population, such as its prevalence in middle-aged patients and the isolation of gram-negative bacilli as the most common isolate. This study showed that the majority of patients were male, with monoarthritis as the most common presentation. Half of the studied population had diabetes mellitus. High clinical suspicion and awareness of risk factors should be emphasized so that timely and adequate treatment may be provided. **(Author's abstract)**

Keywords: *Septic arthritis, Filipino patients, Clinical profile, Medicine*

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0258

Clinical Profile and Outcomes of COVID-19 Patients with Diabetes Mellitus: A Case Series

Dampil, Oliver Allan , Santos-Caratao, Fa

COVID 19 infection has taken millions of lives to date but knowledge regarding its occurrence is still new and evolving. Among the consistent data gathered over the past few months since it was declared as a pandemic by the WHO is that patients with underlying comorbidities, notably diabetes mellitus, hypertension, and obesity have worse clinical course and outcomes. The time frame when this study was conducted was during the period when the Philippines experienced the so- called “first wave” of the coronavirus in the local setting. This was also the time when any established drug therapy for COVID-19 infection was yet to be supported by any randomized controlled trials.

Of the 12 patients enrolled in the case series, all of them had one or more underlying illnesses; the most common of which were hypertension, Vitamin D deficiency/insufficiency and cancer. Majority of the patients had an HbA1c level between 7.0%-8.0%, while an average HbA1c level of 7.5% was seen in those who expired. A greater proportion of patients (33%) were classified under obese category 1; this was followed by 25% of patients who are overweight. However, 50% of the patients who expired were morbidly obese.

Treatment regimens for both diabetes mellitus and COVID-19 were also taken into consideration. Basal plus rescue dose regimen was the most common therapy comprising 50% of the patients. Only one patient was placed on insulin drip. For COVID-19 regimen, 40% of patients received combination antiviral therapy (ritonavir/lopinavir/oseltamivir) plus hydroxychloroquine. Half of the mortality seen in this study were given the combination of antiviral plus hydroxychloroquine. Thirty-Five percent of patients eventually expired, and these were also the set of patients who were placed on renal replacement therapy, inotropic support and mechanical ventilation during the course of their illness. **(Author's Summary)**

Keywords: *Diabetes mellitus, COVID-19, Comorbidities, Clinical outcomes, Medicine*

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0259

Clinical Profile of Adult Patients with Hyperglycemic Crisis at the De La Salle University Medical Center, A Ten-Year Retrospective Study

Pagsisihan, Daveric , Agoncillo, Andre Luis, Andag-Silva, Ai

This current study aims to report the clinical profiles and characteristics of diabetic patients who had been admitted for hyperglycemic crises from 2007 to 2017 at our institution.

Methodology. We conducted a retrospective study in a tertiary care university hospital outside Metro Manila. The data gathered were divided into three categories: clinical data, biochemical data and precipitating factors.

Results. A total of 3,120 adult patients with diabetes mellitus were admitted for various reasons, and 71 cases presented with DKA or HHS over the 10-year period of review which is equivalent to 2% of all diabetes mellitus cases admitted. Forty-six (64.79%) of the patients with hyperglycemic crises were known diabetics with a duration of 7-13 years. Majority of patients were not taking anti diabetic medications upon admission. Most patients with hyperglycemic crises were tachycardic and hypertensive upon admission. Majority were discharged and improved. Majority of the cases 53 (81.69%) had DKA. The most common precipitating factor in DKA and HHS was infection.

Conclusion. In conclusion, the biochemical profiles in our series did not significantly differ from the past study by Gatbonton et.al (1998). Despite the advent of new therapies for diabetes mellitus control, mortality among the patients with hyperglycemic crises was slightly higher in our study at 11% compared to the global reported data of 2-10%. One of the reasons could be the minimal improvements in our health care delivery system that is still unable to cater to the needs of diabetic Filipinos. Early screening programs should be done for patients beginning age 40 years and even earlier for those with risk factors for prompt detection and treatment of diabetes mellitus. Education and awareness should be strengthened for patients with diabetes mellitus to avoid the crises by emphasizing the importance of regularfollow-up, monitoring and compliance with a diabetic regimen, especially with insulin and multiple OADs (oral anti-diabetic drugs) since the disease is progressive, and timely intensification of therapy is needed. **(Author's abstract)**

Keywords: *Type 2 diabetes mellitus, Hyperglycemic crisis, Oral-anti-diabetes drugs, Medicine*

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0260

Comparison of Trabecular Bone in Impacted and Normal Erupted Unilateral Maxillary Canine Teeth Using Cone-Beam Computed Tomography in Patients Scheduled for Orthodontic Treatment at the Universitas Airlangga Dental and Oral Hospital

Narmada, Ida Bagus , Adiwinarno, Bawa, Hamid, Thalca Ag

Background. Cone-beam computed tomography is being utilized in more clinical contexts and determining bone density with this method is becoming more important. Dentists, particularly dentomaxillofacial radiologists, orthodontists, and oral surgeons, must have a solid understanding of gray value. The gray values acquired from cone-beam computed tomography images are used to assess dental implant bone density, diagnose dental ankylosis, and diagnose and differentiate pathological lesions.

Objective. To determine the difference in the gray value of the trabecular bone in the impacted and normal erupted maxillary canine teeth using cone computed tomography.

Methods. We retrospectively evaluated the cone-beam computed tomography images of patients scheduled for orthodontic treatment at the Universitas Airlangga Dental and Oral Hospital. On cross-sectional cone-beam computed tomography images, the region of interest determination of 5 mm2 in the area was placed in the trabecular

bone and the gray value measurements were collected using Digital Imaging and Communications in M edicine (OnDemand3D™) dental software. The images were categorized by type of impacted canine teeth after assessing the gray values of all the teeth. Using images on the mesial, distal, buccal, and palatal areas, gray values of impacted and non-impacted teeth were compared. We used the SPSS 24 software.

Results. From a total of 13 patient radiographs, we found types I (6/13), II (6/13), and VII (1/13). The mean pixel values of impacted maxillary unilateral canine teeth were 1972.92 (mesial), 2016.55 (distal), 1990.66 (b uccal), and 1904.39 (palatal). The mean pixel values of normal erupted maxillary canines were 1754.93 (mesial), 1710.53 (distal), 1852.94 (buccal), and 1674.49 (palatal). There were significant differences between impacted and normal erupted maxillary canines: mesial (P = 0.018), distal (P = 0.000), buccal (P = 0.003), and palatal (P = 0.036).

Conclusion. There were statistically significant differences between affected and unaffected gray values in the canines in FOV size 51 × 55 mm. However, no statistically significant differences were found in the gray values in trabecular bone of unilateral maxillary impacted canines and normal erupted canines on the mesial, distal, buccal, and palatal sides. **(Author's abstract)**

Keywords: *Impacted, Canine, Trabecular bone, Maxillary, Cone-beam computed tomography, Medicine*

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0261

Compassionate Nurse: A Concept Analysis

Ferreras, Gerald

The purpose of this article is to develop a framework on fostering compassion among nurses, by examining the attributes of the concept of compassion. This concept analysis utilized the Walker and Avant Framework. A review of literature indicates that compassion in nursing remains constant throughout the years even with changes prompted by the academe, healthcare and advancement in technology. Results show the defining attributes of compassion include full acceptance of duties and responsibilities and security in workplace to develop compassion. To become compassionate, a nurse must (a) be holistically prepared, (b) experience a sense of personal and professional development, and (c) possess the initiative to fulfill patient's needs. Thus, nurses can provide quality care and prevent the occurrence of patient neglect. This concept of compassion reveals that self-awareness and security from the organization can foster compassion among nurses. **(Author's abstract)**

Keywords: *Compassionate, , Nurse, Caring, Medicine*

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0262

Complete Androgen Insensitivity in Two Filipino Siblings: A Case Report

Lim-Pacoli, Mae Rhea , De la Cruz, Alistair Kashmir C. , Ediza, Vanessa S., Chu, Alber

Androgen insensitivity syndrome is an X-linked recessive condition resulting in a failure of normal masculinization of the external genitalia in a chromosomally male individual. We describe two phenotypically female siblings aged 27 and 18 years, who presented with primary amenorrhea. The older sibling first consulted because of her desire to be pregnant while her younger sibling consulted upon the physician's advice. Clinical presentation, physical examination, hormonal and imaging studies and a male (46XY) karyotype confirmed the diagnosis of Complete Androgen Insensitivity Syndrome (AIS) in both individuals. Both of them underwent exploratory laparotomy with histopathology confirming presence of immature testicular tissue. Hormone replacement therapy was then started. Both were advised to undergo psychosocial counseling and both chose to be women. This case report is significant since there are only a few local case reports about siblings presenting with this condition. **(Case Summary)**

Keywords: *Primary Amenorrhea, Androgen Insensitivity Syndrome, Karyotyping, Medicine*

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0263

Complete Reversal of Severe Pulmonary Artery Hypertension After Antiretroviral Treatment in a 43-year-old Newly Diagnosed HIV-infected Male: A Case Report

Pepito, Gwendolyn , Robles, Jeremyjones F. , Solon, Christmae Maxine P., Olasiman, Ch

Background: Human Immunodeficiency Virus (HIV) infection can be complicated by pulmonary arterial hypertension (PAH-HIV) wherein it can occur in approximately 0.5% of HIV patients. The benefit of ART in treating PAH-HIV is unclear in this population. Data on its safety, efficacy, and effect on the progression of PAH are conflicting and limited. In this case report, improvement in PAH was noted after ART was started.

Case: A 43-year-old, male, patient with no comorbidities, consulted due to a five-month history of progressive dyspnea, body malaise as well as weight loss. The patient is heterosexual with multiple sexual partners, an injection drug user, and was previously worked up for HIV, Hepatitis B, and C with unremarkable results. Initially managed as a case of Pneumonia but on CT scan was found to have a suprahilar mass which showed chronic granulomatous features. The positive GeneXpert confirms Pulmonary Tuberculosis (PTB). However, dyspnea was noted to progress thus 2D echocardiography was done which revealed severe pulmonary arterial hypertension with normal left ventricular function. Rescreening for HIV turned out positive thus started on anti-retroviral therapy (ART) with a noted improvement of symptoms as well as improvement and eventual normalization in pulmonary artery pressure. One year after initial diagnosis, undetectable viral load for HIV and Hepatitis C were noted along with improvement in CD4 count.

Conclusion: This is a rare case of severe pulmonary hypertension as an initial presentation for HIV infection. The approach to patients with incidental PAH may include work-up for HIV especially when risk factors are present. ART treatment may provide a favorable therapeutic option if initiated early. **(Author's abstract)**

Keywords: *Pulmonary Arterial Hypertension, Human Immunodeficiency Virus, Antiretroviral Therapy, Pulmonary Tuberculosis, Case Report, Medicine*

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0264

A Concept Analysis of Role Modeling

Pugrad, Bhert Ke

Role modeling is a strategy used to teach attitudes and behaviors. It is a modality that may be consciously and unconsciously executed by the role model. This concept is used interchangeably with mentoring. Thus, requires further clarification and understanding. The Walker and Avant method was adopted as the main tool of analysis in understanding this concept. The identified antecedents of role modeling are the role of aspirants' ideals and perspectives and the role models' experiences. The attributes that have emerged are facilitating learning, embodiment, inspiring, transforming, reinforcing, connecting, and caring. The consequences are transforming, reinforcing motivation and goals, and the conception of new role models. This implies that role modeling is a cyclical and interactive process. It is continuously constructed both by the role aspirants and role models. Nurse educators, staff nurses, and managers act as the primary role model of neophyte nurses. Thus, they should remain cognizant in their practice. The way they interact with their subordinates greatly influences their role aspirants' motives and ideals, who will later assume the responsibilities of a future role model. **(Author's abstract)**

Keywords: *Role modeling, Role model, Concept analysis, Medicine*

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0265

The Concept of Nursing in the Philippines from the Perspective of Nurses in Region I

Nero, Francis

This research endeavored to explore the concept of nursing in the Philippines from the perspectives of Ilocano nurses to develop a nursing description based on the Filipino nurses' perceptions of nursing practice that will contribute to the richness of the concept of nursing in the Philippines.

The participants of the study included 16 practicing nurses in Region I (Ilocos Region) who were identified through purposive sampling based on the inclusion criteria. Using phenomenology research design, the researcher utilized in-depth semi-structured individual interviews to gather the data from 2015-2016. Collaizi's method was used in data analysis. Ethical clearance was granted by the SLU-REC with certification number 2014-013.

The findings of the study revealed four (4) major themes, which are: 1) *Mangtaraken* or Caring, 2) *Mangpasantak* or Nurturing, 3) *Mangipateg* or Valuing, and 4) *Mangsalimetmet* or Preserving. Ilocano nurses explicate the concept of nursing in the Philippines as *mangtaraken*, which is described as the art, science, and discipline of caring; *mangpasantak*, which is to nurture an individual; *mangipateg*, which pertains to valuing the individual, family, and community; and *mangsalimetmet*, which refers to the preservation of the profession, culture, and knowledge generation. The findings revealed that the meaning of nursing is culture-based which is deeply rooted in their traits as Ilocanos. **(Author's abstract)**

Keywords: *Concept of nursing, Perspective of nurses, Ilocano nurses, Region I, Ilocos Region, Medicine*

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0266

The Construction of Coping of Adults with Rheumatoid Arthritis

Uy, Moi

Purpose: People living with diseases where symptoms are not visible to the naked eye, such as Rheumatoid Arthritis (RA), are frequently misunderstood by the public and consequently face numerous conflicts in their lives. The study aims to develop an explanatory framework towards the constructions of coping of adults with rheumatoid arthritis (RA).

Design: The study made use of the Straussian Grounded Theory Method. 15 adults with ages ranging from 21 to 50 years old, diagnosed by a licensed physician with rheumatoid arthritis for at least six months at the time of the study, with an active social media account, and are in the convalescence or remission phase participated in the study. The study setting was based on the participants' preferences within the National Capital Region, Central Luzon, and Calabarzon areas. This study has been reviewed and approved by UPManila Research Ethics Board (UPMREB).

Methods: Purposive sampling and theoretical sampling were used in selecting the participants. Unstructured interviews and observation played central roles in the data collection. Consistent with the Straussian Grounded Theory method, the analysis was based on data immersion and iterative open, axial, and selective coding.

Findings: The constructions of coping in persons with Rheumatoid arthritis was presented through a "coding paradigm" of causal conditions (disconnect and invisible suffering), context (isolation and psychosocial burdens), intervening conditions (cultural values and family attitude, values, beliefs, and dynamics), strategies (joining online RA group and sticking with people who understand), and consequences (regaining control and helping others with the same condition) which were further explained in this paper.

Conclusion: The study presents experiences of persons with RA and their constructions of coping, shedding light on the often- misunderstood course of symptomatology and the struggles the afflicted persons go through. Despite having social media as the milieu by which these concepts emerge, this study's theoretical model may help health practitioners understand persons afflicted with diseases with imperceptible symptoms. Understanding their experiences in the context of the theoretical model presented could suggest information and support modalities for these groups of people. **(Author's abstract)**

Keywords: *Medicine, Rheumatoid arthritis, Invisible symptoms, Constructions of coping, Online support group (OSG)*

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0267

Convalescent Plasma Therapy in Filipino Patients with Confirmed COVID-19 Infection in a Tertiary Hospital in Cebu City: A Retrospective Cohort Single Center Study

Gargaritano, Jane Lou E. , Banquirigo, Raymond S. , Conopio, Arnel Y., Vista, Giovanni A. , Uson, Arnold Joh

Introduction: Convalescent plasma therapy (CPT) is a type of experimental passive immunotherapy with a sizable background in viral outbreaks. Although there has been documented favorable outcomes in using CPT in the treatment of viral illnesses, its use in COVID-19 is still experimental.

Objectives: To determine if adding convalescent plasma to standard of care is associated with better clinical outcomes than giving standard of care alone to severe and critical COVID-19 patients admitted in a tertiary hospital in Cebu City.

Methods: This is a retrospective cohort study conducted in a tertiary hospital in Cebu between March to

September 2020. The data of a total of 22 COVID-19 patients who received convalescent plasma therapy plus standard treatment regimen based on the institution's interim guideline were identified by chart review. The demographic information, laboratory results, management and outcome data from this group were collated, matched with and compared to 43 critically ill COVID-19 patients who received COVID-19 standard treatment regimen only.

Results: Both the CPT and non-CPT groups are comparable in terms of the socio-clinical variables, inflammatory marker levels, laboratory test results and therapeutic interventions. However, there is no relationship between the level of inflammatory markers and the illness day to which CPT was given. Additionally, the outcomes also differ significantly in terms of duration of admission, severity of illness, critical care support and mortalities. The control group has shorter hospital admissions, more patients with critical illness and more mortalities. The intervention arm, however, has more recoveries but longer duration of critical care.

Conclusion: Convalescent Plasma Therapy added to standard treatment is not associated with improved clinical outcomes among Filipino patients with severe or life-threatening COVID-19 infection admitted in a tertiary hospital in Cebu City. **(Author's abstract)**

Keywords: *COVID-19, Convalescent plasma, Outcomes, Retrospective study, Medicine*

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0268

The Correlates of Health Facility-related Stigma and Health-seeking Behaviors of People Living with HIV

Milla, Norberto E. , Tuppal, Cyruz P. , De Los Santos, Janet Ale

Objective. This study aims to assess the presence of stigma in health facilities and health-seeking behaviors of persons living with HIV (PLHIV).

Methods. This study utilized a cross-sectional design employing self-report questionnaires answered online. A total of 100 PLHIV participants were recruited using the respondent-driven sampling method.

Results. Results revealed that most participants are young adult men who have been diagnosed with HIV within the last five years. Overall, participants display moderate health-seeking behavior (M = 2.94, SD = 0.54), and moderate experience of health facility-related stigma (M = 2.21, SD = 0.87). Further, there is a negative correlation between age and health-seeking behavior (r = −0.2796, p = 0.049). The type of facility is significantly correlated with HIV stigma (r = 0.4050, p = 0.036).

Conclusion. A sustained linkage to care is essential for a PLHIV to remain engaged on his health and well-being. Necessary strategies should be implemented to improve the health-seeking behaviors of PLHIV. Public Rural Health Units are considered to be the most stigmatizing health facility. The presence of health facility-related stigma requires immediate action of the government to reinvigorate these catchment centers as providers of stigma-free and nondiscriminatory primary health care. **(Author's abstract)**

Keywords: *Human Immunodeficiency Virus, HIV, Stigma, Health facility, Health-seeking behaviors, People living with HIV, PLHIV, Philippines , Medicine*

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0269

Correlation Between Admitting Blood Glucose Levels and Hospital Outcome in Patients who Underwent Percutaneous Coronary Intervention

Duyongco-Tiu, Ma. Vircel , Damalerio, Alta Gracia B., Lagula-Bilocura, Ime

Objectives: This study aimed to determine the correlation between admitting hyperglycemia and hospital outcome, on the length of hospital stay and mortality on patients who underwent PCI.

Methodology: A single center, retrospective observational study involving patients who underwent percutaneous coronary intervention (PCI). They were divided in four (4) groups according to presence of admission hyperglycemia (capillary blood glucose >140mg/dl) and presence of diabetes: Group 1 (patients with diabetes with admission hyperglycemia), Group 2 (patients without diabetes with admission hyperglycemia), Group 3 (patients with diabetes without admission hyperglycemia), and Group 4 (patients without diabetes without admission hyperglycemia). Length of hospital stay and mortality outcome were compared between four groups and in-hospital mortality related risk factors were analyzed by binary logistic regression analysis.

Results: 133 patients were included in the analysis, of which 50% have admission hyperglycemia. The length of hospital stay was significantly longer in patients with admission hyperglycemia (12 vs 9 vs 7 vs 7 days, p= 0.006). The mortality rate between 4 groups were non-significant (14% vs 10% vs 9% vs 11%, p=0.272). Multiple logistic regression analysis showed the following were associated with increased mortality in patients who underwent PCI: age (odds ratio [OR] 1.1265, 95%CI 1.0497 – 1.2090, p=0.001), capillary blood glucose on admission (OR 1.0077, 95% CI 1.0015 – 1.0140, p= 0.015), presence of ST elevation on ECG (OR 16.5671, 95% CI 3.4161 – 80.344, p=<0.001).

Conclusion: An elevated admission capillary blood glucose, regardless of presence or absence of diabetes, was associated with longer length of hospital stay; however, it was not predictive of in-hospital mortality. Interestingly, patients with admitting hyperglycemia had earlier mortality. **(Author's abstract)**

Keywords: *Admission hyperglycemia, Capillary blood glucose, Diabetes mellitus, PCI, Medicine*

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0270

The Correlation of Ankle Brachial Index and the severity of Acute Ischemic Stroke in a Tertiary Hospital in Davao City, Philippines: A Cross-Sectional Study

Lao-Reyes, Annabelle Y. , Fernandez, Sime Raym

Introduction: Peripheral arterial disease (PAD) had been shown to have a higher likelihood of developing cardiovascular events as well as cerebrovascular accidents particularly acute ischemic stroke. However, there are limited data on the association between ankle brachial index (ABI) values and the severity of ischemic stroke. This study aimed to determine the correlation of ABI values and the severity of acute ischemic stroke in Southern Philippines Medical Center.

Methods: A prospective cross-sectional study with 112 patients diagnosed with acute ischemic stroke from June to October 2017. The ABI ratio of the subjects were obtained and correlated with the severity of stroke using National Institutes of Health Stroke Scale (NIHSS). Data analyses utilized chi-square test for categorical variables while ANOVA test for continuous variables. Spearman rho was used to determine the association between ABI

and NIHSS.

Results: Majority of patients with acute ischemic stroke had PAD with ABI ratio of ≤ 0.9 (51.8%). Using t-test, the NIHSS was significantly higher among patients with PAD having a mean score of 12.43 ± 5.29 compared to patients with normal ABI ratio having a mean score of 5.13 ± 4.09 (p= < 0.001). Furthermore, using Spearman's rho statistics, ABI ratio was negatively correlated with NIHSS score (p < 0.001).

Conclusion: Our results confirmed that there is a correlation between low ABI value and the severity of acute ischemic stroke. Routine ABI screening may help physicians intensify treatment strategies for those high-risk patients to prevent future events. **(Author's abstract)**

Keywords: *Peripheral arterial disease, Ankle brachial index, Stroke, Medicine*

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0271

COVID-19: UNMASKING DISPARITIES AND INEQUITIES IN HEALTH

Javison, Sherwynn

Health care should be borderless, and people must have liberty and timely access to health services regardless of color and status. Different cultures appear to interconnect the world but threaten conflict because of how public health policies are implemented. Considering the social determinants of health in public health policy is essential to halt the following disparities and inequities in this pandemic: (a) compromised right to education has been linked to poverty and without a regular income, disease conditions aggravate, even worse; (b) due to labor market segregation, people in color were losing jobs at a high rate than whites- these minorities have least to cope on health and economic fall-out of the pandemic; (c) racial residential segregation has forced minorities to live in unconducive substandard multifamily units; (d) due to food insufficiency related to joblessness, over 21,000 homeless people may need to be hospitalized; (e) Because of the wrong perceptions of the disease, the whites intently discriminate against the East Asian ethnicity for fear of contracting COVID-19; (f) social media has influenced the development and spread of health-related 'conspiracy' and people became resistant to public health policies; (g) telehealth is advantageous in population with excellent internet service but not for the homeless and those living in depressed areas; (h) urbanization has led to climate change, biodiversity loss, which arises in zoonotic transmission/diseases; (i) pollution was associated with a 15% increase in the COVID-19 death rate in California; and, (j) populations living in coldest areas are at risk of contracting COVID-19 virus. This study unveils racial inequities and disparities in COVID-19. **(Author's abstract)**

Keywords: *COVID-19, Public health, Social determinants, Health disparities, Health inequities, Pandemic, Medicine*

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0272

The Creation and Maintenance of a Hospital-Based Cancer Registry System

Viray, Ethel Dominique E. , Tiangco, Beatrice J., Parma,

Introduction: Cancer registries contain information essential to any rational program of evidence-based cancer control, including cancer epidemiology and outcomes, and can be site-specific, hospital-based, or population-based. The creation of a national population-based cancer registry and hospital-based cancer registries was mandated in the National Cancer Control Act of 2019. This paper reports on the creation and maintenance of the Cancer CARE Registry and Research Philippines (CARE PH) app, the country's first hospital-based cancer registry system, and its future directions in registry and research.

Methods: A cancer registry in the form of a web-based application was developed through the collaboration between a clinician and a health information technology specialist. This registry was designed to follow the cancer patient's journey from diagnosis to staging to treatment and cure, relapse, or progression into death. Patient information is collected in a structured and secure process from designated catchment areas in each hospital by trained tumor registrars, with the main catchment area being the hospital's Surgical Pathology department. The CARE PH application is given to member hospitals for free through the support of grants given to the CARE PH Foundation, Inc.

Results and discussion: Today, 31 member hospitals in the CARE PH system have recorded a collective total of 9,880 new cancer patients for the year 2020. The most common cancer types recorded in CARE PH for 2020 include breast, colorectal, cervical, and head and neck cancers. In addition, the registry captures a myriad of information that can potentially answer questions relevant to the individual cancer patient and clinicians, and hospital administrators.

Conclusion: HBCRs are an indispensable part of effective cancer control programs as they facilitate making evidence- based decisions that would result in better healthcare for Filipino cancer patients. **(Author's abstract)**

Keywords: *Philippines, Cancer, Cancer registry, Epidemiology, Medicine*

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0273

Cross-cultural Visayan Translation and Validation of Beck's Depression Inventory Scale Among Ambulatory Maintenance Hemodialysis at a Tertiary Training Hospital in Southern Mindanao, Philippines (BDI-VISAYAN)

Oco, Marius , Bersales-Masendo, Arnelia , Dimaano, Exequiel P., Pingoy,

Research Question: Is Beck's Depression Inventory Scale – Visayan (BDI-Visayan) an accurate and reliable depression screening tool among ambulatory hemodialysis patients validated against Semi-structured Clinical Interview for Depression for DSM IV?

Background: Depressed dialysis patients are twice likely to die or require hospitalization. Unfortunately, there is a lack of a depression screening tool validated for Filipino patients.

Objectives: Development and validation of Beck's Depression Inventory Scale -Visayan version as a depression screening tool for ambulatory maintenance hemodialysis Filipino patients.

General Study Design: This is a cross-cultural instrument translation and cross-sectional validation study.

Participants: Using non-probability convenient sampling, patients >18years old with eGFR <60mL/min/1.73m2 based on CKD-Epi equation and on hemodialysis for ≥3 months were enrolled. Patients with hearing, speech or cognitive deficits, acute kidney injury, dementia, delirium or psychiatric disorders were excluded.

Interventions: BDI Visayan was developed using combined translation technique with depression defined as a score of ≥14.

Outcome measures: Structured Clinical Interview for Depression (SCID) for DSM IV was used as the gold standard.

Analysis: Sensitivity, specificity, predictive values, and likelihood ratios of BDI-Visayan were compared to SCID. Cronbach's alpha, Receiver Operator Characteristics and Area Under the Curve were used to determine reliability, optimal cut-off score, and overall accuracy, respectively.

Results: BDI-Visayan has high reliability with Cronbach's alpha of 0.904 and an accuracy of 0.80 AUC. The optimal cut-off for BDI-Visayan for major depressive disorder for ambulatory hemodialysis patients is 20 with 75% sensitivity, 55% specificity, 22% positive predictive value, 93% negative predictive value, 3.92 positive likelihood ratio, and 0.31 negative likelihood ratio.

Conclusions: BDI Visayan is a reliable and accurate depression screening tool for ambulatory maintenance hemodialysis Filipino patients with higher specificity at an optimum cut-off score of 20. **(Author's abstract)**

Keywords: *Structured Clinical Interview for Depression (SCID), Chronic kidney disease (CKD), Hemodialysis, Medicine*

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0274

Cross-Sectional Study on the Profiles and the Degree of Burnout among Resident Physicians in Private Tertiary Hospitals in Bacolod City: Proposed Life-Skills Program

Baker, Glenda Leslie T. , Espinosa, Wend

Research question: What are the profiles and the degree of burnout among resident physicians in private tertiary hospitals in Bacolod City?

Background: Exhaustion from work may result into negative effects not only to the medical staff and patients. Systematic reviews revealed an association in physician burnout and suboptimal quality of care, patient safety and patient satisfaction. However, the prevalence of burnout among resident physicians in Bacolod City has not been established.

Objectives: The study aimed to determine the profiles and the degree of burnout among resident physicians in private tertiary hospitals in Bacolod City.

Study design: Cross-sectional survey

Participants: We invited all resident physicians in private hospitals in Bacolod City.

Outcome measure: This study used the 22-item Maslach Burnout Inventory-Human Services Survey.

Analysis: IBM SPSS version 22 was used in the data analysis. Mean and frequency distribution were utilized. Analysis of percentage of distribution was used to determine their difference.

Results: From December 2019 to January 2020, ninety-three resident physicians consented to participate in the study. The majority of the participants were young adults, females and single. Only a minority of the residents exercised regularly. The majority were practicing their religion. Most of the residents are in their early years of training. Residents in Internal Medicine comprised the majority of the respondents. Among the respondents, in the Emotional Exhaustion (EE) domain: 24.7% were low, 37.6% were moderate, and 37.6% were high. While in the Depersonalization (DP) domain: 43% were low, 34.4% were moderate, and 22.6% were high. Lastly, in the

Personal Achievement (PA) domain: 33.3% were low, 35.5% were moderate, and 31.2% were high. High burnout was present in 22.6% among the respondents.

Conclusions: High burn out was seen among young adults, male, single, and more senior resident physicians. Furthermore, residents who exercise regularly and practice their religion have lower burnout. And Internal Medicine residents were seen to have high burnout compared to other training specialization. Organizational- and physician-directed interventions have an essential role in preventing and reducing burnout in training institutions. **(Author's abstract)**

Keywords: *Resident physicians, Burnout, Stress, Private hospitals, Medicine*

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0275

CULTIVATING CARING BEHAVIORS IN NURSING ACADEMIA DURING THE COVID-19 PANDEMIC

Torres, Gian Carlo S. , Tabudlo, Jer

The imposition of community quarantine due to COVID-19 transformed nursing campuses from traditional teaching and learning to flexible learning and distance teaching. The shift in the approach is a big challenge because teaching caring behaviors often require face-to-face patient interactions. This research note presents teaching and learning strategies in cultivating caring behaviors in nursing academia during the COVID-19 pandemic. Journals articles were read to identify teaching and learning strategies in cultivating caring behaviors. Strategies identified include simulation-based learning, advocacy, professional mentoring, and service-learning. Nursing is caring; despite the limitations posed by this pandemic, there are available teaching and learning strategies to cultivate caring behaviors. Considering the current context, flexibility, sensibility, and equity in teaching and learning should be of prime concern. **(Author's abstract)**

Keywords: *Caring, Enculturation, Nursing education, Simulation, Mentoring, Advocacy, COVID-19, Medicine*

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0276

Cultural Adaptation and Validation of The CaSPUN (Cancer Survivors' Partners Unmet Needs) Measure Among Partners of Gynecological Cancers

Besral , Afiyanti, Yati , Haryani, H

Purpose: The partners of cancer patients commonly provide the needs of cancer patients along cancer trajectory except for patients with gynecological cancer. In developing countries including Indonesia, who have strong family bonding, the family of cancer patients are involved more intensely in providing cancer care. This situation may bring the cancer patients' families experience the burden and decrease their quality of life. Therefore, assessing the family's supportive needs are as important as patient supportive needs. There are more gynecological cancer survivors in Indonesia; however, little is recognized about partners' supportive needs due to lack of validated assessment tools to measure it. This study aimed to translate, culturally adapted and test the validity and reliability of the CaSPUN questionnaire among partner of Indonesia gynecological cancer patients.

Design: First, the procedures of forward-backward translation and modification of the CaSPUN were conducted to ensure cultural adaptation. Second, using convenience sampling with 295 partners of gynecological cancer patients, we tested the construct validity and internal consistency of the CaSPUN-Indonesia Version (CaSPUN-I). We conducted Exploratory Factor Analysis to explore the factor structure of CaSPUN-I and Cronbach Alpha to confirm internal consistency reliability.

Results: The CaSPUN were modified to make more understandable and culturally appropriate in the Indonesian context. Five factors were extracted from EFAin the CaSPUN-I with factor loadings of items between 0.41 and 0.85. The Cronbach's alpha coefficient for the CaSPUN-I ranged from 0.96-0.97.

Conclusion: The CaSPUN Indonesia version presents acceptable validity and reliability for assessing supportive care needs among families of Indonesian gynecological cancer patients. The CaSPUN-I can be used by healthcare providers to assess and design the supportive care program for family of Indonesia gynecological cancer patients. **(Author's abstract)**

Keywords: *CaSPUN, Cancer survivor, Cross-cultural adaption, Indonesia, Needs assessment, Medicine*

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0277

Culturally Competent Interprofessional Pediatric Care: A Concept Analysis

Antwi, Fiskvik Bo

The American Academy of Pediatrics describes culturally effective care in a policy statement as the provision of care in the sense of appropriate provider awareness, understanding, and appreciation of cultural differences that contribute to optimal health outcomes. Therefore, clinicians must develop cultural competence to enhance patients' care satisfaction and outcome. Although culturally effective pediatric care has been discussed in the literature, there remains a gap in the process on how an interprofessional health care team can provide culturally congruent care in a pediatric setting. Being part of an interprofessional pediatric care team, nurses hold the responsibility of communication and coordination to ensure culturally competent care by every member of the health care team. Hence, this paper adapts Walker and Avant's (2011) concept analysis process in which the theory, culturally competent pediatric care would be derived. The concept analysis methodology from Walker and Avant (2011) would define the concept, attributes, antecedents, consequences, and cases that would describe culturally competent pediatric care. Cultural diversity and family dynamics are ever-changing. The concept analysis proposes a framework for culturally competent interprofessional care in which culturally competent care is an ongoing team approach. Ultimately, the concept concluded that to provide culturally competent care in pediatric practice, there should be a framework in which the interprofessional team follows, using the principle of cultural humility and illustrating cross-cultural communication to provide culturally appropriate care. **(Author's abstract)**

Keywords: *Culturally competent care, Pediatric practice, Interprofessional health care team, Medicine*

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0278

Definition and Conceptualization of Collaboration in Drug Rehabilitation: Systematic Synthesis and Comparison Using a Scoping Review Approach

Li, Chi Mei Jessica , Antonio, Carl Abela

Objective. Although interagency collaboration in drug treatment and rehabilitation has been substantially studied, a lack of consensus on the nomenclature and definition of collaboration remains an unresolved issue in public health policy and practice. To facilitate further consensus, this review analyses previously used definition, conceptualization, and theorization on interagency collaboration in the field of drug rehabilitation.

Methods. We conducted evidence synthesis using a scoping review approach. This review is based on searches using the MEDLINE, CINAHL Complete, Embase, and PsychINFO databases and used the protocol proposed by Arksey and O'Malley.

Results. A total of 6,259 papers were retrieved from database and citation searches, 33 of which were eligible for inclusion in the analysis after screening and evaluation. Although the definitions varied, the common elements included (a) the presence of at least two entities, which were either services, programs or organizations; (b) these entities collaborated or shared resources; (c) partnership went through a development process; and (d) the intent of collaboration was to achieve a common purpose. There were five means of conceptualizing collaboration: (a) degrees, or level of intensity and formality; (b) elements, or the constitutive structure and activities; (c) stages, or the development of partnership over time; (d) levels, or the focus of the collaborative; and (e) type, or a distinction between collaboration on in policy and practice.

Conclusion. Scholarship in this field can benefit from studies that conceptualize collaboration not only crosssectionally through the description of degrees, elements, levels, and type, but also by considering the stages dimension of collaboration (i.e., evolution of collaboration initiative over time). Countries or jurisdictions may need to formalize a term and definition for collaboration as it applies to initiatives within their territories. **(Author's abstract)**

Keywords: *Intersectoral collaboration, Substance-related disorders/therapy, Substance abuse treatment centres, Review, Medicine*

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0279

Degree Of Burnout and Its Association with Depression, Anxiety and Stress Among Health Care Workers in a Tertiary Hospital in Mandaue City During The COVID-19 Pandemic

Robles, Jeremyjones F. , Baring, Neil Christian D., Ezpeleta, Jr., Raul

Background: On top of adjusting to the societal shifts and emotional stressors faced by everyone, health care workers are also confronted by stressors such as an increased risk of exposure, extreme workloads, moral dilemmas, and a dynamic practice environment that differs greatly from what was familiar. These can lead to burnout, a state of physical, emotional, and mental exhaustion that results from long-term involvement in work situations that are emotionally demanding.

General Objective: This is a descriptive cross-sectional study that intends to measure the degree of burnout and determine its association with depression, anxiety, and stress among health care workers in Chong Hua Hospital Mandaue during the COVID-19 pandemic.

Methodology: The data collection process entailed the researchers' physical and online administration of a questionnaire which included the health care workers' socio-demographic data and questions lifted from both the Copenhagen Burnout Inventory (CBI) and Depression, Anxiety, Stress Scales (DASS) 42-item. Also included

was an open-ended questionnaire to enumerate outbreak-specific contributors to burnout.

Results: 222 health care workers were surveyed. Almost half (98, 44.2%) of the health care workers registered moderate to high overall burnout scores on the CBI but none of them had severe burnout. The degree of burnout was determined to be moderately associated with all three negative emotional states using the Cramer's V coefficient: depression (V = .448), anxiety (V = .378), and stress (V = .415). The foremost factor identified to be a contributor to burnout was the high workload which was exacerbated by the onset of the pandemic.

Conclusion: The study showed that burnout and the negative psychological states of depression, anxiety, and stress, are prevalent in health care providers with results comparable to other global studies. The contributors to burnout identified by the respondents were either present pre-pandemic but were aggravated by it and those which were outbreak-specific. **(Author's abstract)**

Keywords: *Burnout, COVID-19, Depression, Anxiety, Stress, Medicine*

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0280

Detection of Epithelial Giant Cells in Nasal Aspirate Cytological Smears Using Deep Learning and Computer Vision Techniques: an Approach for Early Diagnosis of Measles Disease

Shenoy, Rathika D. , Nayak, Sneha , B.H., Karthik Pai , Rao, Abhis

Measles disease is usually diagnosed through an RT-PCR test, which detects the measles-specific IgM antibody in serum samples. However, this approach is highly expensive and requires a lot of sample preprocessing making it a laborious task. Another approach for measles identification could be a cytological smear test – which is a low-cost, quick, and accurate method for the early detection of measles disease. Due to the lack of experience in interpreting smears, its usage in clinical practice is currently limited. We have designed a MesoSpot, an automatic segmentation method for the first time that can precisely define the region of giant cells in nasal aspirate cytological smears and assist medical experts in the speedy diagnosis of measles disease. MesoSpot was developed by training 500 cytological smear images collected from various web sources. We have used 50 cytological smear images to validate the model and evaluated its performance using various metrics. The main purpose of the proposed study is to detect multinucleated giant cells and estimate their size and number, which aids in assessing the disease's severity. To annotate the giant cells in each cytological smear, we have applied a semantic segmentation approach using APEER software. UNET architecture was used to train the model, and image processing techniques were used to spot giant cells and predict their size. Various performance metrics were employed to assess the model's efficiency. The model's output was also compared to the ground truth image and statistically confirmed. **(Author's abstract)**

Keywords: *Epithelial giant cells, Cytological smears, Measles disease, Semantic segmentation, Deep learning, Computer vision, Medicine*

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0281

Developing a Professional Identity in Nursing through Reflection

Co-Enarsico, Charma

Professional identity is the nurse's collection of beliefs about what it “means to be” and to “act like” a nurse. This represents his/her “philosophy of nursing” and it has a direct influence on how actual “roles and responsibilities” are followed. In other words, professional identity is the “foundational reference” in the nurse's cognitive process to which decisions are being made. Moreover, these are the values and beliefs held by the nurse as guiding principles in thinking, behaving, acting, communicating, and interacting with patients, the patient's family, and other members of the healthcare team.

As a practical science, nursing education has introduced the importance of reflective learning in the clinical setting when providing care to patients and in building nurse-patient relationships. This means that there is a developing awareness of assisting, encouraging, and teaching both students and professional nurses to become thoughtful individuals, capable of critical thinking and analogy to come up with innovative ideas. Reflection in this mode of instruction is considered as a tool for the analysis of nursing practice nurturing both the understanding of professional nursing and the building of important thoughtful approaches essential for providing nursing care in multifaceted and dynamic working conditions. As a result, reflection, as an instructional method, has been included in many nursing curricula.

However, the concept of reflection within the context of developing a professional identity has scarcely been defined to adequately identify research and educational indicators. This concept analysis aims to describe attributes, antecedents, and consequences of reflection in the development of professional identity in nursing and to provide clear evidence for nursing educators/faculty that support the systematic development of professional nurses as they advance in practice from the undergraduate to the graduate programs. **(Author's abstract)**

Keywords: *Reflection, Professional Identity, Professional Nursing, Medicine*

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0282

Development and Effect of the Online HIV Prevention and Care Training (HPCT) Program for Student Nurses

Aranil-Palencia, Conchita , de Leon, Rose Zuzette M. , De Torres, Ryan Q., Adajar, Gracielle Rut

Student nurses must be competently prepared to address the rising human immunodeficiency virus (HIV) epidemic in the Philippines. This article presents the development and effect of the online HIV Prevention and Care Training (HPCT) program for student nurses. The Iowa Model-Revised guided the development of the program. Literature review, student and faculty engagements, advocate participation, resources and protocol assessment, and pre-HPCT survey analysis were systematically performed to determine the contents and delivery of the program. The participants were 2nd and 3rd year level student nurses who were asked to answer the pre- and post-HPCT online surveys containing sociodemographic, HIV knowledge, attitudes, and perceived practices, and program evaluation questionnaires. Descriptive and inferential statistics were performed using SPSS version 23. Student nurses in the post-HPCTsurvey obtained significantly higher HIV knowledge scale mean scores (mean=18.22, SD=4.138) than those in the pre-HPCT survey (mean=15.01, SD=4.069) (p=.000). Pre- to post-HPCT survey revealed significant decreases in the proportions of student nurses who agreed on the following: HIV-positive patients should not be put in rooms with other patients when admitted to hospital (44.3%, 31.6%; p=.004); the need to worry about putting family and friends at risk of contracting the disease when caring for a person with HIV/AIDS (39.7%, 26.4%; p=.002); and healthcare workers are worried of getting HIV/AIDS from caring for a person with HIV/AIDS in their work environment (47.2%, 37.5%; p=.011). Significantly, more student nurses in the post-HPCT survey agreed in all the items of the HIV practice scale than those in the pre-HPCT survey. The online HPCTprogram was acceptable with beneficial effects on student nurses' HIV

knowledge, attitudes, and perceived practices. There is a need to highlight basic HIV concepts and integrate HIV developments in the education of student nurses. **(Author's abstract)**

Keywords: *Evidence-based nursing, HIV, Program development, Student nurses, Online learning, Medicine*

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NP

0283

Diabetes Knowledge Among Patients with Type 2 Diabetes at the University of Santo Tomas Hospital Using the Filipino Version of Michigan Diabetes Knowledge Test (Filipino-DKT)

Gomez, Maria Honolina S. , Gomez, Ma. Felisse Car

Background: A well-informed patient with Type 2 diabetes may be more compliant with treatment. This study aims to evaluate the diabetes-related knowledge and socio-demographic determinants of patients seen at University of Santo Tomas Hospital through a translated and validated Filipino–DKT questionnaire.

Methods: Standard translation procedure was used to produce the Filipino version of the DKT2. A convenience sample of 112 outpatients with Type 2 diabetes was identified for six months at the University of Santo Tomas Hospital, Philippines. All data were collected using the Filipino-DKT and a demographic questionnaire.

Results: The Filipino-DKT demonstrated an acceptable Cronbach's alpha of 0.70 and an acceptable average inter-item correlation of 0.40 ($p<0.001$). The test-retest reliability was excellent, with a Pearson coefficient r of 1.00 ($p<0.001$). Our study demonstrated that of the 112 patients with diabetes who answered the general knowledge test, the majority had average knowledge of 78.64%, while 16.07% had poor knowledge. A total of 55 participants on insulin answered the second part of Filipino-DKT that measures insulin knowledge. Surprisingly, 56% of the subjects on insulin had poor knowledge, and only 7% had good knowledge. Results showed that the majority (56%) had poor knowledge. Participants who reported poor control of their diabetes (HbA1c >7%) also reported lower levels of knowledge about diabetes and insulin use. There was no association between duration of diabetes, family history of diabetes, and type of diabetes with knowledge of diabetes.

Conclusion: The Filipino diabetic knowledge of diabetes is poor and not related to age, sex, and duration of diabetes. Filipino-DKT is an acceptable, reliable, and valid measure of diabetes knowledge used in our clinical practice and research. **(Author's abstract)**

Keywords: *Diabetes Knowledge, Translation, Validation, Medicine*

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NP

0284

Diabetes Self-Management Education Program (DSME) among Adolescents with Type 1 Diabetes Mellitus

De Leon, Anjanette S. , Trinidad, Catherine Mae G. , Robles, Sofia Magdalena N. , Mejilla, Joylyn L. , De Leon, Josephine M. , Urgel, Elv

The DSME program is aimed to educate adolescents about diabetes mellitus: disease process, survival skills, exercise management, drug management, diet management, prevent acute and chronic complications and optimize quality of life. This study utilized the quasi experimental pre and post-test design involving 15 adolescent patients with Type 1 Diabetes Mellitus. The DSME materials were composed of five modules that included topics in diabetes awareness, survival skills, exercise, drug and diet management. Knowledge, Fasting Blood Sugar (FBS), Random Blood Sugar (RBS) and waist and hip ratio (WHR) were tested. The Intervention phase was implemented in three months where each module was completed by patients in two weeks. Pre and post-test examinations were done after each module. Participants have very satisfactory knowledge in diabetes awareness, survival skills, exercise, drug management before and after the DSME program. However, participants knowledge in diet management were unsatisfactory before and after the DSME program. FBS were high but RBS levels and WHR were in normal levels before, during and after the DSME program. Knowledge scores were significantly different before and after the implementation of all the modules (Module 1 to Module 5) to the participants. RBS results were significantly different after the implementation of the Module 1- DM awareness and Module 5- diet management. However, no significant differences were obtained in the RBS results of the participants after the implementation of Module 2, 3, 4, and 5. No significant differences were also obtained in the WHR parameters of the participants in each of the implementation of DSME. No significant differences in the FBS results were obtained after the implementation of the DSME modules. The module type DSME is effective in increasing knowledge of the adolescent patients in diabetes and its management. The content of the diet management module needs to be strengthened and be tested again for its effectiveness in increasing knowledge of adolescent patients. **(Author's abstract)**

Keywords: *Diabetes Management Self Education, Diabetes Type 1, Diabetes Mellitus, Medicine*

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NP

0285

The Diagnosis, Treatment, and Outcomes of Filipinos with Marfan Syndrome

Carandang, Ralph Laurence A. , Lazo, Reynaldo C. , Toledano, Bryan Rene F., Macapagal, Rami

Introduction: Marfan syndrome is an autosomal dominant disorder of connective tissue that results from abnormal fibrillin- 1. It is caused by a mutation in the FBN1 gene making it a multisystemic disease. It is the most common but may have overlap with other thoracic aortic syndromes. It is primarily diagnosed using the 2010 revised Ghent nosology criteria that rely on the presence of family history, progressive aortic root dilatation or dissection, ectopia lentis, genetic testing, and systemic features. Unfortunately, a lack of nationwide awareness, family history, and medical access may lead to delayed diagnosis and treatment in our setting.

Case Summary: We report 4 cases of Marfan Syndrome from May to October 2019, which were seen at our institution. They presented with either recently diagnosed aortic aneurysm, dissection, or severe heart failure. We used the Revised Ghent Nosology for diagnosis and treated them with the standard of care. However, outcomes were different across patients.

Discussion: The life expectancy is comparable to the general population If early diagnosis is achieved. A myriad of known cardiovascular complications can manifest from severe valvular heart disease secondary to mitral valve prolapse, aortic root dilatation, and, most commonly, aortic dissection.

Conclusion: A late diagnosis presenting as aortic dissection or severe valvular heart disease may have a poor quality of life and prognosis. A thoracic aortic syndrome, most commonly Marfan, should still be considered in patients with aortic criterion and premature aortic syndrome even if a systemic score of 7 is not fulfilled. The screening of first-degree relatives of affected patients is an effective strategy to diagnose them at an early stage where they are still asymptomatic. **(Author's abstract)**

Keywords: *Marfan case series, Premature Aortic Disease, Thoracic aortic syndromes, Medicine*

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NP

0286

Diagnostic Accuracy of Serum 1,5-anhydroglucitol as a Surrogate Measure of Glycemic Variability Among Adult Filipinos with Type 2 Diabetes Mellitus: A Retrospective Cross-sectional Study

Cheng, Christian Bernard T. , Tabora, Joebeth S. , Lee, Ainee Krystelle C., Sy, Rosa A

Background: Among the various glycemic indices in current use, glycemic variability has the greatest contribution in the development of microvascular and macrovascular complications in Type 2 Diabetes mellitus (T2DM). Most metrics that are currently used to measure glycemic variability are derived from continuous glucose monitoring (CGM) data. However, CGM is burdensome to the patient due to its relatively high cost as well as the need for multiple visits with the health care provider. With the use of serum 1,5-anhydroglucitol (1,5-AG) as a biomarker of glucose fluctuations, physicians and patients alike could have an easier surrogate measure of glycemic variability thus aiding in achieving target glucose control. This study aims to determine the diagnostic accuracy of 1,5-AG as compared to the glycemic variability metrics derived from CGM as a surrogate measure of glycemic variability among adult Filipinos with T2DM.

Methods: Retrospective analysis of data of adult patients aged 20 years old and above diagnosed with T2DM referred for CGM at the Diabetes, Endocrine, Metabolic, and Nutrition Center of Cardinal Santos Medical Center from January 2017 to October 2021 who underwent serum 1,5-AG level determination within 2 weeks of CGM were collected. Diagnostic accuracy was obtained by computing the sensitivity, specificity, positive (PPV) and negative predictive values (NPV), and Youden index. Pearson correlation coefficient was used to determine the correlation of 1,5-AG and the different metrics. Analysis of variance (ANOVA) was used to check for statistical significance with 99% confidence interval and a $p < 0.05$ considered as statistically significant.

Results: This study involving 37 subjects showed a good diagnostic accuracy of serum 1,5-AG levels with the different measures of glycemic variability derived from CGM namely mean amplitude of glycemic excursion (MAGE), continuous overlapping net glycemic action at 1-hour intervals (CONGA-1), and mean of daily differences (MODD) with significant correlation among patients with HbA1c ≤ 7%. Subjects were on CGM for approximately 6 ± 1 day with statistically significant difference between the good and poor glucose control group ($p<0.05$). Determination of diagnostic accuracy between 1,5- AG and MAGE showed good accuracy (Sensitivity = 95.3%, Specificity = 100%, PPV = 100%, NPV = 75.43%, Diagnostic accuracy 96%, and a Youden Index of 92.3) with a statistically significant correlation among subjects with HbA1c level ≤ 7% ($p=0.021$). There is likewise good diagnostic accuracy between CONGA-1 and 1,5-AG level (Sensitivity = 99%, Specificity = 75.29%, PPV = 89.1%, NPV = 97%, Accuracy = 89.50% and Youden index of 58.41) with a statistically significant correlation among subjects with HbA1c ≤ 7% ($p=0.038$). Comparison with interday glycemic variability showed fair diagnostic accuracy between MODD and 1,5-AG (Sensitivity = 79.17%, Specificity = 78%, PPV = 97%, NPV = 32%, Accuracy = 76.89%, and Youden index of 49.07) and a statistically significant correlation among subjects with HbA1c ≤ 7% ($p=0.009$).

Conclusion: There is good diagnostic accuracy of serum 1,5-AG levels with the different measures of glycemic variability derived from CGM namely MAGE, CONGA-1, and MODD with significant correlation among patients with HbA1c ≤ 7%. Among diabetics with HbA1c ≤7%, 1,5-AG could be used as a surrogate measure of glycemic variability and excursions. **(Author's abstract)**

Keywords: *Serum 1,5-anhydroglucitol, Continuous glucose monitoring, Type 2 diabetes mellitus, Medicine*

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0287

Diagnostic Dilemma: A Case Report on Primary Peritoneal Carcinoma in a Patient with Suspected Ovarian Malignancy

Remotigue, Carmela Rosanne A. , Robles, Jeremy Jones F. , Cercado, Gerald

Introduction. Primary peritoneal carcinoma (PPC) is an uncommon malignancy and is often misdiagnosed as peritoneal carcinomatosis from metastatic gastrointestinal carcinoma and more frequently from ovarian carcinomas due to a common embryonic origin of the ovary and the peritoneum. Its diagnosis is a challenge for clinicians. Herein, we report a rare case of PPC in a 72-year-old woman who was initially suspected with metastatic ovarian malignancy, and emphasizes points that help differentiate PPC from primary ovarian cancer.

Case. This a case of a 72-year-old female with abdominal discomfort and distension, initially diagnosed with ovarian carcinoma, with abdominal CT scan revealing thickening of the omentum multiple enhancing nodules in the left adnexa, within the pouch of Douglas and subdiaphragmatic region compatible with malignancy such as metastases from carcinoma. Cancer antigen (CA) 125 (3476 u/mL) and CA 15-3 (45.94 u/mL) were elevated. The patient underwent dilation and curettage and diagnostic laparoscopy and biopsy with frozen section, which revealed metastatic clear cell adenocarcinoma, favoring primary ovarian carcinoma. The patient then underwent exploratory laparotomy, total abdominal hysterectomy, bilateral salpingo-oophorectomy with bilateral lymph node dissection, and omentectomy. Further histopathological findings later confirmed that the patient had carcinoma primarily from the peritoneum instead of from the ovary. The patient was discharged, improved and underwent chemotherapy post-operation.

Conclusion. This report emphasizes how to distinguish primary malignancy from the peritoneum from that in the ovary, preventing misdiagnosis. The emphasis in considering primary peritoneal cancer as a differential diagnosis in patients with abdominal symptoms suspected due to malignancy should be noted. **(Author's abstract)**

Keywords: *Primary peritoneal carcinoma, Ovarian cancer, Peritoneal carcinomatosis, Case report, Medicine*

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0288

The Dynamic Care Nurse

Labarinto,

Virginia Henderson defined that the primary role of nurses for individuals, whether sick or well, is to assist them in regaining their health and promoting their independence in activities of daily living (Halloran, 2018). The gap that is noted in the definition of Henderson's role of nurses is the lack of direction as to how will a nurse render care that is unique and satisfying to an individual, knowing that the demand of expectation rises. Thus, it motivated this paper to study the concept of the dynamic care nurse. This concept paper utilized Walker and Avant (2005) method of analysis. The attributes associated with the dynamic care nurse are (1) continuous learning; and (2) the utilization of best practices. The antecedents identified include (1) initiative, and (2) compassion (ICN, 2012, Hemberg et al., 2020, Kroning, et al., 2019). Dynamic care nurse exemplifies the attributes of continuous learning and the utilization of best practices. Nurses can bridge the gaps in the practice through these attributes and by possessing initiative and compassion, it is not by afar to achieve a better health care service and positive health outcomes. **(Author's abstract)**

Keywords: *Dynamic, Dynamic care nurse, Best practices, Continuous learning, Nursing care, Compassion, Initiative, Quality care, Medicine*

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0289

Effect of health education on mother's knowledge to the length of hospital stay of children with pneumonia in Jakarta

Waluyanti, Fajar Tri , Nurhaeni, Dr. Nani , Casma

Purpose: Pneumonia is the most common reason for parents to send their children for hospitalization. Currently, parents still lack knowledge on the proper management of sick children during hospitalization. It causes longer stay of children with pneumonia. This study aimed to identify the effects of giving health education through video and leaflet on mother's knowledge and their children's length of stay in three general hospitals in Jakarta region.

Methods: This study was a quasi-experimental study with pretest and posttest nonequivalent control group design. Health education was given to 64 mothers, 32 of them received it through video, while the other 32 received it through a leaflet. All respondents received health education in three days since their children were admitted. Data was collected through a self-reported questionnaire. Wilcoxon, Mann-Whitney, and t-Test were used for data analysis.

Result: This study showed mother's knowledge increased in both groups, however, the median difference of pretest-posttest on video group was higher than the leaflet one. Median difference value in video group was 8, and for leaflet group was 6 ($p<.001$). Children's length of stay in the video group was shorter than those in the leaflet group ($p<.001$).

Conclusions: Health education through video has a higher impact on increasing mother's knowledge and decreasing children's length of stay as compared through the use of leaflets. **(Author's abstract)**

Keywords: *Children, Health education, Length of stay, Mother\'s knowledge, Pneumonia, Medicine*

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0290

The Effect of Smoking in the Development of Stroke in Young Patients 19 to 45 Years Old: A Case-Control Study

De Asis Bernardo, Fritz Rinaldi , Fernandez, Marc Laurence L. , Manongas, Ken , Bautista, Cherie

Introduction: The increasing incidence of stroke in young adults has been a growing concern, which is why research studies were generated to find out the risk factors contributing to the development of this disease. This study investigated the dose-dependent effect of smoking in the development of stroke in the young ages (19-45 years).

Methods: A case-control retrospective study was conducted using electronic and printed records of the patients

admitted to Amang Rodriguez Memorial Medical Center last 2017-2018. There were 275 patients included in the study. The smoking status and pack-years cigarette smoking of the subjects were recorded and were correlated with the duration of hospitalization and the Modified Rankin Scale (MRS). Results were analyzed using student's t-test, ANOVA, and Pearson's Correlation.

Result: The prevalence of stroke was higher in men than in women. The ORs (95% CI) of stroke were significant in current cigarette smoking at 2.71 (CI: 1.6398 to 4.4943). Compared with non-smokers and those who smoked 1 to 9 pack years, the OR of stroke was significantly increased for those who smoked 10 to 19, and ≥ 20 cigarettes per day with OR of 14.0765 (4.10 to 48.35), and 31.5854 (1.82 to 548.97), respectively (p= 0.032 for linear trends). There was a weak positive linear correlation between pack years of cigarette smoking (1-9, 10-19, >20 pack years) and days of hospitalization (r= 0.28; p for trend = 0.0168). There was also a strong positive linear correlation between stroke outcome using the Modified Rankin Scale and pack years of cigarette smoking (r = 0.72; P for trend = 0.001). This study shows an increase in the odds of stroke in current cigarette smokers with a dose-dependent relationship in its outcome.

Conclusion: Smoking is a significant risk factor for stroke with a dose-dependent effect on its outcome. Furthermore, quitting smoking significantly decreases the risk of developing stroke. **(Author's abstract)**

Keywords: *Stroke, Pack Years Cigarette Smoking, Modified Rankin Scale, Case-Control, Retrospective, Pearson Correlation, Medicine*

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0291

Effect of Smoking on the Estimated Glomerular Filtration Rate of Chronic Kidney Disease Patient Prior to Dialysis Initiation

Manongas, Ken P. , Larang, Chernob

Introduction. Smoking is prevalent among Filipinos, but little is known about whether this is associated with the rapid decline of the renal function among patients with existing chronic kidney disease (CKD). The purpose of this study is to investigate whether or not there is a direct relationship of smoking to the progression of CKD requiring patient to be on dialysis/renal replacement therapy.

Methods. A cross-sectional, retrospective study design was used. All CKD 5D patients of the Amang Rodriguez Memorial Medical Center (ARMMC) Hemodialysis (HD) Unit in the month of July to August, 2019 were included, if they are > 18yo, regardless of their co-morbidities. Excluded are those with acute kidney injury (AKI), and iatrogenic, surgical or trauma complications that cause renal dysfunction. Charts were reviewed and 55 patients qualified. Smoking status were grouped according to the US Centers for Disease Control (CDC) smoking definitions, either never, former and current smoker. Estimated glomerular filtration rate (eGFR) Creatinine were computed using the CKD-Epi formula 3-yr, 2-yr, 1-yr and 0-yr prior to HD. The main outcome measure was whether and what among the smoking status hastens the progression of CKD. Descriptive statistical analyses were done along with one-way variance, two-way variance, and chi-square.

Results. Most of the smokers were males (p < 0.001). Most of the participants had diabetes as the primary illness. All of the participants had same endpoint of having eGFR < 15 at the time of dialysis initiation. There was a significant progressive decrease from eGFR3 to eGFR0 in all smoking status. Current smokers have the highest significant reduction in eGFR (p < 0.001).

Conclusion. Smoking hastens the progression of CKD among Filipinos. With that, we support the smoking cessation campaign of the ARMMC and the DOH. In addition, further work up is suggested to determine the primary mechanistic pathway of smoking that affects the renal cells. **(Author's abstract)**

Keywords: *Chronic Kidney Disease, Smoking Status, eGFR, Medicine*

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0292

Effectiveness and Safety of Therapeutic Plasma Exchange as an Adjunctive Treatment for Coronavirus Disease 2019 (COVID-19) Patients: A Systematic Review

Mesina, Flordeluna Z. , Julian, Jomell C. , Sy, Charles Er

Rationale: COVID-19 is a new, rapidly emerging zoonotic infectious disease. Addressing the cytokine storm and coagulopathy associated with this disease can minimize its severity and complications. Therapeutic plasma exchange (TPE) can be potentially used to remove these deleterious cytokines and procoagulant proteins.

Objective: This study aims to assess the effectiveness and safety of TPE as an adjunctive treatment for COVID-19 patients.

Research Design and Methodology: A systematic search of databases was conducted utilizing PubMed and Cochrane databases to identify relevant literature until December 31, 2020. All publications were included if they use TPE in COVID- 19 patients. The exclusion was applied in publications written in language other than English, review papers, or on-going clinical trials. No restrictions on age, sex, or clinical setting were applied. The eligible studies were reviewed in full text independently by two authors. Methodological quality and risk of bias assessment were done. The findings from the individual studies were summarized.

Results: A total of 21 studies were included. Overall risk of bias was high within and across the studies. All studies reported marked improvement of clinical status and laboratory results after receiving the TPE. The use of TPE among COVID-19 patients resulted in no serious or life-threatening adverse events.

Conclusion: The available studies on the use of TPE for COVID-19 patients is still limited and evidence is of low certainty. However, based on the available data, it has an encouraging result to be used as effective and safe adjunctive treatment in COVID-19 patients. **(Author's abstract)**

Keywords: *Therapeutic plasma exchange, COVID-19, Cytokine storm, Coagulopathy, Medicine*

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0293

Effectiveness of the Otago Exercise Programme in falls reduction among community-dwelling older people in Southeast Asia: A systematic review

Husaini, Hjh Asmah Haji , Johar, Amal Azimah Haji , Teo, Shy

Background: Falls are common in older people and a leading cause of injury. Exercise programmes are available for falls prevention, including the Otago Exercise Programme (OEP). The Southeast Asia region has a rapidly ageing population with unique aspects to consider in falls prevention. This systematic review aims to explore the effectiveness of OEP in Southeast Asia for falls prevention.

Methods: A literature search conducted in April 2020 of PubMed and Google Scholar databases was performed

to identify randomised controlled trials on OEP in Southeast Asia.

Results: Three studies met inclusion criteria for the systematic review. The studies in Malaysia and Thailand did not identify any differences in the rate of falls with the modified OEP intervention compared to conventional treatment. The study from Indonesia inferred a reduced fall risk with improved Timed Up and Go with the intervention, but did not quantify fall rates.

Conclusion: The three studies identified used a modified OEP, with limited evidence of efficacy or reduction in fall rates. Further research is required, particularly randomized controlled trials to evaluate OEP for falls prevention in Southeast Asia. **(Author's abstract)**

Keywords: *Medicine*

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0294

Effects of a Self-determination Theory-Based Intervention on CPAP Treatment of Patients with Obstructive Sleep Apnea

Cura, Jonathan D. , Felipe, Rey Jo

Purpose. With continuous positive airway pressure (CPAP) being the treatment of choice for Obstructive Sleep Apnea (OSA), adherence rates to CPAP are still low without a clear consensus of causes. The Self-Determination Theory (SDT) is a general theory of human motivation that emphasizes the extent to which behaviors are relatively autonomous based on the psychological needs that are critical to supporting the process of internalization and the development of optimal motivation. This study sought to determine whether the implementation of an SDT-based intervention is effective in improving: (1) perceived competence, (2) treatment self-regulation, (3) CPAP treatment adherence, and (4) Apnea–hypopnea index (AHI) of OSA patients.

Methods. Using a true experimental pretest-posttest design, 30 purposively selected participants were randomly allocated to experimental and control groups. The SDT-based intervention included group sessions, individual sessions, and follow up phone calls in three weeks. Written permission to conduct the study was obtained from the Institutional Review Board of the University of the East - Ramon Magsaysay Memorial Medical Center, Inc. (UERMMMCI) and the Lung Center of the Philippines. Participation was voluntary and all participants had the right to refuse or discontinue their participation at any time during the study. Data were analyzed using two- way repeated-measures ANOVA, student's T-test, and chi-square.

Results and Conclusion. The participants in the experimental group have increased adherence rates from Time 1 (60%) to Time 2 (92.9%) and Time 3 (85.7%). Although, when compared to the control group, no significant difference was noted across the different periods of measurement (p=0.70810, p=0870, p=0.2403). There were higher proportions of patients who eventually became adherent in the experimental group compared to the control group immediately after and 5 weeks after the intervention (p=0.0001). The experimental group had significantly better improvement in AHI compared to the control group immediately after (p=0.0152) and 5 weeks after the intervention (p=0.0022). Considering the importance of CPAP adherence in effectively treating OSA, measures to improve adherence such as SDT-based intervention could be usefully incorporated into OSA patients' treatment plans. **(Author's abstract)**

Keywords: *Obstructive Sleep Apnea, Continuous Positive Airway Pressure, Adherence, Self-determination Theory, Medicine*

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0295

Effects of Dynamic Jumping Exercise on Vascular Function, Physical Performance, and Quality of Life in Middle-aged with Prehypertension

Sawanyawisuth, Kittisak , Janyacharoen, Taweesak , Donpunha, Wanida , Nakmareong, Saowanee , Boonsong, W

This study aimed to investigate the effects of home-based dynamic jumping exercise (DJE) in middle-aged with prehypertension. Sedentary individuals were recruited from Banphai district, Khon Kaen, Thailand. Thirty (30) eligible subjects were randomly allocated to the control (CG) and exercise (EX) groups. The CG was instructed about lifestyle modification, and the EX was asked to act like the CG but additionally elongated with DJE program for 8 wk (50 min/day, 3 d/wk at moderate intensity). The primary outcomes were systolic (SBP) and diastolic blood pressure (DBP). There are four secondary outcomes – including carotid-femoral pulse wave velocity (cfPWV), five times sit-to-stand test (FTSST), timed up and go test (TUGT), and quality of life (QOL). After the 8-wk program, the EX significantly improved in all outcomes from baseline ($p < 0.001$) except TUGT ($p = 0.07$) and QOL. On the other hand, the environmental domain of QOL significantly decreased ($p < 0.05$) in the CG from baseline. However, significant differences were found in SBP, DBP, FTSST, and TUGT between the groups except for cfPWV ($p = 0.06$). In conclusion, the DJE program in combination with lifestyle modification was considered a non-pharmacological intervention for controlling blood pressure and improving physical performance in middle-aged adults with prehypertension. **(Author's abstract)**

Keywords: *Exercise, Hypertension, Blood pressure, Physical performance, Medicine*

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0296

Efficacy and Safety of Corticosteroid Administration in Moderate to Severe COVID-19: A Meta-analysis

Mendoza, Clarissa M. , Bantolo, Alena Pias , Talamayan, Erika Xandra N. , Talamayan, Erika Xan

Background. Adding to the current available evidence on the efficacy of exogenous corticosteroids as an adjunct to standard of care in improving the clinical outcomes of COVID-19 patients. This meta-analysis examined the experimental and clinical data supporting this therapeutic intervention in improving clinical outcomes.

Objectives. This meta-analysis aimed to assess the efficacy of corticosteroids in improving outcomes in COVID-19 patients.

Search methods. Literature searches of electronic databases (PubMed, Cochrane Library, Science Direct, Google Scholar) were performed to identify relevant studies.

Data Collection and Analysis. Meta-analysis was performed using Review Manager (RevMan) software, version 5.4.1. Intervention effects were expressed in terms of mean differences and risk ratios for continuous and dichotomous variables, respectively. Fixed-effect or random-effects model was adopted according to heterogeneity.

Main Results. A total of seven studies were included in the quantitative synthesis. Analysis of pooled data showed a 12% reduced risk of mortality in COVID patients given corticosteroids (RR 0.88, 95% CI 0.81 to 0.95). Patients

who were administered with corticosteroids also had 22% decreased risk of requiring invasive ventilation support (RR 0.78, 95% CI 0.64 to 0.95). Number of adverse events were similar between the two groups (RR 1.10, 95% CI 0.49 to 2.46).

Conclusion. Adjunct corticosteroid therapy provided improvements in clinical outcomes such as decreased deaths and decreased need for invasive ventilation support. There was no sufficient evidence of a significant adverse effect, hence it **is** relatively safe and beneficial to use in COVID19 patients. **(Author's abstract)**

Keywords: *Corticosteroids, COVID-19, Meta-analysis, Clinical outcomes, Medicine*

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0297

The Efficacy and Safety of *Emblica officinalis* Aqueous Fruit Extract among Adult Patients with Dyslipidemia: A Systematic Review and Meta-analys

AÃ±onuevo-Cruz, Ma. Cecile S. , Arcellana, Anna Elvira S. , Larrazabal, Jr., Ramon B. , Chiu, Harold Henrison C. , Acampado, Laura Rosa

Background. Flavonoids from *Emblica officinalis* effectively reduced serum and tissue lipid levels throu gh their inhibitory effect on the hepatic β-hydroxy-β-methylglutaryl coenzyme A reductase activity. This study aimed to determine the efficacy and safety of *E. officinalis* extract in adults with dyslipidemia.

Methods. We searched the following electronic databases: MEDLINE (PubMed), MEDLINE (Ovid), Google Scholar, EMBASE, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Web of Science, and Clinical Trials.gov from inception until January 31, 2022. Two reviewers independently screened the abstracts, reviewed full-text papers, and critically appraised the quality of included studies. Meta-analysis was performed using the random-effects model. Our primary outcomes were total cholesterol, LDL-C, serum triglycerides, and HDL-C levels, while secondary outcomes included adverse events.

Results. A total of four randomized trials (N = 227) were included in the final analysis. There were statistically significant decreases in total cholesterol levels (SMD = -21.23 mg/dL, 95% CI: -34.22, -8.25; P = 0.001) and LDL-C levels (SMD = -25.12 mg/dL, 95% CI: -40.24, -10.00; P = 0.001) and significant increase in HDL-C levels (SMD = 4.74 mg/dL, 95% CI: 0.40, 9.07; P = 0.03) after 12 weeks of intervention favoring the use of the Emblica extract over placebo. However, there were no statistically significant difference in the serum triglycerides levels following 12 weeks of treatment (SMD = -22.28 mg/dL, 95% CI: -53.33, 8.76; P = 0.16). There was high heterogeneity noted across all outcomes: total cholesterol (P = 0.01, I^2 = 72%), LDL-C (P = 0.0004, I^2 = 83%), HDL-C (P < 0.00001, I^2 = 91%) and serum triglycerides (P < 0.00001, I^2 = 93 %). The intervention was well tolerated and adverse events reported in the three of four studies were all mild: dyspepsia (7 events – treatment), mild diarrhea (3 events – placebo), fever (1 event – placebo), headache (1 event – placebo).

Conclusion. Compared to placebo, *Emblica officinalis* fruit extract resulted in lower total cholesterol and LDL-C levels and increased HDL-C levels but with no effect on serum triglyceride levels based on low certainty of evidence. Trials with a larger sample size that directly compare *E. officinalis* extract to statins, preferably local data, are needed to support its use in patients with dyslipidemia further. **(Author's abstract)**

Keywords: *Dyslipidemia, Emblica officinalis, Phyllanthus emblica, Meta-analysis, Medicine*

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NP

0298

Emerging Utility of Endovascular Thrombectomy in the Philippines: A Single-center Clinical Experience

Soliven, Jo Ann R. , Constantino, Glenn Anthony A., SeÃ±ga, Miguela Marie A. , Jocson, Victor Erwin

Background and Objective. Stroke has remained one of the primary causes of significant morbidity and mortality. Among the therapeutic options for acute stroke management, endovascular thrombectomy is intended to remove the thrombi within the intracerebral vasculature and restore adequate perfusion to the surrounding penumbra. It is recommended up to 24 hours from onset of neurologic symptom. In the Philippines, only a few tertiary healthcare institutions are able to offer and perform endovascular thrombectomies. The aim was to describe the profile and discharge outcomes of endovascular thrombectomy for acute ischemic stroke at a tertiary hospital in our country.

Methods. We conducted a retrospective records review among 924 patients admitted for acute ischemic stroke from October 2018 to August 2021 who underwent mechanical thrombectomy. Clinical and functional outcomes were measured using the National Institutes of Health Stroke Scale (NIHSS) and Modified Rankin Score (mRS).

Results. Among 31 patients included in the study, 29 subjects (93.5%) had moderate to severe disability (mRS 3â€“5), and 25 (80.6%) had moderate stroke (NIHSS 6â€“21) on admission. The identified site of the cerebrovascular thrombi was within the M1 segment of the middle cerebral artery (41.9%, n=13). The stent retriever approach was performed in 19 participants (61.2%). Upon discharge, only 7 (22.6%) had favorable functional outcomes (MRS 0â€“2), and 9 (29.0%) resulted in mortality. Successful reperfusion was achieved in 92.3% of the patients.

Conclusion. Overall, endovascular thrombectomy is a possible treatment option for large vessel acute ischemic stroke in developing countries. **(Author's abstract)**

Keywords: *Thrombectomy, Endovascular procedures, Ischemic stroke, Treatment outcomes, Medicine*

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0299

Work Environment and Workload of Staff Nurses in Level 2 Hospitals at Cavite, Philippines

Javier, W

One of the greatest healthcare challenges for today's generation is the improvement of the nursing work environment. Despite the challenges brought by the unhealthy working environment and high workload demand, Filipino nurses stood up high in maintaining professionalism towards their work. The goal of this study is to determine the relationship between the work environment and the workload of staff nurses in level 2 hospitals in Cavite, Philippines. Quantitative non-experimental descriptive correlational design was used, and the standardized questionnaires namely: Practice Environment Scale of the Nursing Work Index (PES-NWI) and NASA Task Load Index (NASA-TLX) were used to gather data from 70 respondents. Results showed that majority were female, belonging to Millennial age (23-38 years old), had baccalaureate degree in Nursing, with a gross monthly salary of Php 15,000.00- 19,999.00, being in the institution for more than 6 months to 5 years, and have an average nurse to patient ratio of 11.30. Their level of work environment was favorable in all subscales with a composite score of 3.13 (SD= 0.570). Their perceived workload was high, with a mean score of 71.24 (SD= 12.78). Likewise,

nurse to patient ratio had a significant relationship with nurse manager ability, leadership, and support of nurses (X2= 94.26, p= <.001) and staffing and resource adequacy (X2= 75.06, p= 0.002). Moreover, significant relationships among the variables of age and physical demand (p= .004), length of institutional experience and physical demand (p <0.001), educational attainment and performance (p= .018), educational attainment and effort (p= .005), and length of institutional experience and effort (p= .001). Last, there is no statistically significant correlation between the overall work environment and the overall workload of nurses (r= -.084, p= .491). These findings underscore the importance of measures aimed at enhancing the work environment and workload of staff nurses to prevent further challenges among them. **(Author's abstract)**

Keywords: *Work environment, Workload, PES-NWI, NASA-TLX, Staff nurses, Medicine*

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NP

0300

Evaluation of Urine L-FABP Point of Care Kit in the Philippines as Predictive Marker of Clinical Severity of COVID-19 (EPOCH COVID study)

Uichanco, Ann Celestyn , Lee, Nica , Chan, Erika , Pasilan, Renz , Chua, Eric , Beltran, Kay , Solante, Rontgene , Gomez, Lynn , Chua, Alberto, Diego, Micaela San , Danasen, Abe

Background: The search for simple clinical and laboratory markers to help predict the clinical severity of patients presenting with COVID-19 has prompted this study to look at the predictive value of urine L-FABP (Liver Type-Fatty Acid Binding Protein) point-of-care test kit at the initial presentation of COVID-19 patients to the hospital.

Methods: The validation study prospectively included 109 consecutive patients with mild to moderate COVID-19, mean age of 52.2 years (range 19-84) presenting at the Emergency Rooms of 4 participating Metro-Manila hospitals from February to April 2021, with available data for analysis for 103 patients. Urine L-FABP POC (Point-of-Care) test and other clinical parameters and the level of severity of COVID-19 were determined at Day 0, Day 4 and Day 7. Computations for Sensitivity, Specificity, Positive and Negative Predictive values and Likelihood ratios were performed

Results: Twenty-three patients tested positive for urine L-FABP, out of the 103 patients analyzed, while 80 tested negative. Of the 23 patients who tested positive for urine L-FABP, 6 has progressed in severity, while 17 did not progressed. Of the 80 patients who tested negative for urine L-FABP, 13 progressed, while 67 did not progressed in severity. Giving a Sensitivity of 31.58%, Specificity of 79.76%, Positive predictive value of 26.09%, Negative predictive value of 83.75%. Combining urine L-FABP and initial clinical parameters like SIRS (Systemic Inflammatory Response Syndrome) criteria to predict progression of severity yielded a higher Specificity of 91.67 % and Negative Predictive value of 84.62%.

Conclusions: The study shows the utility of initial urine L-FABP POC test as a negative screening test in triaging adult patients presenting to the ER with mild to moderate COVID-19. Patients at the ER with a negative urine L-FABP test, will most likely not progressed to severe COVID-19. Combining clinical parameters like SIRS Criteria with the urine L-FABP result can increase the negative predictive value. **(Author's abstract)**

Keywords: *COVID-19, Urine L-FABP POC (Point-of-Care) test, SIRS Criteria, Medicine*

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0301

Evidence-Based Practices in Mentoring Student Nurses in Clinical Placement: A Meta-Analysis

Bascos, Mark

Purpose: Mentoring is an essential variable in the learning process of student nurses. This study aimed to identify effective mentoring practices in the clinical placement of student nurses.

Design and methods: Systematic review and meta-analysis were conducted. The main databases used were PubMed, Cochrane Central Register of Controlled Trials, JBI Database of Systematic Reviews and Implementation Reports, CINAHL, and Medline. The risk of bias was assessed utilizing the JBI appraisal tool. The data were summarized and statistically analyzed using the Comprehensive Meta-Analysis version 3.0 software.

Results: Out of 17,946 records screened, six studies met the inclusion criteria. Peer and nurse-led mentoring practices were reported to have positive outcomes in the students' clinical placement. Meta-analysis revealed a statistically significant effect of mentoring in the students' clinical placement (SMD 0.357, 95% CI 0.038, 0.677, I2 = 69.26%, p = 0.028). A subgroup analysis resulted in a statistically significant effect of mentoring by nurses and peers in the improvement of students' knowledge and skills (SMD = 0.426, 95% CI, 0.202, 0.650, I2 = 0%, p = 0.000).

Conclusions: Mentoring can positively influence the interaction between a conducive clinical learning environment and positive learning outcomes. Specifically, this meta-analysis suggests that student nurses can benefit from peer and nurse-led mentoring in improving knowledge and skills. It is suggested that effective mentoring practices be utilized to inform the development of a student mentoring program. **(Author's abstract)**

Keywords: *Mentoring, Students, Clinical placement, Meta-analysis, Medicine*

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0302

Executive Summary of the 2020 Clinical Practice Guidelines for Sepsis and Septic Shock in Adults in the Philippines

Ang, Blake Warren C. , Albay, Jr., Albert B. , Ambrocio, Gene Phillip Louie C. , Villanueva, Anthony Russell T. , Tomacruz, Isabelle Dominique V. , Ramirez, Bryan Paul G. , Dela Torre, Krishja T. , Sandejas, Joanne Carmela M. , Salamat, Maria Sonia S. , Sala, Sebar S. , Quitos, Leonell Albert L. , Limos, Honey Jane B. , Montecillo, Monica Pia R. , Henson, Karl Evans R. , Abad, Cybele Lara R. , Santos, Maria Clariza M. , Quero, Anne Kristine H. , Lucero, Josephine Anne C. , Dumagay, Teresita E. , Razon-Gonzalez, Elvie Victonette B. , Lawenko, Rona Marie A. , Bernardino, Joyce B. , Urbanozo-Corpuz, Hannah C. , Nacpil-Dominguez, Paulette D. , Gaerlan, Faith Joan M. , Manalo, Christopher G. , Robles, Joanne B. , Pantaleon, Anthony F. , Hernandez, Aaron Mark R. , Briones, Jr., Gerardo M. , Sanchez-Tolosa, Maria Teresa F. , Punzalan, Felix Eduardo R. , Maramara, MarieKirk Patrich A. , Magno, Jose Donato A. , Aherrera, Jaime Alfonso M. , Malundo, Anna Flor Gaboy , Buensalido, Joseph Adrian L., Chua, Jamie R. , Jaen, Anjuli Mae P. , Magallanes, Jonray R. , Tan, Irene Rosellen P. , Zamora, Mithi Kalayaan S. , Alejandria, Marissa M. , De losReyes, Mari Ros

Sepsis is thought to affect over 30 million individuals all over the world annually, and puts at risk of death some six million of these people. The incidence of sepsis throughout the world had been reported to be 22 to 240 cases per 100,000 persons using the old sepsis definition. In February 2016, the Sepsis-3 definitions drastically changed the paradigm for sepsis. This 2020 Clinical Practice Guideline (CPG) adopted the new definitions and the latest

evidence on sepsis and septic shock to (1) establish the definition and clinical criteria to be used in the Philippines, (2) present evidence-based recommendations with regard to screening, diagnosis, treatment, and prognostication of sepsis and septic shock in immunocompetent adults, and (3) aimed to reduce practice variability among healthcare practitioners and improve clinical outcomes in patients with sepsis and septic shock. The preparation of the guideline was spearheaded by the Steering Committee who selected the members of the multidisciplinary Technical Working Group (TWG) and the Consensus Panel. The TWG, composed of experts across various fields and specialties, conducted a comprehensive review of evidence relevant to each guideline question. The Consensus Panel consisted of different stakeholders who voted for the recommendations. The GRADE (Grades of Recommendation, Assessment, Development and Evaluation) Approach was used to determine the quality of evidence and guide the strength of recommendations. Publication of this CPG is part of the dissemination process, which will be followed later on by monitoring and updating. **(Author's summary)**

Keywords: *Sepsis, Septic shock, Guideline, Definition, Criteria, Diagnosis, Treatment, Medicine*

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NP

0303

Factors affecting mental health outcomes of healthcare workers at Cardinal Santos Medical Center during the Coronavirus Disease (COVID-19) pandemic

Molina, Marc Conrad C. , Sy, Rosa Allyn G. , Apa-ap, Archime

Background. Studies show that healthcare workers from previous pandemics have experienced high levels of stress, anxiety with negative psychological impacts. This paper aims to identify factors affecting mental health outcomes of healthcare workers during Coronavirus Disease (COVID-19) pandemic.

Methods. A cross-sectional design was used to determine factors affecting mental health outcome of healthcare workers with direct contact to patients with COVID-19. Depression, anxiety and distress were measured by the nine-item Patient Health Questionnaire, seven-item Generalized Anxiety Disorder scale, and 22-item Impact of Event Scale–Revised, respectively. Binomial multiple logistic regression model was used to identify the factors associated with mental health outcome.

Results. 172 healthcare workers were included. Prevalence of depression, anxiety and distress symptoms among all healthcare workers were 57%, 47.7%, 65.1%, respectively. Age and living with a family with comorbidities are significantly associated with depression and anxiety. Healthcare workers aged 31 years and above are 70% less likely to have depression symptoms (OR 0.278, CI 95%, 0.11-0.72 p=0.008 and OR 0.273, CI 95%, 0.12-0.61, p=0.002). Those living with relatives with comorbidities are 2.7 times more likely to experience depression symptoms (OR 2.731, CI 95%, 1.36-5.5, p=0.005). Healthcare workers age 31-40 years has 80% less likely to experience anxiety symptoms (OR 0.212, CI 95%, 0.09-0.5, p<0.001), and those age 41 and above have 73% less likely to have anxiety symptoms (OR 0.37, CI 95%, 0.14-0.98, p<0.045). Those living with relatives with comorbidities are 2.9 times more likely to have anxiety symptoms (OR 2.889, CI 95%, 1.46- 5.73, p=0.002). Level of knowledge on COVID-19 among health care workers significantly differs across severity but has no significant association with prevalence of depression. No factors were associated with distress symptom.

Conclusion. Cognizant of high rates of depression, anxiety and distress among our younger healthcare workers living with relatives with comorbidities will be a challenge to establish and/or improve existing programs to promote and address mental health needs. Psychological stress can accumulate over time and have an impact later in the outbreak which should be investigated in future studies. **(Author's abstract)**

Keywords: *Mental health outcomes, Healthcare workers, COVID-19, Medicine*

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0304

Factors Affecting the Outcome of Adult Patients with Methicillin-resistant *Staphylococcus aureus* and Non-Methicillin resistant *Staphylococcus aureus* pneumonia: A Retrospective, Cross-sectional Cohort Study

Obillo, Froilan Jacinto R. , Manongas, Ken P. , Yap, Mari

Introduction: Pneumonia continues to be a leading cause of morbidity and mortality worldwide. Locally, pneumonia is the 3rd cause of death (2016). Currently, one of the concerns is the rise of resistant microorganisms particularly MRSA. Knowledge regarding MRSA pneumonia is mostly from international data.

This study aims to determine the factors that may affect the outcome of MRSA and non-MRSA pneumonia as well as describethe susceptibility patterns of its etiologic agents.

Methods: This is a retrospective, cross-sectional cohort study. The setting is a tertiary government hospital. The target subjects are patients 18 y/o and above, with bacteriologically-confirmed pneumonia, and were admitted in 2017.

Results: The results revealed a high rate of MRSA pneumonia (88.2%), most are community-acquired (90%), and factors associated with mortality were: male, Type 2 DM, smoking history, radiographic findings of congestion, and atheromatous/tortuous aorta. For hospital length of stay, no significant difference was noted. For Non-MRSA pneumonia factors associated with mortality were: erythrocytosis, kidney and liver disease, cancer, previous cerebrovascular disease, previous admission (ARMMC), number of comorbidities, findings of altered sensorium, chest retractions, DBP $\leq$ 60 mmHg, radiographic findings of pulmonary congestion, and classification of CAP-MR. Morbidity factors included: anemia, trauma, multiple comorbidities, radiographic findings of bilateral infiltrates, unilateral/bilateral consolidation, unilateral/bilateral minimal pleural effusion, subcutaneous emphysema, congestion, and infection with multiple bacteria.

The first antibiogram for the institution revealed a poor susceptibility pattern for the usually used empiric treatment.

Conclusion: This study reveals a high rate of MRSA pneumonia, with several factors associated with its mortality. In terms of morbidity, no significant difference was noted from the variables measured. For Non-MRSA pneumonia which is seen in the majority of the subjects, several factors associated with mortality were noted and unlike MRSA pneumonia the morbidity is affected by the presence of anemia, trauma, multiple comorbidities, etc.

The antibiogram showed a poor susceptibility to the usually used empiric treatment. **(Author's abstract)**

Keywords: *MRSA pneumonia, Empiric treatment, Clinical outcomes, Medicine*

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0305

Factors Affecting Voluntary Blood Donations among Adults in Metro Manila, Philippines, as a Basis for Policy Improvement on Donor Recruitment

Utanes, Beatrice Ysabel G. , Clemente, Benjie M. , Dulay, Daphne Cherlott T. , Mancita, Sophia Catherine A. , Alican, Chloie Anne L. , Mappala, Arnold Christ

Background. Blood donation practice in the Philippines is low despite numerous efforts to recruit potential donors and increase blood supply.

Objectives. This study aimed to explore the sociodemographic profile of potential donors and their perceived level of knowledge, motivators, and hindrances on blood donation practice to recommend improvements in policies and strategies regarding blood donation recruitment.

Methods. A descriptive study design was utilized to attain the objectives of the study. A piloted questionnaire was floated through various social media platforms to gather data. Data were analyzed using descriptive statistics and Pearson's product-moment correlation.

Results. We included 260 Metro Manila residents, 18 to 65 years old and without conditions that merited permanent
deferral in blood donation. Overall, the respondents had an adequate perceived level of knowledge (xÌ„ = 3.13, SD = 0.70) on blood donation but the lowest level of knowledge on the interval between successive blood donations (xÌ„ = 2.71, SD = 1.04). Furthermore, respondents were considerably motivated to donate blood (xÌ„ = 2.67, SD = 0.42) mainly due to relatives and friends requiring blood (xÌ„ = 3.73, SD = 0.60), and have minimal discernment of being discouraged from blood donation (xÌ„ = 2.09, SD = 0.48) mainly due to time constraints (xÌ„ = 3.23, SD = 0.78). Moreover, there is a significant but low inverse correlation (r = -0.151, p = 0.015) between age and motivation, suggesting younger individuals have more motivation to donate blood. Thus, policies and strategies that target young donors are highly suggested.

Conclusion. Poor blood donation practices in the Philippines suggest recalibration of policies and strategies by targeting young individuals and showcasing altruism to improve donor recruitment. Moreover, it is recommended to strategically establish blood service facilities in accessible areas with flexible operating hours to accommodate potential donors with hectic schedules. **(Author's abstract)**

Keywords: *Blood donation, Philippines, Donor recruitment, Medicine*

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0306

Factors Associated with Length of Stay in the Emergency Department: A Narrative review

Rasmussen, Philippa , Kusumawati, Happy Indah, Judy Magar

Background: Increasing demand and complex procedures may associate with the length of stay (LOS) in the Emergency Department (ED). Prolonged LOS may decrease the quality of ED care and increase patient harm. Therefore, it is pivotal to analyze factors that may contribute to ED LOS.

Objective: This review aimed to identify and discuss factors that contribute to the Emergency Department length of stay (ED LOS) to improve the quality of care.

Methods: Relevant healthcare databases including PubMed and CINAHL were searched using the combinations of search terms: length of stay, length of visit, emergency department, emergency room, and patient flow. Inclusion criteria included publications between 2007-2017.

Results: A total of 24 relevant papers was selected. The literature indicates that three main factors are associated with ED LOS: input (older patients and acuity level), throughput (diagnostic tests and or radiology, specialist

consultation), and output (need for admission and boarding time).

Conclusion: Input, throughput, and output factors are contributed to ED LOS. Further review is necessary to determine organizational factors that may contribute ED LOS including the number of health staff, staff workload, flow studies, and health system. **(Author's abstract)**

Keywords: *Length of stay, Length of visit, Emergency department, Emergency room, Patient flow, Medicine*

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0307

Factors Predictive of Treatment Response and Survival in Filipino Patients with Autoimmune Hepatitis

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Background: There is a dearth of data on Filipino patients with autoimmune hepatitis (AIH). We aimed to describe the demographic and clinical profiles of patients with AIH and to characterize clinical outcomes and treatment responses.

Methods: A retrospective cohort study involving patients from two tertiary centers diagnosed with AIH from January 1, 2007, to December 31, 2019, was included. Disease remission was defined as the normalization of ALT levels, while failure was defined as an increase in ALT levels over baseline or clinical deterioration.

Results: A total of 48 patients were identified between 2007 to 2019. The median age at presentation was 51 (27-79 yrs.). Liver cirrhosis was already present in 37.5% (27.1% decompensated) on diagnosis. Aside from a higher histologic activity index in females (p=0.047), there were no gender-specific differences. Disease remission was achieved in 41.9% of patients at 6 months, while only 9.3% failed. At the final disposition, remission rates had slightly increased to 58%, but failure rates had risen to 12%. Treatment responses at both 6 and 12 months and MELD and Child-Pugh class influenced treatment responses at final disposition. Median overall survival was 102 weeks and was influenced by the presence of liver dysfunction and 12 months and final treatment responses.

Conclusion: Autoimmune hepatitis remains an important cause of morbidity and mortality. The results of the study highlight the need for immunosuppressive therapy to induce early remission for a higher likelihood of subsequent biochemical remission to reduce the risk of liver-related mortality. **(Author's abstract)**

Keywords: *Autoimmune Hepatitis, Treatment response, Liver Cirrhosis, Steroids, Azathioprine, Medicine*

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0308

Family caregiver: Caring on family carers

Javison, Sherwynn

This study was conducted to clarify the idea of caring for non-professional family caregivers and identify their vulnerabilities while caring for their patients. This concept was developed because of the non-availability of structured caregiving programs for non- professional family caregivers in the hospitals and community. This issue might lead to potential health and safety hazards for patients and caregivers. Nurses and non-professional family caregivers can co-create a safe and loving environment ideal for patient care. Nurses are essential to upholding the health and safety of non-professional family caregivers while developing their confidence and care performance. Moreover, training the non-professional family caregivers in the hospital and communities would promote safe and effective nursing practice in preparation for a smooth patient transition at home. **(Author's abstract)**

Keywords: *Family caregiver, Non-professional family caregivers, Nursing, Caring, Work-related hazards, Collaboration, Medicine*

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0309

Feasibility and Acceptability of an Electronic Mobile Device Application Among Physicians from the Private Sector for Reporting Cases to the National TB Program

Roman, Arthur Dessi E. , Garcia, Jemelyn U., De Los Reyes, Mari Ros

Introduction In the 2016 National TB Prevalence Survey, the prevalence-to-notification ratio for smear-positive pulmonary tuberculosis was 3.1. In the TB registry, 94% of cases were reported by public providers, suggesting insufficient reporting from private physicians. This study describes the feasibility and acceptability of an electronic mobile device application for possible use among private physicians for reporting their TB cases.

Methods This interventional, pre-, and post-test study uses an electronic mobile device application to report TB cases. Using the application, physicians collected and uploaded specific information for reporting cases. The participants were duly-licensed physicians and board certified in any of the following: Internal Medicine, Adult Infectious Diseases, Adult Pulmonology, Pediatrics, Pediatric Infectious Diseases, or Pediatric Pulmonology. The participants used an electronic mobile device application for reporting TB cases. Feasibility and acceptability were assessed using a questionnaire and through a focus group discussion. Data were summarized with mean and standard deviation for continuous variables and proportions for categorical variables.

Results The study was conducted at the Research Institute for Tropical Medicine, a government hospital with a Tuberculosis Directly Observed Treatment Short-Course (TB DOTS) facility. Of the 30 physicians invited to participate, 24 provided consent, but only 15 downloaded the application (age range 34-61, mean 39 years, 11 females). Eleven of 15 physicians (73%) assessed the mobile application as easy to navigate and felt that information encoded was relevant to patient care. However, the internet connection affected the speed of the application. The physicians said they had no time, were too busy, or simply forgot to encode patient data.

Conclusion The use of the application is acceptable but not feasible for use by private physicians. Modification to the application may be done to improve uptake by private physicians. **(Author's abstract)**

Keywords: *DOTS, Tuberculosis, Case reporting, Digital mobile device, Medicine*

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0310

Fertility Desire and Associated Factors Among HIV/AIDS Women with Antiretroviral Therapy in Yogyarta, Indonesia

Lutfiyati, Afi , Sari, Ike Wuri Winahyu , Rukmi, Dwi K

Women living with HIV/AIDS (WLHA) in Indonesia face a lot of stigma in their communities, even in healthcare settings. Because of this, their desire to have biological children is suppressed. However, some positive changes to the desire to have children may be apparent with the introduction of antiretroviral therapy (ART). Fertility desires may also have implications for unprotected sexual intercourse. To date, there is limited knowledge about the fertility desires of WLHA receiving HIV care in Yogyakarta, Indonesia. Hence, the present study explores the extent of this fertility desire and its associated factors among WLHA in Yogyakarta, Indonesia. Using a cross-sectional quantitative research design, 303 WLHA who are receiving ART, were obtained via convenience sampling in five districts in Yogyakarta between March and August 2019. WLHA with a hysterectomy and permanent contraception were excluded. Data were collected using a questionnaire and analyzed using descriptives, chi-square, and logistic regression. Just over half of the WLHA (50.8%) wanted to have at least one biological child without gender preferences. Bivariate correlations showed that younger age, formal employment, and not having a living biological child correlated with greater fertility desire ($p<.05$). Alogistic regression further indicated that age (35 years or younger)($p<.001$; AOR: 3.33; 95% CI: 2.00 to 5.53) and being childless ($p<.001$; AOR:.13; 95%CI:.52 to .33) were the most influential factors associated with the fertility desire among WLHAin Yogyakarta. We found that the WLHA, who were receiving ART in Yogyakarta, wanted to have their biological children. Since fertility concerns are an integral part of HIV patients' care, health workers can help the groups of WLHAwho desire to have biological children make the right reproductive decisions by letting them know the benefits and risks of childbirth and measures to prevent HIV from spreading. **(Author's abstract)**

Keywords: *HIV, Women, Art, Fertility desire, Medicine*

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0311

A Filipino Child with Schinzel-Giedion Syndrome

Salonga-Quimpo, Rhea Angela M. , Abacan, Mary

Schinzel-Giedion syndrome is a rare condition characterized by dysmorphic features, neurologic features, urogenital abnormalities, and radiographic changes. The etiology has been traced to mutations in the SETBP1 gene. We report a Filipino patient with features suggestive of Schinzel-Giedion Syndrome and the first to be confirmed through molecular testing. **(Author's abstract)**

Keywords: *Schinzel-Giedion, SETBP1, Coarse facies, Midface retraction, Medicine*

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0312

Filipino Health Care Professionals' Knowledge, Attitude and Perception regarding Drug-Susceptible and Drug-Resistant Tuberculosis in a High TB Burden City in Central Luzon: A Cross- Sectional Study

Tanwani, Albert , Nocum, Maria Lourdes , Redondo-Samin, Divina Cristy , Manzano,

Introduction: Tuberculosis (TB) is one of the major diseases responsible for the public health and economic crisis in low-income countries, with the Philippines as one of the eight countries in 2020 that accounted for two thirds of the new TB cases worldwide. Its three most populous regions which are the National Capital Region, Calabarzon and the Central Luzon Region reported the highest number of TB cases in 2015. One important consideration is that health care providers' knowledge, attitude and perception regarding TB largely affects the success of TB treatment.

General Objective: This study assessed the knowledge, attitude and perception among health care professionals who manage tuberculosis, using a validated questionnaire regarding drug-susceptible and drug-resistant tuberculosis in Cabanatuan City, Nueva Ecija.

Methodology: Cross-sectional study was used in this research. All health care professionals assigned in each identified health facility were asked to participate in the study. After obtaining informed consent, a self-administered questionnaire was given to all participants to answer. Descriptive statistics and Chi-square tests were used in data analysis.

Results and Discussion: A total of 113 participants were included in the study. Physicians, nurses and medical technologists were found to have good TB knowledge compared to pharmacists. Those who had training on TB DOTS were found to have good knowledge towards tuberculosis compared to those who had no training. Most participants, regardless of their profession, length of stay at TB DOTS Centers, and their training on TB DOTS, had a favorable attitude and perception towards patients infected with TB.

Conclusion: The lack of training may have largely contributed to the poor knowledge of HCPs which may possibly hinder the success of providing TB treatment. It is therefore of paramount consideration that prior to the HCPs' assignment in TB DOTS centers, all HCPs must first undergo training in order to manage TB treatment properly and successfully. **(Author's abstract)**

Keywords: *Health Care Professionals, Knowledge, Attitude, Perception, Drug-Resistant Tuberculosis, Medicine*

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0313

Filipino next generation nurses as frontliners amid COVID-19 pandemic: A Husserlian phenomenology study

Miranda, Melvin D. , Valencia-Raymundo,

Purpose: Since the outbreak of the unprecedented COVID-19 health crisis, Filipino nurses are one of the vital health workers in fighting its devastation in the Philippines. The study aimed to describe the lived-experiences of Filipino next generation nurses as frontliners in the midst of COVID-19 pandemic.

Design: The paper espoused the qualitative research design of inquiry exclusively Husserlian descriptive phenomenology. Study participants were selected using non-probability, purposive sampling design. The sample (N=19) was consisted of Filipino nurses with less than 10 years of practice experience, referred to as next-generation nurses, who function as frontline healthcare workers in healthcare settings, both male and female. The study was conducted in the national capital region (NCR), which has the most COVID-19 cases in the country. Due to the community quarantine imposed by the national government, the corpus of data was collected through virtual semi-structured interviews and from the participants' testimonies posted in social-media.

Method: An adaptation of Colaizzi's empirical phenomenological research approach was utilized to obtain an in-depth understanding and analysis of study participants' experiences.

Findings: The profound, life-changing experiences of a select group of Filipino next- generation nurses were unified in three interesting themes, namely,: acclimatization to the challenges of the novel clinical situation, affirmation of the spirit of resiliency, and actualization of the valued calling.

Conclusion: The contagion has demanded a new way of working, and these nurses have risen to the challenge, and demonstrated how capable they are at responding to new situations and uncertainty. Despite facing dire challenges, they demonstrate the spirit of resiliency. This health crisis enables them to impart the value of the nursing vocation. As they navigate this unprecedented contagion, their experiences and status could likely alter at different phases of the pandemic. Hence, the provision of long-term and holistic support for them is necessary to preserve their welfare. **(Author's abstract)**

Keywords: *COVID-19 pandemic, Frontliners, Husserlian phenomenology study, Next generation nurses, Medicine*

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NP

0314

Fitness Nursing: A Concept Analysis

Almazan, Anthony

The concept of fitness nursing has not been fully defined in the nursing profession but has slowly emerged due to the increasing interest of people in physical fitness and a healthy lifestyle. Hence, this analysis aims to add Fitness Nursing to the body of nursing knowledge that is currently undefined. Walker and Avant's framework for concept analysis will be used to discover the concept. Definitions of the concept are presented along with related terms. Antecedents, attributes, and consequences of the concept are presented in detail. Model, borderline, related, contrary and invented cases are presented to provide a rich representation of the concept. Empirical referents and nursing implications are presented. The concept of Fitness Nursing can be defined as the combined science of nursing with the art of personal training that focuses on health promotional activities and disease preventive measures through physical fitness. The defining attributes are physical training and health coaching. The consequence of Fitness Nursing may be presented in two aspects, Individual aspect includes increased vitality, a better body shape, higher self-esteem, better fitness overall, and most importantly, avoidance of chronic illnesses. As for the community, the outcome would be a healthier community with increased productivity and increased lifespan. **(Author's abstract)**

Keywords: *Fitness Nursing, Physical Fitness, Medicine*

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0315

A Five-Year Trend Analysis of the Philippine Nurse Licensure Examination (2014-2018)

Montegrico,

Purpose: This study analyzed the trend of the Philippine Nurse Licensure Examination (NLE) results from 2014 to 2018.

Design: A retrospective research design was used to describe the five-year trend in the NLE. It determined the association between NLE outcome (pass/fail) and the type of examinee (first time vs. repeat examinees) and timing (month) of taking the exam (May/June vs. November).

Methods: Trends in NLE results were examined to determine the pass and fail rates over five years as an indication of the quality of nursing education. Secondary data analysis was conducted after collecting publicly available NLE data. Odds ratios were estimated to express whether the odds of passing differ for the type of examinee and month of taking the NLE.

Findings: The overall pass rates indicated a decreasing trend over the past five years (47.5% to 41.3%). The first-time pass rates showed an increasing trend (70.6% to 77.3%) while the repeat pass rates revealed a decreasing trend (31.6% to 28.2%). The odds of passing the NLE among first-time examinees is 7.01 times the odds of passing the NLE compared to repeat examinees [OR = 7.01 (95% CI = 6.86, 7.12)]. The odds of passing the NLE in November is 1.32 times the odds of passing in May/June [OR = 1.32 (95% CI = 1.29, 1.34)].

Conclusions: Despite the increasing first-time pass rates, a large number of nursing graduates still fail the NLE, especially among the repeat-takers. The results of this study can be used to improve nursing programs by developing measures to increase the NLE passing performance through assisting at-risk first-time examinees prior to taking the NLE and developing programs to assist graduates who will retake the NLE. **(Author's abstract)**

Keywords: *Nurse licensure examination, First-time pass rates, Nursing education, Philippines, Medicine*

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NP

0316

FOSTERING PARTNERSHIPS BETWEEN THE ACADEME-GOVERNMENT AND COMMUNITY IN THE COVID-19 PANDEMIC RESPONSE IN THE PHILIPPINES

Bonito, Sheila R. , Abad, Peter James B. , Mabale, Maria Angela A. , Tomanan, Kristine

This paper describes the COVID-19 response efforts through strategic partnerships of a nursing school in the Philippines. The roles of the academe through teaching as well as continuing education and community extension services programs were particularly harnessed. Existing academe-government-community partnerships were leveraged, and personal networks mobilized to provide support on risk communication, community engagement, and capacity building. Challenges and limitations encountered serve as points for improving the academe's strategies and activities. The lessons from this undertaking highlight the crucial role of nursing schools as relevant resources in COVID-19 pandemic response initiatives. Partnerships and networks built prior to the pandemic are instrumental in providing the space and opportunities for faculty and student nurses to aid in strengthening the local response. Recommendations are outlined to enhance current roles, strategies, and activities of the academe in the COVID-19 pandemic and lay future directions for Philippine nursing schools given the increasing incidence and severity of disasters in the country. **(Author's abstract)**

Keywords: *Academe-government-community partnership, Public health nursing, Disaster response, Disaster nursing, COVID-19, Public health emergency, Medicine*

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NP

0317

Glycemic Gap as a Predictor of Adverse Outcomes in Patients with Type 2 Diabetes Diagnosed with COVID-19 in a Tertiary Hospital in Metro Manila: A Retrospective Cohort Study

Montano, Carolyn N. , Isidro, Maria Jocelyn C. , Enverga, Mar

Background: Although elevated glucose levels are associated with adverse outcomes in the critically ill, HbA1c-based adjusted glycemic variables have not been extensively utilized as a tool to evaluate patients in the acute critical condition.
Objective: This study aims to determine whether glycemic gap can predict adverse outcomes in patients with type 2 diabetes diagnosed with COVID-19.

Methodology: A single center and retrospective study of adult patients with type 2 diabetes diagnosed with COVID-19. Glycemic gap was calculated as the difference between the admission blood glucose and A1câ€• derived average glucose. Logistic regression was used to determine association of glycemic gap and several adverse clinical outcomes. A decision curve analysis was used to determine the clinical utility of a clinical decision model based on this cut-off.

Results: A total of 150 diabetic patients with COVID-19 were analyzed. Median baseline HbA1c was 7.5% (range 4.79–18.42), while median admitting blood glucose was 196 (range 71–506) mg/dL. From these, computed glycemic gaps ranged from -180.5 to 312.8 mg/dL, with a median of 13.75 mg/dL. On univariate analysis, for every unit increase in glycemic gap, odds of developing ARDS increased five times (cOR 4.798, 95% CI 2.08 to 11.09); odds of developing shock increased four times (cOR 4.48, 95% CI 1.48 to 13.44). No single cut-off value for glycemic gap was able to discriminate patients with favorable outcome from those with adverse outcome. The decision curve analysis graphically shows that glycemic gap has a positive net benefit for threshold risk of 50% or higher.

Conclusion: Higher glycemic gaps were significantly associated with increased risk for poor outcomes in diabetic patients with COVID-19. Glycemic gap should be correlated with clinical status and other laboratory parameters to make it a more powerful discriminant among COVID-19 infected patients. **(Author's abstract)**

Keywords: *Glycemic gap, Type 2 diabetes, Adverse outcome, COVID-19, Medicine*

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NP

0318

Guillain-Barre Syndrome after Appendectomy: A Case Report

Ong, Marissa , Salcedo, Von Edw

Background: Guillain-Barre syndrome (GBS) is an acute monophasic paralyzing illness that typically occurs after gastroenteritis and respiratory tract infection. Antecedent surgical procedures are less recognized trigger of GBS.

Objectives: This paper aims to report a case of demyelinating variety of GBS that developed after appendectomy.

Methods: This is a case of a 39-year-old Filipino male who was admitted due to acute appendicitis. He developed lower extremity weakness 4 days after appendectomy. His motor deficit initially presented distally from lower extremities, which advanced to the trunk, upper extremities, and muscles of speech and deglutition. Paresthesia of the fingers and toes and distal areflexia on both lower extremities were also elicited.

Results: Diagnosis was done clinically. Nerve conduction study showed demyelinating variant, uncommon for a post traumatic GBS. Supportive care was rendered which resulted in complete recovery.

Conclusion: Surgery is a known but less identified cause of GBS. Although rare, we should consider GBS in patients presenting with ascending or progressive weakness after recent surgery because its early identification renders immediate and appropriate treatment. **(Author's abstract)**

Keywords: *Guillain-Barre Syndrome, Acute Inflammatory Demyelinating Polyneuropathy, AIDP, Appendectomy, Medicine*

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NP

0319

Hairy Cell Leukemia in a Filipino Male during the COVID-19 Pandemic – Report of a Rare Case

Mayo, Maribeth Buan , Viray, Karmina Via

Hairy cell leukemia (HCL) is a rare, chronic, mature B-cell lymphoproliferative disorder accounting for 2% of all leukemias. In this paper, we would like to present our experience in the management of HCL in a financially limited setting where other diagnostic tests and chemotherapy are unavailable. The case report aims to emphasize the recognition of the distinctive morphology of hairy cells in the peripheral blood in the consideration of the initial diagnosis.

A 60-year-old Filipino male was incidentally found to have anemia, thrombocytopenia and an absolute neutrophilic count below 1,000 in a pre-operative clearance for elective herniorrhaphy. Blood smear revealed atypical lymphocytes with hair like cytoplasmic projections. CT-scan of the abdomen showed splenomegaly and prominent paraaortic nodes. Flow cytometry of the bone marrow aspirate was consistent with an involvement of a Mature B cell neoplasm markers CD19, CD20, CD22 and surface immunoglobulin lambda and hairy cell leukemia markers CD11c, CD103 and CD25. He responded to six-weekly sessions of Cladribine with remission of the bone marrow and hematologic parameters.

HCL is a rare type of a mature B cell neoplasm characterized by pancytopenia, splenomegaly, bone marrow fibrosis and the presence of atypical lymphoid cells with hairy projections in blood, bone marrow and spleen. Immunophenotyping express CD11c, CD103, CD123, and CD25. BRAF V600E mutation is the disease defining genetic event. Cladribine and Pentostatin are the first line of treatment.

Cases of leukemia can be easily overlooked because of the mild derangement in the complete blood count. A meticulous differential review of the atypical lymphocyte, is the first step in the diagnosis of this rare disease. **(Author's abstract)**

Keywords: *Hairy cell leukemia, Cladribine, Immunophenotyping, Medicine*

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0320

Health Promoting Lifestyle Behaviors of University Employees in Work-From-Home Arrangement during the COVID-19 Pandemic

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Since the COVID-19 emerged, a work-from-home (WFH) arrangement was implemented as an infection containment measure among employees. This lifestyle change is bound to affect health-promoting behaviors. The study aims to determine the health-promoting lifestyle behaviors of university employees in a WFH arrangement during the COVID-19 pandemic. This study utilized a quantitative descriptive research design. After consecutive sampling of employees of a state university in Manila, the response rate was 33.1% (395 out of 1, 195 eligible respondents), but only 31.8% or 380 respondents completed the validated online questionnaire through Google FormsTM from August to October 2021. The instrument was based on the Health Promoting Lifestyle Profile (HPLP) survey by Walker and Hill-Polerecky (1996). Descriptive data analysis was done via IBM® SPSS® Statistics v22. Majority were females (70.3%) and single (51.8%). Approximately 70% were staying at home with their family. The mean scores for the subscales of inner development, interpersonal relations, and stress management were 3.08 (SD±.24), 3.00 (SD±.30), and 2.70 (SD±.30), respectively. These were observed to be higher than other HPLP subsets. Subscales garnering the lowest mean scores were physical activity at 2.32 (SD±.21), nutrition at 2.68 (SD±.31), and health responsibility at 2.56 (SD±.12). The mean HPLP score of faculty members was the highest at 2.74 (SD±.36) as compared to administrative staff and research extension and professional staff (REPS) with mean scores of 2.73 (SD±.36) and 2.71 (SD±.39), respectively. Overall HPLPscores suggested that the majority (60.8%) practice “good” health-promoting lifestyle behaviors. These findings indicate that the WFH arrangement allows employees to develop social and coping skills while staying in their residences. Whereas limitations to opportunities for a more active lifestyle, availability of nutritious food, and access to health care also contribute to the low HPLP scores. Health promotion and protection strategies such as nurse-led health programs must be instituted to improve and develop the knowledge, skills, and attitude among employees working from home in the aspects of nutrition, physical activity, and health responsibility. Nurses must also use this opportunity to promote occupational health among employees through lifestyle programs in coordination with universities and colleges or other workplaces of similar nature. Health programs must capitalize on the increase in the utilization of social media and the Internet during the pandemic. There is a need for further research to examine associations between the variables in various institutions and settings. **(Author's abstract)**

Keywords: *Health promotion, Lifestyle behaviors, Work-from-home, COVID-19 pandemic, Medicine*

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0321

The Health-Seeking Behaviors Among the Older Adults of Central Aurora

Magadan, Pe

This descriptive cross-sectional study presents the health-seeking behaviors among older adults in Central Aurora, Philippines. Using a survey questionnaire, 179 older adults from 4 municipalities were interviewed. Participants were mostly 60-64-year-old married females, living with spouse, children, and grandchildren, with an average monthly income of 1001-5000 pesos, working as farmers, were self-employed, were Roman Catholics, and with an elementary level of education. The health-seeking behaviors were described in terms of physical, emotional,

mental, social, and spiritual dimensions, with the spiritual dimension garnering the highest average mean of 4.01 (scale of 1 or never to 5 or always), and physical and mental dimensions the lowest average means of 3.58 and 3.31, respectively. These results attest to the Filipino value for the spiritual realm as an important dimension of health- seeking behaviors and the physical and the mental dimensions of lesser concern. Recommendations include creating a wellness program to enhance health-seeking behaviors in all dimensions. **(Author's abstract)**

Keywords: *Health-Seeking Behaviors, Older Adults, Central Aurora, Medicine*

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0322

HUMANistic Caring: An approach for meeting the care needs of Filipino gay and lesbian older persons

Luna, Evelyn Acas , Catalan, Jed Patrick M

Quality care is a basic human right and a core foundation for a patient's health, recovery, and well-being. In the current Philippine context, gay and lesbian older persons face gender-care disparities in the caring dynamism. Until now, their care needs are not articulated in the country's basic nursing curriculum. Consequently, the care approach is incongruent, biased, and risky. In response to this gender-care disparity, participatory action research (PAR) was used to identify this cohort's care needs and their meaning by developing a nursing care hub called the 'Gay Care Center' for older gays and lesbians. This paper focuses on describing: (a) the current situation of nursing care among the gay and lesbian older persons; (b) the meaning of care needs from their perspective; and (c) the Gay Care Center's tailored approach and services to meet their care needs. Multiple sources were utilized to collect data: focus group discussions, in-depth interviews, and observations. Data were then analyzed using Mayring's qualitative content analysis. Findings revealed that caring practices for older gays and lesbians could only be effective, satisfying, and holistic when the meaning of their individual needs are sensitively listened to, understood, and met. This led to the coined term HUMANistic caring, a new approach that emerged as their preferred mode of care. It is recommended that extensive gender-care training be conducted among gerontological nurses, and this be incorporated in the nursing curriculum to ensure that the provision of care is safe, respectful, humane, and just. **(Author's abstract)**

Keywords: *Humanistic caring, Gay-friendly care hub, Gerontology nursing, Gender-care disparity, Care approach, PAR, Medicine*

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0323

Ibaloy Traditional Pregnancy and Child Care Practices in Bokod, Benguet

Basatan, Christ

The Cordillera is home to indigenous pregnancy and childcare practices. This study describes the Ibaloy traditional health practices of which little are known. It seeks to contribute to the literature about indigenous pregnancy and childcare practices. This two-year ethnographic study was conducted in Mangagew, Poblacion, Bokod, Benguet. Data was gathered through field observations and interviews with mothers, elders, and traditional birth attendants. The findings showed that Ibaloys are strongly connected to their traditional beliefs and possess strong family and

community support for pregnant women and their children. Most of the traditional beliefs and practices of caring are still observed, alongside modern healthcare principles and practices. There are myriad of factors that influence Ibaloy health care decisions apart from their traditional beliefs and practices. Achieving health for these vulnerable groups requires multi-sectoral linkages and active community participation. The result of this research serves as a basis for culturally appropriate evidence-based care for both the Ibaloys and similar groups, and as reference for the Ibaloys' slowly fading traditional beliefs and practices. **(Author's abstract)**

Keywords: *Ibaloy, Childcare, Healthcare, Indigenous health practices, Pregnancy, Traditional practices, Medicine*

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0324

Idiopathic Pyoderma Gangrenosum a Rare Cause of Ulcerative Lesion in the Leg: A Case Report

Robles, Jeremyjones F. , Vergara, Jovy Louie Anth

Background: Pyoderma gangrenosum is a rare ulcerative skin disease that can present as an ulcerative skin disease with the prominence of pain. The pathogenesis may be related to disruptions in the immune pathways. Targeted therapy is lacking and current treatment is largely empirical and consists of corticosteroids and cyclosporine first line. Early recognition can improve clinical outcomes.

Case: This case is a 67-year-old male diabetic who was admitted for a progressive ulcerative lesion on the right leg. Arterial Doppler studies and CT angiogram of the right lower extremity were normal. Blood and deep wound cultures of the lesion showed Klebsiella pneumoniae and Pseudomonas aeruginosa. Multiple antibiotic regimens were given with no improvement of the ulcerating lesions of the leg. Pain on the lesion remained persistent. The tissue biopsy of the lesion taken during debridement revealed that it was a pyoderma gangrenosum with dystrophic sclerosis. Oral prednisone at 1 mg/kg was added to the regimen which improved pain but the lesion did not improve. The persistence of the pain and progression to sepsis during the hospital course prompted the decision to do an above-knee amputation of the right leg. He was discharged improved.

Conclusion: Pyoderma gangrenosum is a rare non-infectious cause of an ulcerative lesion in the lower extremity. Diabetes is a strong risk factor for this disease. The course is prolonged with the possibility of secondary infections. Upon histopathologic confirmation, an anti-inflammatory regimen could help improve outcomes. **(Author's abstract)**

Keywords: *Pyoderma gangrenosum, Diabetic foot, Leg ulcer, Inflammation, Anti-bacterial agents, Amputation, Medicine*

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0325

The Importance of Encouraging Child Development

Trakooltorwong, Pimka

Quality child growth and development are important tools in assisting today's children to become the adults of the future. Hence, developmental delays in young children have an impact not only on a child's abilities to learn new skills, but also in the opportunities of the greater community or society. In this regard, parents and caregivers are the most well-equipped to prevent the child from experiencing developmental delays. Children will learn to trust the person who sensitively interacts with them and this trust provides a foundation for future learning, growth, and development. This paper looks at the importance of encouraging child development through the parents or guardians of children, since they are inevitably linked to a child's learning, and they know their own children better than anyone else. Parents and guardians who do not have the skills required to monitor and encourage the development of young children can and should be trained by professionals. This research reveals that training parents and guardians to use the Developmental Surveillance and Promotion Manual in monitoring and encouraging development of young children is a very important way to prevent future developmental delays. **(Author's abstract)**

Keywords: *Child development, Developmental delays, Quality child growth, Medicine*

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0326

Improvement in Specimen Adequacy with Ultrasound-guided Fine-Needle Aspiration Biopsy (FNAB) of Thyroid Nodules Using Rapid On-site Evaluation (ROSE): A Cross-sectional Study

Alcazaren, Elizabeth Ann S. , Chua, Francis Bryant G. , Dungca, Pia Pam

Background. Fine-needle aspiration biopsy (FNAB) is the most accurate and cost-effective method to evaluate thyroid nodule for possible malignancy. However, an adequate specimen is required for proper examination by a pathologist. Rapid on-site evaluation (ROSE), a service typically provided by pathologists, is the real-time evaluation for adequacy of FNAB smears which can help improve adequacy rates by allowing the submission of additional thyroid samples when the submitted samples are inadequate. This study aims to investigate if ROSE done by trained Endocrinologists can improve specimen adequacy in our patients.

Methods A total of 192 patients were included in this study and were divided in two groups: a ROSE group (n=96) and a non-ROSE group (n=96). In the ROSE group, the smear of thyroid aspirate was evaluated for adequacy by a trained Endocrinologist in real time. In the non-ROSE group, specimens are directly sent to the Pathologist.

Results ROSE done by Endocrinologists had 94% sensitivity, 46% specificity and 82% accuracy compared to a Pathologist. The adequacy rate under the ROSE group was 84.38% and 81.25% in non-ROSE group.

Conclusion Our study showed that ROSE can improve adequacy rate in our center. ROSE can also be used by physicians in the provinces who are performing FNAB of the thyroid without ultrasound guidance to improve specimen adequacy and lessen repeat biopsy. **(Author's abstract)**

Keywords: *Rapid on-site evaluation (ROSE), Thyroid fine-needle aspiration biopsy, FNAB, Specimen adequacy rate, Medicine*

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0327

Incentivizing (and Disincentivizing) Mothers to Utilize Maternal Health Services: A Focus Group Study

Pagatpatan, Jr., Celso , Perez, Amihan, Ramirez, Caroline

Background. In ensuring access to maternal health services, various strategies toward safer health practices and improved health service delivery are important ingredients to eliminate avoidable maternal deaths. A recent household survey showed that access to antenatal care (ANC) (89%) and facility-based delivery (FBD) (82.4%) in the Eastern Visayas region is significantly high, despite the extensive damage to over 500 health facilities caused by Typhoon Haiyan in November 2013. Postpartum care (PPC), however, was relatively low (37.4%). As these findings needed further elaboration, a qualitative study using focus groups was conducted.

Method. The focus groups method was utilized to elicit responses from the mothers, BHWs, and midwives to explain what contributed to the high ANC visits, high FBD, and low PPC. Sixteen focus groups were conducted in the local dialect (Waray and Cebuano), and all discussions were audio recorded. Focus groups data were transcribed and subsequently translated to English text, then reviewed and validated by socio-linguistic academics from the region. Other data sources included debriefing session reports and expanded field notes. Nvivo 10 software was used in the coding process and data management. The data analysis referred to the principles of thematic analysis.

Results. The findings showed that incentives in the form of free maternal services and cash grants drive mothers to go to the health facility for antenatal care and facility-based deliveries. The free services were provided by PhilHealth (the country's social health insurance), while cash grants were awarded through the government's conditional cash transfer program and other community partners. Mothers were provided with some financial risk protection through these financial incentives. The disincentives came in the form of local ordinances, which prohibited home births. Penalties included fines for both mother and birth attendant when the mother was found to deliver outside the health facility. The unintended stigma, shame, and fear that developed in response to these ordinances also deterred home births. The significantly low use of PPC services in the health facility was attributed to the lack of advices given to mothers regarding the need for follow- up care after delivery. It is also noted that there are no incentives for PPC, which may contribute to its low rates. The role of the community health workers and midwives were to inform and educate the mothers on these incentives and disincentives. However, these incentives and disincentives are extrinsic motivators and are deemed insufficient to provide long-term impact.

Conclusion and Recommendations. The implementation of the incentives and disincentives in Eastern Visayas has increased rates of ANC and FBD. The presence of these in the current environment has initially facilitated behavior change, shifting home births to facility births. However, we argue that financial incentives, with a lack of intrinsic motivation, may be insufficient to sustain long-term impact. Disincentives, in the form of local ordinances, forced mothers instead to seek care in facilities. Such an approach may eventually become less effective over time. Incentives and disincentives are both demand-side factors, and to sustain change, concurrent improvements in the supply end need to be implemented. The capacity of facilities to absorb the increased demand should be in place to provide positive experiences for mothers in the health facilities. **(Author's abstract)**

Keywords: *Antenatal care, Facility-based delivery, Postpartum care, Home-based delivery, Access, Medicine*

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0328

The Interplay of C.P.A. in Elderly Care Towards Client Care Satisfaction

Nemenzo, Endrex P. , Palompon, Da

This study explored the interplay of the care culture (C), caring process (P) and care agent (A) in the care of older adults towards care satisfaction and quality of life. Two elderly care facilities (public and private) were considered as cases of this study. Using case study design, four elderly clients were asked to answer the Modified Patient Satisfaction Questionnaire, and five care facility personnel were interviewed and observed. The cross-case analysis derived the themes: a) a caring governance is a felt privilege for the elderly; b) housing arrangement: security or vulnerability?;c) How did you take care of me?: Its influence on patient care outcomes; and d) Elderly care provider: What am I?. The landscape of elderly care is a combination of the environment, culture, process and the agent who made the care more effective through patient outcomes and satisfaction. These factors have interacting relationship which one to the other but ultimately leads to a question of the elderly clients' present disposition and conditions. **(Author's abstract)**

Keywords: *Elderly care, Care culture, Care process, Care agent client care satisfaction, Medicine*

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0329

Knowledge and Attitude on the Nurse Practitioner Role of Nurses and Physicians in Two Tertiary Hospitals in Metro Manila

Duller, Sa

The role of the nurse practitioner (NP) has been successfully implemented globally including in some Southeast Asian countries. However, the Philippines has yet to enact this expanded role, notwithstanding being faced with the common factors influencing the evolution of the NP role indicated in the literature. With the proposed repeal of the current Philippine Nursing Law to include Advanced Practice Nursing, this study aimed to determine the knowledge and attitudes of nurses and physicians in the Philippines on the NProle. Sixty-six participants (41 nurses and 25 physicians) completed the survey on the knowledge and attitude on the NP role, conducted in two tertiary-level hospitals in Manila. Nurses have statistically higher scores on items regarding general understanding of the NP role, and on the difference of the NP from senior nurses. However, the difference of overall survey scores on the knowledge and attitude on the NP role between nurses and physicians was statistically non-significant. These results support the need to raise awareness on the role of the NPs by educating nurses, physicians, and other healthcare professionals in the Philippine setting. **(Author's abstract)**

Keywords: *Advanced practice nursing, Nurse practitioner, Knowledge, Attitudes, Medicine*

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0330

Knowledge and Attitudes towards COVID-19 Infection and Anxiety Levels of Nigerian Youths Regarding the COVID-19 Pandemic

Chidimma, Nwankwo , Chullapant, Kanokwan , Ede, Sunday Stephen , Emeka, Anyiam Felix , Mary, Aroh Chinazaekpere , James, Batholomew Chibuike, Michael, Uhuo Ikec

Objectives. Youths can function as agents of change by disseminating essential information, but they a re also considered a vulnerable group in the COVID-19 pandemic. Literature on COVID-related knowledge, attitude, and anxiety has not focused comprehensively on youths. This study assesses the knowledge, attitudes,

and anxiety level of youths in eastern Nigeria during the COVID-19 pandemic.

Methods. We conducted a descriptive cross-sectional study using an online survey among young people between the ages of 18 and 35 years in southeastern Nigeria during the COVID-19 pandemic. We analyzed data using the Statistical Package for Social Science (SPSS) version 25 software. We used descriptive statistics, the Chi-square test, and bivariate and multivariate logistic regression analyses to measure the associations. A p-value of < 0.05 was considered statistically significant at a 95 percent confidence level.

Results. We included 397 participants. Majority of the study participants (88%) had a high level of knowledge about COVID-19. Around 68% showed a good attitude toward COVID-19 prevention, overall low anxiety related to the COVID-19 pandemic was proportionally higher at 57.43%. Knowledge and educational level were statistically significantly associated with anxiety levels related to the COVID-19 pandemic.

Conclusion. The young adults had a good knowledge of the COVID-19 transmission and symptoms, positive attitude, and low anxiety levels. Those with higher educational levels had good knowledge and lower anxiety level. Public health and mental health experts can use this material to help reduce high levels of anxiety among the vulnerable population affected by the pandemic. **(Author's abstract)**

Keywords: *COVID-19, Knowledge level, Attitudes, Anxiety level, Nigerian youths, Medicine*

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0331

Knowledge and Compliance to Standard Precautions and General Self Efficacy among Nurses in a Tertiary Hospital

Gatbunton, Crisa

Purpose: This study aimed to evaluate the level of knowledge on Standard Precautions, level of compliance to Standard Precautions, and General self-efficacy of nurses in a tertiary hospital. Also, this study aimed to identify the relationship between those variables.

Design and Methods: A descriptive correlational research design was utilized in the study. 168 nurses from the tertiary hospital from Nueva Ecija, Philippines were recruited to complete a questionnaire about their knowledge and compliance to Standard Precautions and their General self-efficacy. The data was coded, encoded, and statistically analyzed using PSPP 1.2.0 (GNU Project. New York City, New York, USA).

Results: Findings indicated that nurses have good knowledge and high compliance concerning standard precautions; also, findings showed that nurses have a moderate level of general self-efficacy. However, there was no remarkable relationship between the level of knowledge, level of compliance in Standard Precautions, and general self-efficacy.

Conclusions: Although the researcher concluded a high level of knowledge among nurses, statistical analysis showed no relationship when correlated with compliance. This concluded that knowledge of Standard Precautions does not necessarily influence compliance and its application. Also, findings inferred that a moderate level of general self-efficacy did not act upon the level of compliance of nurses to Standard Precautions. **(Author's abstract)**

Keywords: *Standard Precaution, Compliance, Knowledge, General Self-efficacy, Medicine*

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0332

Knowledge and Preference of Filipino COPD Patients on Advance Care Planning: A Cross-sectional Survey

Jorge, Manuel C. , Angeles, Roland Reuben B. , Abat, Marc Eva

Objectives. To explore the current experiences and perspectives of patients with chronic obstructive pulmonary disease (COPD) with advance care planning (ACP).

Methods. A cross-sectional survey was conducted among patients diagnosed with COPD in the Philippine General Hospital. Results were illustrated using descriptive statistics.

Results. A total of 90 patients were interviewed and included in the analysis. Nearly all patients were unfamiliar with the terms ACP (95.55%), end-of-life care (99.89%), and do-not-resuscitate order (100%). The majority expressed
a desire to have ACP discussions (94.44%) which were not viewed as distressing and were deemed be neficial (96.67%). Patients who were employed were more likely to express readiness to sign legal papers. Patients living with their nuclear family or living alone, and those with higher COPD assessment test (CAT) scores were more likely to relegate health care decisions to their doctors.

Conclusion. Most patients with COPD in our cohort are unfamiliar with ACP and have not received ACP discussions. Most think that it
will improve healthcare and quality of life. Some demographic and clinical factors may make patients more likely to engage in ACP-related activities. **(Author's abstract)**

Keywords: *Medicine, Advance care planning, Chronic obstructive pulmonary disease, Palliative medicine*

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0333

Knowledge, Attitude, and Intention to Practice Pre-Marital Testing Among Midwifery Students in Vietnam

Nguyen, Tram Thi My , Nguyen, Nhan Thi , Nguyen, Chi

Background: Hereditary diseases are considered one of the most common causes of death and morbidity in infants and children. It significantly burdens the health system, family, and society. Pre-marital testing is one of the most proactive and effective ways to prevent hereditary diseases, infectious diseases, and congenital abnormalities.

Purpose: To examine the level of knowledge and attitudes regarding pre-marital testing and the intention to practice pre-marital testing; and, To identify the correlation between knowledge, attitudes, and intention to practice pre-marital testing among midwifery students.

Methods: Adescriptive correlational study was conducted from May to July 2020 among 150 midwifery students at the University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam. The research consists of a questionnaire with four main parts: demographic characteristics, knowledge about pre-marital testing, attitudes toward pre-marital testing, and intention to practice pre-marital testing. Descriptive statistics and univariate

analysis were used for data analysis. The significance level of the statistical test was set up at $\alpha = .05$.

Results: The average age of students was 21.73 years old, most of them were unmarried (98%). More than three-quarters (80.7%) of them had good knowledge about pre-marital testing and (88.7%) of them had a positive attitude towards pre-marital testing. Most students (94.7%) have an intention to use a pre-marital test and believe in its benefits. Knowledge was positively correlated with intention to practice pre-marital testing ($X2 = 5.10$, $p = 0.02$). Likewise, attitude toward pre-marital testing was positively correlated with the intention to practice pre-marital testing ($X2 = 12.57$, $p < 0.001$).

Conclusions: The findings emphasized the important role of health education which is a keystone in improving pre-marital knowledge, attitudes, and the practice of pre-marital testing to prevent hereditary diseases and improve people's health. **(Author's abstract)**

Keywords: *Knowledge, Attitudes, Practices, Pre-marital testing, Midwifery students, Medicine*

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0334

Lessons from Asia: A Review of Five National Responses to the COVID-19 Pandemic

Palaganas, Erli

The outbreak of COVID-19 triggered various responses from nations in an effort to control its spread. This review aimed to assess the responses of China, South Korea, Japan, Singapore, and the Philippines, and identify effective strategies to address the pandemic's incidence and mortality rate. Using a descriptive review of existing literature, their responses were evaluated using the World Health Organization (WHO) Strategic Preparedness and Response Plan (SPRP) and the Sendai Framework for Disaster Risk Reduction (SFDRR), which outline long-term objectives of reducing viral transmission, and reducing disaster risks and losses respectively. The countries studied were able to engage and mobilize communities; find, test, and isolate cases; provide clinical care, and maintain essential health services. However, countries differ in implementation, mainly due to their varying Social Determinants of Health (SDH) and disparities in resources. The countries' common goal was to control COVID-19 and return to economic normalcy. This study showed that effective strategies in handling the pandemic contain the following aspects: 1) strategic preparedness by drawing from past experiences, 2) tactical restructuring of the healthcare system, 3) effective resource mobilization and management, and 4) effective use of communication and technology to engage with the public. The SFDRR global targets were clear long-term goals for countries to base their pandemic responses on. This could equip the countries with the right tools and policies for future disasters, including a pandemic. Glaring issues on countries' SDH should also be foremostly addressed. Economic inequality, communication gaps, and issues on governance are primary factors that hinder the effective management of the pandemic for countries. Policy makers and social development workers, including nurses, need to adopt a holistic framework in analyzing situations confronting their work such as disasters. **(Author's abstract)**

Keywords: *COVID-19, World Health Organization (WHO), Strategic Preparedness and Response Plan (SPRP), Sendai Framework for Disaster Risk Reduction (SFDRR), Medicine*

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0335

Level of Depression, Anxiety, Stress, and Coping Strategies among Filipino Healthcare Workers (HCW) with Confirmed Covid-19 Infection using the Filipino-translated Depression Anxiety Stress Scale (DASS) 21 and Filipino Coping Strategies Scale in Perpetual

Mangubat, Jill Henriett T. , Vista, Giovanni A. , Conopio, Arnel Y. , Banquirigo, Raym

Introduction: COVID 19 has become the most important public health issue today. It has the potential to significantly affect the mental health of frontline healthcare workers (HCW) putting them at a higher risk of developing psychological problems especially to those who acquired COVID19 infection.

Objectives: To determine the level of depression, stress, anxiety and coping strategies among Filipino HCWs with confirmed COVID-19 infection and its association with demographic and clinical profiles.

Study Design: Single center Descriptive study

Materials and Methods Consisted of 114 Filipino HCW with COVID 19 infection. Data were collected utilizing the Filipino translation of DASS 21 and Filipino Coping Strategy scale.

Results: There was a significant increase of HCWs with moderate depression, anxiety, and stress. A large proportion of the HCWs were also severely depressed, severely anxious and severely stress. Majority of the COVID19 positive HCWs were nurses accounting to 35%. More likely, the occupation was significantly associated with their degree of depression and stress. Hypertension associated significantly with elevated stress while having diabetes was instrumental for the depression, anxiety and stress. Moreover, appreciation was more felt at the workplace, then at home. While discrimination was prevalent in the community, workplace and social media. Religiosity ranked the most sought coping strategy.

Conclusion: The study has found that a large percentage of HCWs had moderate level and a notable portion of respondents had severe to extremely severe level in each of the psychological domains in which factors such as gender, occupation, comorbidities, area of assignment and disease severity have brought significant impact. Discrimination is prevalent in the community and surprisingly in the workplace. In contrast, appreciation was felt more at home and in the workplace. Religiosity was shown to be the top coping strategy among HCWs who tested positive. **(Author's abstract)**

Keywords: *HCWs, COVID-19, DASS21, Medicine*

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0336

Lip Trill Effects on Vocal Function, Vocal Pitch, and Harmonics-to-Noise Ratio: A Multiple Baseline Study of Three Vocally Healthy Females

Rotor, Esmerita R. , Chua-Lawas, Ma.

Background. The lip trill is a semi-occluded vocal tract exercise found to have positive outcomes on vocal parameters of healthy individuals after a single session. However, the effect of several lip trill sessions has not been studied.

Objective. This study investigated the effect of a 3- to 4-week lip trill exercise program on Maximum Phonation Time (MPT), Maximum Phonation Frequency Range (MPFR), Harmonics-to-Noise Ratio (HNR), and mean Speaking Fundamental Frequency (mean SFF).

Methods. Three vocally untrained healthy females with perceptually normal voices participated in a multiple-

baseline, single-case experimental research. Five to seven direct training sessions were randomly assigned. Self-implementation was encouraged thereafter. Participants were assessed on all outcome measures for 15 sessions. Data were visua-lized and inspected. Cohen's d was also derived using Standardized Mean Difference for single-subject research.

Results. Visual and statistical analyses revealed a decreased MPT when training was introduced, increased MPFR variability during the training phase, and increased stability in mean SFF post-training. Perceived effects include vocal freedom, decreased laryngeal stress, and vocal conditioning. Vocal outcomes in one participant yielded a significant effect on MPFR and mean SFF and a small effect on HNR.

Conclusion. There is evidence of lip trill effect on pitch control and vocal conditioning. Findings also revealed that motivation, exercise frequency, and adherence could contribute to positive gains in vocally healthy speakers. Further investigation in consideration of the study findings and limitations is warranted. **(Author's abstract)**

Keywords: *Lip trill, Prevention, Vocal health promotion, Acoustic vocal parameters, Normal voice, Medicine*

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NP

0337

Lithium as Pre-radioablative Treatment of Graves' Disease Complicated by Thyroid Storm and Methimazole-induced Agranulocytosis: A Case Report

Angeles, Roland Reuben B. , Tuazon, Cecileen Anne M. , Panuda, Jose Paolo P. , Ramiro, Valerie R., Isip-Tan, Iris Thi

Thyroid storm and thionamide-induced agranulocytosis are both rare and serious medical emergencies. We report a case of a patient in which these two rare events simultaneously occurred. A 33-year-old male, maintained on Methimazole for Graves' Disease, presented with fever, throat pain, and uncontrolled thyrotoxic symptoms. Methimazole was promptly discontinued. Thyroid storm was alternatively treated with lithium, hydrocortisone, and propranolol. Agranulocytosis was managed supportively with GCSF and empiric antibiotics. Lithium was maintained until after radioablation. When thionamides are contraindicated, lithium is a viable option for the acute management of thyroid storm and a bridge to definitive therapy. **(Author's summary)**

Keywords: *Lithium, Thyroid Storm, Methimazole, Agranulocytosis, Medicine*

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0338

Macroscopic fungal diversity in Northeastern Catanduanes, Philippines including some ecological notes

Angeles, Jr., Gregorio V. , Angeles, Jr., Raul T. , Tadiosa, Ed

A large forested section of northeastern Catanduanes comprised the Catanduanes Watershed Forest Reserve (CWFR) was surveyed for its macroscopic fungal diversity during the rainy season (September-December 2017). Transect line (TL) and quadrat methods were used, after which samples were collected, recorded and photographed. A total of 66 morphospecies of fungi belonging to 42 genera and 28 families from among 1,331

individuals collected were identified. With 58 belonging to the Basidiomycota and eight to the Ascomycota. All species represent new island records for Catanduanes. Based on Simpson's Diversity Index, the study area is deemed to host a low level of fungal diversity. **(Author's abstract)**

Keywords: *Ascomycopta, Basidiomycota, Macrofungi, Mycology, Watershed, Medicine*

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0339

Measurement of Anxiety and Depression Among Cancer Patients Seen in an Outpatient Clinic of a Tertiary Hospital Using the Validated Hospital Anxiety and Depression Scale – Pilipino Version (HADS-P)

Sacdalan, Dennis , Dela Rosa, Paolo , Samala, K

Background: Anxiety and depression, two of the most common affective disorders in cancer patients can affect one's compliance to treatment leading to poorer outcomes. Therefore, means of determining the psychological wellness of cancer patients through screening tools for anxiety and depression are an integral part of their management.

Objectives: 1) To measure the prevalence of anxiety and depression among cancer patients seen in an outpatient clinic of a tertiary hospital using the HADS-P. 2) To assess the impact of the following variables on symptoms of anxiety and depression: demographic, socio-economic, biological and health/clinical parameters.

Methodology: This is a cross-sectional analytic study involving 381 cancer patients seen in the outpatient clinic. Symptoms of anxiety and depression were measured using the HADS-P with an 11+ cut-off to identify possible cases of anxiety and depression. Univariate analysis, using STATA Version 13, was performed to identify correlates of anxiety and depression.

Results: The prevalence of anxiety, depression and mixed diagnosis (anxiety and depression) amongst this study population were 9.45%,4.72% & 2.89%, respectively. The multivariate analysis described non-college graduates (OR=1.82, CI 0.80-4.14), poor performance status (ECOG 2-3) (OR=5.34, CI 2.44-11.71) and the newly diagnosed and with ongoing treatment patients (OR= 12.02, CI 2.67-54.04 and OR=4.04, CI 0.88-18.58, respectively) as possible correlates of anxiety. Patients with poor performance status and have moderate-severe pain were likely to experience depression (OR= 6.14, CI 2.14-17.62; OR= 2.78, CI 0.92-8.46, respectively).

Conclusions: There are several factors that can affect one's predisposition to having affective disorders. Clearly, there is a necessity to allocate resources for screening and treating affective disorders among cancer patients to improve their compliance, to achieve a more holistic approach in their management and ultimately, to improve their quality of life. **(Author's abstract)**

Keywords: *Anxiety, Depression, Cancer patients, Hospital Anxiety and Depression Scale – Pilipino Version (HADS-P), Medicine*

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NP

Melioidosis as a Rare Cause of Deep Surgical Site Infection in a Filipino Patient with Metastatic Spinal Disease: A Case Report

Lim, Bryan Albert T. , Soco, Marc Lawre

Background: Melioidosis is a potentially fatal disease caused by Burkholderia pseudomallei. Over a century after its discovery, there seems to be a paucity of reported cases in the Philippines relative to other countries where it is found to be endemic. This suggests that the true burden of melioidosis in the country is not well-defined. The rarity of the disease, its protean clinical manifestations, and the lack of pathognomonic features pose a great diagnostic challenge. Furthermore, the proper recognition of the organism is an extreme necessity as it is intrinsically resistant to numerous antibiotics and requires specific long-term treatment.

Case: This is a case of a 49-year-old Filipino diagnosed with a metastatic spinal disease from a primary thyroid carcinoma and underwent posterior spinal decompression and stabilization. Revision of instrumentation was done following identification of an implant loosening. During the interim, wound dehiscence and infection developed. The patient was readmitted and underwent debridement of the lumbosacral spine. Wound cultures all yielded growth of Burkholderia pseudomallei. The patient received meropenem and then trimethoprim-sulfamethoxazole with ciprofloxacin during the intensive and eradication phase, respectively. Erythrocyte sedimentation rate and C-reactive protein were monitored and a significant reduction in both values reflected a good therapeutic response.

Conclusion: This is a rare case of a deep surgical site infection caused by Burkholderia pseudomallei. It is known that melioidosis is a potentially fatal infection but is under-reported in the Philippines. At present, further epidemiological studies along with an increased level of awareness of melioidosis are greatly needed to help define the true burden of illness and optimize patient management following prompt recognition. **(Author's abstract)**

Keywords: *Melioidosis, Philippines, Burkholderia pseudomallei, Medicine*

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0341

Mental Health and Coping Strategies of Filipino Healthcare Workers During the COVID-19 Pandemic

OÃ±ate, Pureza , Uson, Arnold John , Inocian, El

Objectives. This study aimed to determine the mental health of Filipino healthcare workers (HCWs) in terms of their feelings and ability to cope during the COVID-19 pandemic and the factors that motivated them to continue their work.

Methods and Results. This was a cross-sectional, descriptive survey, single-center study, conducted in Perpetual Succour Hospital, Cebu City, Philippines, within 3 months from the declaration of the COVID-19 pandemic. Of the 215 respondents, almost 50% thought of quitting their job due to fear of getting infected with COVID-19 and transmitting the disease to their families. Ninety-four percent (94%) of HCWs were nervous and scared and 85% were experiencing physical fatigue and emotional exhaustion. Despite all these, 97% of HCWs felt that their service during the pandemic was part of their professional obligation and ethical duty. HCWs coped with the present pandemic by strictly following safety protocols and the assurance of the safety of their families helped reduce their stress. Family support is their most important source of motivation.

Conclusion. Filipino HCWs experience physical and emotional stress during the COVID-19 pandemic but were motivated to work because of their professional obligation with an assurance of safety and support from their family. **(Author's abstract)**

Keywords: *Mental Health, Coping Strategies, Stress, Healthcare Workers, COVID-19, Medicine*

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NP

0342

Mental Health Outcomes among Health Care Workers exposed to COVID-19 in a Tertiary Government Hospital in Pangasinan

Sison, Teresita H. , Caramat, Donny M. , Villanueva-Misa, Ainstein Marie , Abalos,

Introduction: The Coronavirus disease 2019 (COVID-19) is a major health crisis that affected 32 million people to date and caused death to 990,000 individuals. The impact of this pandemic on the healthcare system took its toll especially to the healthcare workers and its effect on their physical and mental health. We aim to assess severity of generalized anxiety, depression and subjective distress among medical, allied and ancillary healthcare workers (HCWs) who handled COVID-19 patients.

Methodology: This is a cross sectional, survey-based study done from July 1 to August 31, 2020 involving healthcare workers who handled COVID-19 patients in a tertiary hospital in Pangasinan. The self-administered questionnaires used were the Generalized Anxiety Disorder- 7 for generalized anxiety, Patient Health Questionnaire (PHQ-9) for depression and Impact of Events Scale–Revised (IES-R) for subjective distress.

Results: A total of 417 of 450 contacted individuals completed the survey, with a participation rate of 92.67%. Majority were women (64.57%) and 53.24% were aged 19 to 30 years old. Sixty percent of the respondents were nurses, 25.9% were physicians and the rest were composed of medical technologists (6.47%), radiologic technologists (5.52%) and respiratory therapists (1.68%). Subjective distress was noted to be present in 253 (60.67%) healthcare workers followed by anxiety 224 (53.72%) and depression 184 (44.12%). Allied health professionals and male participants experienced anxiety the most as well as subjective distress. Depression was more severe among physicians (2 [1.85%]) and women (3 [1.1%]). Physicians and allied health professionals reported more severe degrees of mental health symptoms compared to nurses.

Conclusion: In this study, the proportion of HCWs who experienced subjective distress, generalized anxiety and depression were 60.67%, 53.72% and 44.12% respectively. Generalized anxiety and subjective distress were more severe in men and allied health professionals. Meanwhile, the more severe symptoms of depression were present in women and among physicians. **(Author's abstract)**

Keywords: *COVID-19,, Coronavirus, Depression, Distress, Anxiety, Mental health, Healthcare workers, Medicine*

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0343

Meta-analysis on the Role of Pregabalin in Fibromyalgia

Hamijoyo, Laniyati , Darmawan, Guntur , Rahmadi, Andr

Background: Fibromyalgia is a difficult-to-treat chronic musculoskeletal pain and tenderness syndrome. It is considered due to augmented pain processing in central nervous system. Interest in antiepileptic drugs, included pregabalin, for treatment of fibromyalgia is currently growing. This study aimed to investigate the effectiveness

of pregabalin for fibromyalgia.

Methods: We conducted the study according to the meta-analysis PRISMA guideline. Relevant randomized controlled trials (RCTs) were identified from a search of PubMed and Cochrane databases. Quality of selected studies was assessed using Jadad score for randomized placebo-controlled trials (RCT). Primary outcome was pain score reduction (30% and 50% reduction) and secondary outcome was patient global impression of change. Statistical analysis was performed using Review Manager 5.3.

Results: Six international, multicenter, high-quality RCTs with 8-15 weeks duration of treatment met inclusion criteria. Four studies used different fixed dose (300 mg/d, 450 mg/d, 600mg/d) and 2 studies used titrated dose in evaluating the efficacy of pregabalin. There was statistically significant benefit of pregabalin over placebo in mean pain score reduction [odds ratio (OR) 1.81, 95% confidence interval (CI) 1.56-2.10 $p < 0.00001$ in fixed dose pregabalin 30% pain reduction; OR 2.06 95% CI 1.66-2.56 $p < 0.00001$ in fixed dose pregabalin 50% pain reduction; OR 1.53 95% CI 1.10-2.13 p 0.01 in titrated dose pregabalin 30% pain reduction; OR 1.80 95% CI 1.12-2.88 p 0.01 in titrated dose pregabalin 50% pain reduction]. Pregabalin also demonstrated significantly better patient global impression of change than placebo. No heterogeneity was seen in most groups. No publication bias was observed.

Conclusion: Our study showed pregabalin monotherapy was effective for pain treatment associated with fibromyalgia. Further studies with longer treatment duration are needed to confirm the long-term effectiveness of pregabalin for fibromyalgia treatment. **(Author's abstract)**

Keywords: *Fibromyalgia, Pregabalin, Meta-analysis, Medicine*

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(Filipiniana Analytics)
NP

0344

Metastatic Follicular Thyroid Cancer to the Scapula with Rotator Cuff Muscles Involvement: A Case Report

Robles, Jeremyjones F. , Chavez, Sienna R

Background: Follicular carcinomas occur frequently in women beyond the 5th decade of life as a slow-growing thyroid nodule. They are known to invade locally and metastasize distantly. Common sites for distant metastases are lungs and bones. The bones often involved are axial skeleton such as vertebrae, sternum, and skull. Metastasis to scapula is an infrequent presentation and skeletal muscle metastasis is extremely rare.

Methods: Case Report

Results: We present a case of metastatic follicular thyroid carcinoma that manifested as a large scapular mass on the right shoulder of a 65-year-old female patient. MRI of the right shoulder revealed a large lobulated mass with central necrosis and non-delineation of the 4 rotator cuff muscles. Biopsy of the scapular mass revealed an invasive metastatic follicular carcinoma. A thyroid ultrasound showed a significant right thyroid nodule. The patient underwent total thyroidectomy and subsequent right total scapulectomy with biceps tendon transplantation attached to the clavicle. Histopathologic reports from both operations are consistent with invasive follicular thyroid carcinoma. The patient underwent radioiodine therapy. Follow-up showed no evidence of any functioning metastasis.

Conclusion: Soft tissue metastasis is an uncommon initial presentation of follicular thyroid carcinoma. Synchronous metastasis to the bone and soft tissue particularly on the right scapula and surrounding muscles is a rare occurrence that warrants this report. **(Author's abstract)**

Keywords: *Thyroid carcinoma, Bone metastasis, Soft tissue metastasis, Medicine*

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NP

0345

Neurosyphilis with Ocular Involvement in a Patient with Newly Diagnosed Human Immunodeficiency Virus (HIV) Infection: A Case Report

Tanque, Andre Angelo G. , Bajandi, Kristine Joy C. , Zamora, Rosally P. , Elinzano, Ma. Althea Kathrine B., Hufana, Ellalyne

Introduction: Syphilis is a chronic systemic infection caused by Treponema pallidum sub-species pallidum. Syphilis, by itself, already has a varied clinical presentation depending on the stage, earning its moniker as "the great imitator". In a patient without HIV infection, untreated syphilis presents as a chronic infection with primary, secondary, latent, and tertiary stages. With the emergence of the AIDS pandemic, HIV co-infection may significantly alter the clinical presentation of syphilis. This is a case of a patient with neurosyphilis with overlapping primary and secondary syphilis.

Case Presentation: This is a case of a 34-year-old Filipino male who came in due to blurring of vision. The patient's illness started six months prior to admission, when he noted the appearance of a painless, non-pruritic, solitary ulcer with erosions on his penis. A month after, he started to have progressive blurring of vision. In the interim,
erythematous, scaly plaques appeared on the dorsal aspect of both hands and feet, and on the tip of the nose, with associated thinning of hair on the scalp and eyebrows. The skin and penile lesions eventually increased in size and number. The examination of the pupils showed a 6 mm right pupil, non-reactive to light, and a 2 mm left pupil which was minimally reactive to light and constricts upon accommodation. The diagnosis of syphilis was confirmed by a reactive serum Rapid Plasma Reagin at 1:64 dilution, and a reactive serum Treponemal Enzyme Immunoassay. HIV screening was also reactive, with a CD4+ cell count of 15 cells/μL. Ophthalmologic findings were consistent with panuveitis. Skin punch biopsy revealed lichenoid and interstitial dermatitis with which syphilis was highly considered. Cranial CT imaging showed mild cerebral atrophy. Lumbar tap revealed a colorless, clear cerebrospinal fluid, with lymphocytic pleocytosis, normal protein, decreased glucose, and a reactive CSF RPR. The patient was given intravenous penicillin G 3 million units every 4 hours for 14 days, together with ophthalmic medications (prednisolone, levofloxacin, and atropine ophthalmic drops). He was also started on antiretroviral therapy. Prior to discharge, the patient was noted to have improved vision, skin lesions were significantly improved, and he was advised for close monitoring as outpatient.

Conclusion: Through this case, it was elaborated that with HIV co-infection, syphilis may present atypically—with multiple, persistent, primary lesions; with overlapping of the stages, and increased frequency of neurosyphilis presenting early into the infection. **(Author's abstract)**

Keywords: *Syphilis, Neurosyphilis, Ocular syphilis, HIV, HIV co-infection, Medicine*

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0346

Non-extraction Camouflage Treatment of Skeletal Class III Malocclusion

Triwardhani, Ari , Wardhana, Raden Aditya Wisnu , Anggitia,

Class III malocclusion can be defined as a skeletal facial deformity that is characterized by a forward mandibular position with respect to the cranial base and or the maxilla. We present a case of a 15-year-old man with skeletal Class III malocclusion who was treated with non-extraction orthodontic camouflage treatment using an orthodontic conventional technique. A fixed appliance, straight wire appliance (SWA) technique was used with a non-extraction treatment plan. Treatment was accompanied by intermaxillary Class III elastics. The total duration of active treatment was 23 months. There was a significant improvement in his occlusion, smile esthetics, and soft tissue profile pattern.
Orthodontic camouflage can be considered an effective therapy for correcting milder cases of skeletal C lass III malocclusion. **(Author's abstract)**

Keywords: *Non-extraction, Orthodontic camouflage, Skeletal Class III malocclusion, SWA technique, Medicine*

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0347

Non-extraction Treatment of Class II Division 2 Malocclusion with Cover Bite: A Case Report

Ramadhani, Syafira Dike Nur , Narmada, Ida Bagus, Martalia, Chi

Increased overbite has always been a challenging orthodontic problem in treating most periodontal-associated problems. This case report described the management of a class II division 2 malocclusion with cover bite without extraction. A 19-year-old female patient came with a chief complaint of irregularities on the anterior teeth. A fixed appliance was placed without extraction. The patient was instructed to use intermaxillary elastic band class II to correct the canine and molar relation. Treatment time was 16 months. A class I canine and molar relation with good interdigitation was achieved. The treatment of class II division 2 malocclusion without extraction in the adult patient showed promising results. **(Author's abstract)**

Keywords: *Angle Class II Malocclusion, Class II Malocclusion, Malocclusion Class II Division 2, Orthodontic Treatment, Medicine*

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(Filipiniana Analytics)
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0348

Non-Pharmacologic Nursing Interventions to Reduce Delirium Risk and Promote Quality Sleep

Hardin, Sonya R. , Munro, Cindy L. , Everhart, Erik , Mulkey, Malissa A., Olson, DaiWa

The average ICU patient sleeps less than two hours/day with as many as 61% reporting sleep deprivation, placing it among the most common ICU stressors. Sleep disturbances, lack of sleep and sleep disruption are common in older adults and a core risk factors for delirium. Significant reductions and fragmentation of sleep lead to an absence of restorative sleep. A significant amount of invasive care known to be a major risk contributor to the development of delirium occurs in the ICU. Nurses should be able to identify delirium risk factors earlier and contribute greatly to their prevention by promoting good sleep hygiene interventions. **(Author's abstract)**

Keywords: *Delirium, Sleep, Deprivation, Sedatives, Medications, Critical Illness, Geriatric, Sleep hygiene interventions, Medicine*

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2019 January to June,
(Filipiniana Analytics)
NP

0349

Nonsurgical Orthodontic Treatment in an Adult with Skeletal Class III Malocclusion Using Passive Self-ligating System: A Case Report

Suparwitri, Sri , Alhasyimi, Anan

Skeletal Class III malocclusion treatment is complex, especially when jaw deviations are serious. Camouflage treatment of skeletal Class III malocclusion improves prognosis with a slight-to-moderate functional shift. This report presents the case of a 23-year-old male with poor facial esthetics associated with chin protrusion and an uncomfortable bite. He had a concave profile, unfavorable incisor displays, protrusive lower lip, and strained lip closure. Camouflage therapy with a passive self-ligating (PSL) system through the anterior teeth of the maxilla protraction and arch expansion was used. After 14 months of treatment, the overjet outcome was positive. The teeth were arched, asymmetry was addressed, the convex profile and no deviation occurred when the jaw was closed. Factors in using the PSL system were low friction between the bracket and archwire, torque selection, and the significant dental arch expansion ability. The PSL system is an appropriate option in treating adults with skeletal Class III malocclusion to achieve a normal occlusion and a pleasant facial profile. **(Author's abstract)**

Keywords: *Skeletal Class III, Camouflage, Passive self-ligating, Medicine*

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(Filipiniana Analytics)
NP

0350

Normalizing Advanced Practice in Public Health Nursing in The Philippines: A Foucauldian Analysis

Abad, Peter James B. , Dones, Luz Barbara P. , Posadas, John

This study provides a closer look to the possibility of having advanced practice in public health nursing by analyzing the power relations between nursing practice and social structures. Representatives from the public health sector, national authorities, and the private sector were invited in a round table discussion. Transcriptions were coded and later on categorized and analyzed drawing upon the concepts of Foucault. Foucauldian analysis hands an important insight on how social structures and institutions can steer the creation of an advanced practice in public health nursing in the Philippines. Various social institutions view the relevance of a master's prepared nurse according to their societal roles and functions. Requisite competencies of a master's prepared nurse in public health nursing include fulfilling the role of a clinician, leader and manager, supervisor, and a researcher. PRBON, CHED, DOH, and nursing schools need to work together to define the knowledge of an advanced practice in public health nursing, to implement appropriate surveillance mechanisms, and to establish a compliant practice. **(Author's abstract)**

Keywords: *Advanced practice nursing, Public health nursing, Foucauldian analysis, Professional roles, Medicine*

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2019 July to December,
(Filipiniana Analytics)
NP

0351

Normotensive Pheochromocytoma Presenting as Adrenal Incidentaloma: A Case Report

Robles, Jeremyjones F. , Ong, Angeli Nic

Background: Pheochromocytomas are rare catecholamine-secreting tumors that usually present with hypertension and palpitations. However, a subset of pheochromocytoma patients is asymptomatic, presenting as adrenal incidentaloma on imaging.

Case: We present a case of a 32-year-old normotensive female who presented with a right suprarenal mass on abdominal ultrasound. Diagnosis of pheochromocytoma was made after biochemical testing revealed elevated 24-hour urine metanephrine of 1.96 mg/24hrs (NV:0-1 mg/24hrs) and epinephrine of 129 mcg/24hrs (NV: 2-24 mcg/24hrs). In addition, plasma chromogranin A was elevated at 225.38 ng/ml (NV:<100 ng/ml). CT scan of the abdomen showed a 3.0 x 4.0 x 3.0 cm heterogeneous well-circumscribed right adrenal mass, with 87Hu on contrast, an absolute washout of 21%, and a relative washout of 13% on a delayed scan. After adequate preoperative medical therapy with an alpha-adrenergic blocker, a right laparoscopic adrenalectomy was done, with histopathologic confirmation of pheochromocytoma. Repeat 24-hour urine metanephrine measurements done on multiple follow-ups after surgery were normal.

Conclusion: Asymptomatic pheochromocytoma should be included in the differential diagnoses of adrenal incidentalomas. As in our case, patients with normotension and adrenal incidentalomas should still undergo biochemical workup to rule out the presence of pheochromocytoma. Long-term complications from chronic exposure to high catecholamine levels lead to significant adverse cardiovascular effects. Early detection, adequate perioperative preparation, and timely surgical intervention can prevent a potential catastrophe. **(Author's abstract)**

Keywords: *Pheochromocytoma, Adrenal incidentaloma, Blood pressure, Filipino, Medicine*

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(Filipiniana Analytics)
NP

0352

Nurse Residency Program in the Philippines: A Policy Brief

Asto, Abraham B. , Labarinto,

This policy brief stems from the call to increase recruitment and hiring in the Philippine nursing service. It is important to consider the experiences of novice nurses in transitioning to the professional workforce. Bridging this gap leads to a direction of reinforcement or strengthening of competencies through a support system. Thereby, it is timely and relevant given the current situation of the nursing profession that a Nurse Residency Program (NRP) be proposed. The policy brief aims to reinforce technical knowledge and skills, enhance leadership and management skills, increase confidence in achieving the expected competencies, develop critical thinking and problem-solving skills, and deepen knowledge in health-related research among novice nurses. All these shall equip the novice nurse for a new role in a complex environment. The result of the Nurse Residency Program is

the achievement of quality of care, patient safety, and better health outcomes. Novice nurses who respond to the needs of the Filipino people with confidence and competence help maintain the health and well-being of the country towards sustainable development and growth. **(Author's abstract)**

Keywords: *Nurse Residency Program, Novice nurse, Training, Filipino nurses, Medicine*

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NP

0353

NURSE STAFFING DURING THE SARS, MERS, AND EBOLA EPIDEMICS: A NARRATIVE REVIEW

Tamayo, Reiner Lorenzo J. , Gilo, Ericka Louise C. , Tating, Dan Louie R

Background: The COVID-19 pandemic has put an immense strain on health systems worldwide. Nurses at the front line are prone to experience several staffing issues facing ever-increasing stresses to the health care system by a pandemic situation. The staffing experiences of nurses in this context can have a significant impact on current nursing practice and existing policies.

Objective: To carry out a synthesis of the scientific evidence available on the staffing experiences of nurses during the SARS, MERS, and Ebola epidemics.

Method: A narrative review was conducted. A literature search was carried out in PubMed, Scopus, and CINAHL databases. All studies describing nurses' experiences were included regardless of methodology. Atotal of 16 articles was included in the review.

Results: Narrative synthesis revealed ten themes from the results of the articles: training, staffing ratios and models, shifting models, volunteer staffing, skill mix, planning staffing needs, hospital preparedness, communication, effects of workload, and structured workflow processes.

Conclusions: Nurses are pivotal to the healthcare response to infectious disease pandemics and epidemics. The results of this review should provide a basis for nurse managers and administrators on how they can actively engage in supporting the staffing concerns and issues of nurses during the COVID-19 pandemic. **(Author's abstract)**

Keywords: *Nurse staffing, COVID-19, Pandemic, Narrative review, Medicine*

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2020,
(Filipiniana Analytics)
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0354

Nurse-Led Diabetes Clinic (NLDC) for a Comprehensive Diabetes Care Management

Gascon, Kalleitner Xyrus , Altuhaini, Anna Dianne , Samson, Je

Chronic disease is rapidly becoming a greater burden in the world and the leading cause of mortality because of epidemiological transformation. Diabetes is one; with 6.7 million deaths registered in 2021. In the Philippines, a report by the International Diabetes Foundation (IDF) projects the number of patients with Diabetes in 2030 to

reach 5.4 million and 7.5 million by 2045. Diabetes treatment in the Philippines is poor and challenging in terms of resources, government support, and economy. The national health insurance system does not have comprehensive diabetes care coverage and private insurance companies offer limited diabetes coverage. As a result, patients rely on "out-of-pocket" expenses for their laboratory testing and medications, and consequently, non- adherence to therapy. There is a need for an intervention in diabetes care management as Diabetes Mellitus (DM) prevalence posts an upward trend. This paper recommends the following policy statements to strengthen DM care management in a comprehensive, integrated, and coordinated nurse-led care system through "3Rs": "Reactivating" the health promotion activities; "Rephrasing" the existing care provisions; and "Re-establishing" care models that will boost the DM management care among the Filipinos. **(Author's abstract)**

Keywords: *Nurse-led clinic, Diabetes clinic, Diabetes care management, Advance Diabetes nurse, Advance Nursing Practice, Nurse Entrepreneur, Medicine*

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0355

Nurses' Knowledge, Attitudes, and Practices Regarding Postoperative Pain Management in Sri Lanka

De Silva, B.Sunil S. , Indika, M.S. , Hindagoda, H.M.P. , Kumara,

Purpose of the study: This study aimed to investigate the knowledge, attitudes, and practices regarding post-operative pain management among nurses working in the surgical units in Kandy, Sri Lanka.

Design: The study was based on quantitative method, specifically descriptive design. Samples were selected using the probability sampling technique of simple random sampling. The sample size obtained was 200 nurses using 95% confidence level and a 4% margin of error for a population of 300 nurses in the research setting.

Methods:A self-administered questionnaire was chosen as a data collection method, and this questionnaire contained 36 questions under four sub-topics. A box was kept in the matron office in the surgical section to collect the questionnaire. The data were analyzed using descriptive analysis with percentages.

Findings: According to the research findings, 66% (132) were knowledgeable about the meaning of post-operative pain management. Post-operative pain management was identified by 74% (148) of the respondents, and 26% (52) correctly indicated that the most accurate judge of post-operative pain is the patients' self-report. When considering the attitudes, 66% (132) of the participants agreed that post-operative patients show discomfort before receiving the next analgesics. Among the participants, 60% (120) of nurses worried that patients would become addicted to analgesics that they give, while 20% (40) disagreed, and 2% strongly disagreed. 54% (108) of the nurses stated that patients were kept under close observation and the pain was monitored regularly, while 46% (92) expressed that patient is kept in a comfortable position. To manage post-operative pain, 80% (160) used non-pharmacological methods while 20% (40) did not.

Conclusions: The findings of this study identified problems such as inadequate knowledge, and inappropriate attitudes and practices regarding postoperative pain management. **(Author's abstract)**

Keywords: *CaSPUN, Cancer survivor, Cross-cultural adaption, Indonesia, Needs assessment, Medicine*

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NP

0356

Nursing Workforce In The Philippines: Data And Issues

Pagsibigan, Jesusa S. , Balabagno, Araceli O. , Bonito, Sheila R., Sereneo, Kate Anjely

This study was conducted to: (1) determine the profile of nurses in various work settings based on available databases; (2) describe the current nursing education and programs in the Philippines; and (3) identify national key issues affecting the nursing workforce. The study utilized descriptive, cross-sectional research design; and employed institutional survey, Delphi survey, and round table discussions. Results showed that the Department of Health has the current number of nurses working in hospitals and communities in the different regions, including information on age and sex distribution, employment characteristics, and type of hospital affiliations. The Professional Regulations Commission Board of Nursing has the results of the national licensure examinations. Commission on Higher Education has information on BSN curriculum and schools. Priority key issues identified are: (1) nursing leadership and nursing role clarity, (2) workplace safety and violence, and (3) shortage of nurses, (4) unjust compensation, and (5) skills mix and geographic maldistribution. PNA is thought to have a big role in helping address these key issues. **(Author's abstract)**

Keywords: *Blood pressure, Urban poor, Health education, Lifestyle changes, Medicine*

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0357

Nutrition in Times of Crisis: A Qualitative Study in Siargao Island, Philippines, during the COVID-19 Pandemic

Zhang, Yunting , Suphanchaimat, Rapeepong , Leuangvilay, Phetdavanh , Compra, Julie Madelo , Yu, Vincen Gregory , Lasco, Gideon, Javier, Cha

Objectives. Despite the public-health significance of both malnutrition and crises, little has been done to explore the convergence of the two domains and develop ways to improve policies and practices, especially in rural communities. This article remedies that knowledge gap by focusing on nutrition-related changes, responses, and practices during crisis situations in Siargao Island, Philippines, using the COVID-19 pandemic as a backdrop.

Methods. Forty-six (46) semi-structured interviews were conducted among parents, caregivers, local health workers, and local officials of Del Carmen, Siargao Island. Principles of thematic analysis were applied to data analysis using NVivo 12. Afterwards, the preliminary data were presented in a virtual validation session with the local community and stakeholders.

Results. Despite the high prevalence of malnutrition amid a backdrop of economic and nutritional difficulties, the community members generally viewed their children as healthy. Rice remained (disproportionately) central to people's diets; possible alternatives like root crops were considered emergency foods only and not culturally acceptable as staples, in spite of their cheap and ubiquitous nature. Lastly, the economic and financial repercussions of the COVID-19 pandemic have also negatively affected the community members' overall nutrition and food sources.

Conclusion. More efforts should be directed toward encouraging the consumption of root vegetables and fruits as rice alternatives in everyday diet-a cost-effective strategy that would also promote dietary diversification. More importantly, nutrition responses should consider local food systems in terms of specific local economies and geographies, while health promotion efforts should engage with local notions of 'health' and 'nutrition' and encourage community participation in (re)designing policy interventions. **(Author's abstract)**

Keywords: *Nutrition, Public health, Rice, Root crops, Siargao Island, COVID-19, Medicine*

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NP

0358

Online learning in Nursing: Concept Analysis

De Guzman, Cathlene

Online learning in nursing is a controversial idea that is viewed as a hindrance to the holistic learning of an individual, however, it was the only solution to prioritize the safety of students during the COVID-19 pandemic. This concepts aims to give a clear approach to how online learning will occur successfully in nursing education. The method used in intellectualizing the concept was Walker and Avant's approach. The attributes of online learning involve: 1.) platform with the use of devices to create a classroom community; 2.) virtual schooling at home; 3.) entertainment and leisure activity; and 4.) enhanced with synchronous online classes and asynchronous video instruction. Apart from these attributes, the schema of nursing students needs to be addressed and enhanced through the delivery of learning by giving importance to visual, audio, read and/or writing, and kinesthetic learning styles fueled with the right attitude and technological competency. **(Author's abstract)**

Keywords: *Online Learning, Nursing education, Nursing, Medicine*

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NP

0359

Paraparesis in a Young Adult: A Case Report on Neurofibromatosis-2

Robles, Jeremyjones F. , Maglinte, Bayani Pocholo T. , Colasito, Tris

Background: Neurofibromatosis-2 (NF2) is a rare neurocutaneous syndrome that typically presents with hearing loss, tinnitus, or weakness associated with few subcutaneous nodules. In contrast to neurofibromatosis-1 (NF1), NF2 presents clinically with more central lesions rather than peripheral lesions. The presence of bilateral vestibular schwannomas through imaging studies distinguishes NF2 from other neurocutaneous syndromes.

Case: This is a case of an 18-year-old male who presented with lower paraparesis with associated hearing loss, cataract, and a few subcutaneous nodules. Centrally located lesions were suspected, thus brain and spine magnetic resonance imaging (MRI) were done revealing bilateral vestibular schwannomas and spine neurofibromas. The patient and family were advised for tumor surveillance, and apprised of surgical intervention once with brainstem compression symptoms.

Conclusion: NF2 is a rare debilitating disease that may lead to multiple neurologic deficits. The absence of recommended medical treatment and the multifocality of the tumors leave surgical resection a high-risk treatment option. Early recognition by tumor surveillance may give patients with NF2 a better prognosis and survivability. **(Author's abstract)**

Keywords: *Neurofibromatosis, Schwannomas, Neurofibromas, Paraparesis, Bevacizumab, Medicine*

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0360

Parental Feeding Style of Mothers in the Province of Ilocos Sur

Arde, Jr., Bernardo Oliber A., De Vera, Marciana

The increasing trend of childhood obesity is becoming an imminent concern in both developed and developing countries. Besides genetic predisposition, environmental and social factors are contributory factors to this global epidemic. These factors include maternal feeding practices and style. This study determined mothers' parental feeding styles in the province of Ilocos Sur and the factors that predict them. Also, the study ascertained if parental feeding styles are related to the child's Body Mass Index (BMI).

This study used the descriptive-correlational research method and included 156 mothers with children aged 2-3. Respondents were chosen purposively. The Parental Feeding Style Questionnaire developed by Wardle et al. (2002) was used to gather the needed data. For data analysis, the frequency and percentage, mean, multiple regression, and Pearson product-moment of correlation were used.

This study concluded that mothers vary in their characteristics and so on their feeding styles. Based on study results, they have high levels of encouragement and emotional feeding and average levels of instrumental feeding and control over feeding. However, encouragement feeding is the dominant feeding style among respondents among the four feeding styles. Various maternal traits have been found to predict a specific parental feeding style except for the control over feeding subscale. Additionally, only encouragement feeding was found to have an indirect correlation with a child's BMI. **(Author's abstract)**

Keywords: *Feeding practices, Maternal factors, Nutritional status, Medicine*

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0361

Paternal Care during Miscarriage: A Concept Analysis

Osei, Simon

Caring is the fundamental essence of nursing practice. Swanson's theory of caring provides the process of care for women who have experienced miscarriage. However, there is a gap in theory and knowledge in providing care to fathers experiencing a miscarriage. Studies have shown that the experience of fathers during a miscarriage is different from their wives. According to Jones et al (2019), fathers' experience during a neonatal loss is different from their partners. They feel isolated. Thus, men feel that they are disconnected from their partners, and also are not involved in the caring process, are overwhelmed by the situation, fathers feel that the role fathers play as a protector for their partner was not done well and they experience a lack of support from healthcare providers during that period. This concept of paternal care during a miscarriage is to help fathers who are experiencing neonatal loss by applying the appropriate nursing action to provide the necessary nursing care. The concept analysis methodology from Walker and Avant (2005) would define the concept, attributes, antecedents, consequences, cases, and empirical referent on paternal care during a miscarriage. This paper concludes that providing paternal care to fathers during miscarriage helps them deal with the loss and understand the process they are going through. Therefore, there is a need to develop a theory that provides the care process to fathers going through a miscarriage. Hence, the theory of paternal care during a miscarriage is proposed. **(Author's abstract)**

Keywords: *Paternal care, Miscarriage, Caring, Child loss, Medicine*

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0362

Patients' Experiences and Level of Satisfaction on the Care Rendered by Student Nurses

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Understanding the patients' views on the care they receive is essential for the development of quality health care services. The study aimed to determine the patients' experiences and level of satisfaction on the care rendered by student nurses in the medical and surgical wards of a private hospital . Furthermore, it determined any significant difference in the patients' experiences and level of satisfaction when grouped according to demographic variables.

A descriptive research design was utilized in the study. The participants were recruited from the medical and surgical wards of the hospital from September 5 to October 15, 2016. A total of 100 patients who received care from the student nurses for a minimum of 2 days were included in the study.

The Newcastle Satisfaction with Nursing Scale (NSNS) was used to determine the patients' experiences and level of satisfaction on the care rendered by student nurses. Frequency, percentage, mean score, T-test, and ANOVAwere utilized for the data analysis.

Results showed that patients' experiences were above good (category mean of 4.97) and were completely satisfied (category mean of 3.53) with the care rendered by the student nurses. Asignificant difference was also found between the highest educational attainment and patients' experiences ($P< 0.05$). These findings are important in improving the quality of care rendered to the patients by student nurses. Furthermore, it helps the nursing education in determining and enhancing the competencies of the students in some focused areas. **(Author's abstract)**

Keywords: *Patients\' experiences, Patients\' satisfaction, Care, Student nurses, Medicine*

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0363

Pediatric Neurology Patients: Parental Awareness of Adverse Effects of Long-term Corticosteroid Therapy

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Background: Corticosteroids are potent medications used to treat many inflammatory conditions in paediatric neurology practice. Although corticosteroids are beneficial, their adverse effects may be numerous and varied. As parents are the primary caregivers of paediatric patients, assessing their awareness is important.

Methods: To determine the parental awareness on the adverse effects of corticosteroid therapy in Paediatric

Neurology Patients in the Neurology Unit at the Lady Ridgeway Hospital, Colombo, Sri Lanka, this descriptive cross-sectional study, looked at 300 parents of paediatric neurology patients on long-term corticosteroid therapy. Parents volunteered for the study and signed with informed consent. Ethical approval was obtained from the Ethics Review Committee of the same hospital. Data were collected using content validated, pre-tested self-administered questionnaire during January to March 2020.

Results: Of the total parents, the majority were mothers (87%, n=262) and more than 70% (n=211) of them completed their secondary education. Findings demonstrated that parents had average awareness about adverse effects of long-term steroid therapy including child's susceptibility to infections (69.0%, n=207), increase blood glucose levels (69.7%, n=209), moon face (60.3%. n=181), central obesity (60.3%, n=181), increase blood pressure levels (58.0%, n=174) and (irritability 50.3%, n=151) while poor awareness on adverse effects include buffalo humps (26.7%, n=80) increase fracture tendency (24.3%, n=73), tarry colour stools (24.3%, n=73), vision impairment (24.0%, n=72), glaucoma (17.3%, n=52), cataract (16.0%, n=48) and delayed wound healing (23.0%, n=69). According to the findings, overall mean (SD) knowledge percentage on parental awareness of adverse effects was found to be low (38.24 ± 20.57).

Conclusion: Since parental awareness of the adverse effects of long-term corticosteroid therapy is inconsistent, special attention is needed to plan and implement appropriate awareness sessions. **(Author's abstract)**

Keywords: *Medicine, Paediatric neurology patients, Corticosteroid therapy, Parental awareness, Adverse effects*

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0364

Perceived Social Support from Family, Friends and Spiritual Experiences as Correlates of Depression

Catu, Louie

Depression is the origin of ill health problems in college students. It advances as one of the leading causes of mental health issues. During their college life, freshmen encounter many firsts. These include a new environment, friends, exposure to social norms and culture. The students may struggle and experience difficulty if they cannot deal with these challenges. They can become a vulnerable population. Therefore, the overall purpose of this study is to conduct a baseline assessment of college students' experiences in the university. More so, this study 1) describes the characteristics of a sample of freshmen allied medical sciences students, 2) describes the levels of perceived social support from family and friends, spiritual experiences, and depressive symptomatology among allied medical sciences freshmen; and 3) to assesses the possible association among described positive influences (spirituality, family support, peer support) to depressive symptomatology. The study utilized a cross-sectional analytic quantitative design. In selecting respondents, a consecutive sampling technique was utilized. Respondents eligible to participate included first-year full-time students in the university taking up Bachelor of Science in Nursing (BSN), Bachelor of Medical Technologist (BSMT), and Bachelor of Science in Radiological Technologist (BSRT). A total of 110 undergraduate students participated in the study. Most of the students were females younger than 20 years old. The overall perceived social support from family and friends yielded average scores. The higher the scores, the greater the perception of social support from family and friends. For their spirituality, it showed that participants scored lower, indicating a high level of spiritual experiences. Lastly, the depression scale yielded high scores indicating that the participants had signs of severe/major depression, as based on the Center for Epidemiologic Studies Depression (CES-D) scoring. The relationships between Depressive Symptoms and Perceived Social Support from Family (PSS-Family) and Friends (PSS-Friends), and Spirituality Experiences were also evaluated. It showed that Depression and PSS-Friends yielded a statistically significant relationship. However, there was no statistically significant relationship between Depression and PSS-Family. For the spirituality experiences, the test revealed that there is also a statistically significant relationship with depression. Overall, the study concludes that college life is a period of increased challenge for young allied medical health students. Their courses accompany complex and challenging responsibilities that increase tensions

and anxiety. The results from these processes may cause or worsen stress when not given priority and could lead to depressive symptomatology. It was reflected that freshmen students' peer support and spiritual experiences appear to be closely associated with depressive symptomatology. **(Author's abstract)**

Keywords: *Allied medical sciences students, Perceived social support, Spirituality, Depression, Medicine*

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NP

0365

Peritoneal Dialysis for Refractory Heart Failure from a Congenitally Corrected Transposition of the Great Arteries who has not Undergone Definitive Surgery: A Case Report

Estacio, Agnes D. Mejia, Ronaldo H. , Manalili, Sheryll A

Heart failure (HF) is a major cause of significant morbidity, mortality, and hospitalization worldwide including the Philippines. Congenitally corrected transposition of the great arteries (C-TGA) occurs when the right atrium enters the morphological left ventricle which gives rise to the pulmonary artery and the left atrium communicates with the right ventricle which gives rise to the aorta. Heart failure can occur in C-TGA especially if associated with other heart defects. Ideal management is anatomic correction via surgery to prevent or address heart failure. Peritoneal dialysis has been used as a therapeutic intervention for patients with refractory heart failure and kidney injury with or without kidney failure due to its gentler fluid removal compared to conventional ultrafiltration resulting in less myocardial stunning and neurohormonal activation. We present the case of a patient with heart failure who started on peritoneal dialysis (PD) as an adjunct therapy for fluid management after failing to satisfactorily achieve volume control with diuretics.

The patient is a 56-year-old man with C-TGA admitted for decompensated heart failure. He was initially treated with intravenous diuretics on the first admission but was readmitted after 3 months for decompensation this time with borderline low blood pressure making diuresis difficult. The patient was given loop diuretics, tolvaptan, and angiotensin receptor neprilysin inhibitor (ARNI) but still with decreasing trends in urine output and ina dequate
symptom control. PD was initiated before discharge with subsequent improvement in heart failure symp toms. The patient was on regular follow-up for PD maintenance and titration of heart failure medication.

In this case report, we have shown how PD can be an effective adjunct to guideline-directed medical therapy in patients with severely symptomatic heart failure who have an unstable hemodynamic status and for which volume management cannot be satisfactorily achieved with diuretics. **(Author's abstract)**

Keywords: *Peritoneal dialysis, Heart failure, Congenital heart disease, Congenitally corrected transposition of the great arteries, Diuresis, Ultrafiltration, Medicine*

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NP

0366

Polycystic Ovarian Syndrome: Association of Phenotypes with Prediabetes and Diabetes Mellitus Type 2: A Cross-Sectional study

Bustos, Rhodora D. , Capellan, Maria Leonora D. , Aviles, Edna

Introduction: Polycystic ovarian syndrome (PCOS) has been recognized as a risk factor for metabolic dysfunction. The objective of this study was to determine the association of each PCOS phenotype with the risk for prediabetes and diabetes mellitus (DM).

Methods: This was a cross-sectional study by chart review of PCOS patients classified into 4 phenotypes, who consulted at outpatient clinics in Makati Medical Center. Odds ratio using logistic regression was used to determine association between the PCOS phenotype and having prediabetes or DM Type 2.

Results: One hundred thirty-four records of eligible females diagnosed with PCOS classified as Phenotype D (52%), Phenotype A (22%), Phenotype C (19%) and Phenotype B (7.5%), were included. Pre-diabetes was diagnosed in 39.6%, and DM type 2 in 7.5% of the women. Univariate association of phenotype and outcome revealed that DM is significantly more common among phenotypes A and D while prediabetes is significantly most common among phenotype D. However, multivariate regression did not show any positive association between phenotypes and risk for prediabetes and DM.

Conclusion: Phenotypes A and C were significantly negatively associated with the risk of prediabetes or DM type 2. Obesity and abdominal adiposity were aggravating factors that increased metabolic risk. **(Author's abstract)**

Keywords: *PCOS phenotypes, Prevalence, Diabetes mellitus, Prediabetes, Medicine*

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NP

0367

A Population-based Cross-sectional Study of the Status of Diabetes Care in the Philippines (PhilDiabCare 2020)

Fernando, Richard Elwyn , Tan, Rima T. , SobrepeÃ±a, Leorino M. , Panelo, Araceli A. , Ang, Ernesto L., Lim, Marcelo A. , Juangco, Jose Ronil

Background. Worldwide, diabetes mellitus (DM) is a serious health issue with a global prevalence of 9.8% in 2021. According to the latest 2018 Expanded National Health and Nutrition survey done by the DOST-FNRI, the prevalence of diabetes in the Philippines have more than doubled from 3.4% in 2003 to 7.9% in 2018. The latest research conducted regarding diabetes care in the Philippines was in 2008 which showed that 85% of patients with diabetes failed to achieve the HbA1c general target of <7%.

Objectives. A population-based cross-sectional study to update the current status of diabetes care in the Philippines, specifically to determine glycemic control, trends in DM management, prevalence of complications and lastly their clinico- socio demographic profile.

Methods. 340 patients with diabetes were included from the clinics of the Institute for Studies on Diabetes Foundation, Inc. physicians. The following data were collected: clinico-socio demographic profile, HbA1C-based glycemic control, trend in the use of glucose lowering agents, and prevalence of diabetes complications.

Results. The mean age of the 340 patients with diabetes in this study was 62 years old. Almost sixty-seven percent (66.8%) were females. The mean body mass index was 26 kg/m2. The mean duration of diabetes was 12.63 years. Close to sixty- eight percent (67.6%) had tertiary education, 58.8% were unemployed and 65% had above minimum income.

The most commonly used single oral agent was biguanide (72.9%), followed by dipeptidyl peptidase-4 inhibitors (64.3%). The most common dual therapy combinations were biguanide plus dipeptidyl peptidase-4 inhibitors (43.2%), biguanide plus sulfonylureas (27.2%), and biguanide plus sodium-glucose co-transporter-2 inhibitors (11.1%). Basal insulin was the most commonly used injectable agent.

The present study showed that 47.4% of patients achieved an HbA1c of <7%. For the microvascular complication group alone, most had neuropathy (30.4%) followed by nephropathy (17.3%) and by retinopathy (5.4%). For the macrovascular complication group, the most common was coronary artery disease (82%) followed by peripheral artery disease and DM foot (27%). Overall, the most frequent DM complication identified was neuropathy (30.4%) , nephropathy (17.3%) and coronary heart disease (16.1%).

Discussion. Compared to the 2008 study, oral glucose lowering agents' usage shifted from sulfonylureas to more use of dipeptidyl peptidase-4 inhibitors. There was a decline in the use of thiazolidinediones, α-glucosidase inhibitors and non- use of meglitinides. For insulin use, there was a shift from the use of premixed insulin to more basal insulin usage.

There was marked improvement in the diabetes care situation in the Philippines from the 2008 study to the 2020 study. Glycemic control defined as HbA1c level of <7.0 increased from 15% to 47.4%. Coronary artery disease was the most common macrovascular complication while neuropathy was the most common overall and microvascular complication. **(Author's abstract)**

Keywords: *HbA1c, Diabetes Complications, PhilDiabCare, Glycemic Control, T2DM, Comorbidities, Management, Medicine*

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NP

0368

Post-operative Aspirin in preventing early renal allograft thrombosis: A Meta-Analysis

Naidas, Maria Ana Louise M. , Camenforte, Jameel Kristine L. , Guevara, Daniel Y., Villanueva, Anthony Russel

Background: Kidney transplantation (KT) remains to be the preferred mode of renal replacement therapy as it offers the best clinical outcomes, a better quality of life, and lesser complications compared to dialysis. However, KT still carries a number of complications, one of which is graft thrombosis. Despite advancements in treatment, graft thrombosis is still an important cause of early graft loss. Prevention therefore, is of significance. A growing number of evidence suggests that low-dose aspirin has a role in the primary prevention of allograft thrombosis.

Research Question: Among renal transplant recipients, does postoperative aspirin prevent early renal allograft thrombosis?

Objective: To conduct a meta-analysis to determine the effect of postoperative aspirin on preventing renal allograft thrombosis.

Methods: A systematic search of PubMed, Google Scholar, CENTRAL, and clinicaltrials.gov was done by two independent authors. All randomized and non-randomized studies determining the effect of postoperative aspirin on renal vein/allograft thrombosis were reviewed for eligibility and quality assessment. Studies on both adult and pediatric kidney transplant recipients were included.

Results: Five non-randomized cohort studies (3 in adults, 2 in children) with a total of 2,393 patients were included. Using the Newcastle-Ottawa scale, two studies were found to have good quality, while three had poor quality. In a fixed-effects meta-analysis, aspirin was associated with a reduced risk for renal allograft thrombosis in adults (RR 0.13; 95% CI 0.06, 0.28; I2 22%) and children (RR 0.11; 95% CI 0.03, 0.40; I^2 0%).

Conclusion: Post-operative aspirin was associated with reduced risk for renal allograft thrombosis in both adults and children. However, the best available evidence is limited to observational studies. A well-designed randomized controlled trial is needed to confirm this finding. **(Author's abstract)**

Keywords: *Aspirin, Renal vein thrombosis, Renal allograft thrombosis, Medicine*

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NP

0369

Prenatal and Postnatal Interventions and Neonatal Mortality among Adolescent Pregnancies in the Cordillera Administrative Region

Pascua, Jona

Background: Adolescent pregnancy remains a significant public health problem in the Philippines wherein teenage pregnancy has been declared as a National Social Emergency.

Objectives: This study aims to identify the received services and interventions during prenatal and postnatal visits and investigate the relationships between the received services and interventions during visits and the completeness of received services to neonatal death among adolescent pregnancies in the Cordillera Administrative Region.

Methods: This study used a descriptive correlational study design. A survey questionnaire was distributed to target participants among selected municipalities in the Cordillera Administrative Region and asked about the received services/interventions during and after pregnancy. Responses were analyzed using frequency and percentage, Chi-square and Phi Correlation Coefficient.

Results: The study showed that a high incidence of neonatal deaths occurs during the first delivery while decreasing prenatal and post-natal visits have been noted. It was also observed that neonatal mortality is high particularly among the category of middle adolescents. The study also demonstrated a significant correlation between Blood Testing and Measurement of the Abdomen or fundal height measurement provided to the respondents and neonatal mortality in the third trimester. However, no significant correlation coefficients have been noted between neonatal mortality and completeness of prenatal and postnatal services.

Conclusion: Policies and programs on adolescent health development should be enhanced, first, to focus on preventing adolescent pregnancy and repeat pregnancies during the adolescent period, while strengthening the access to health services for all pregnant women, especially adolescent mothers. **(Author's abstract)**

Keywords: *Adolescent Pregnancy, Neonatal Mortality, Primary Health Care Services, Interventions, Medicine*

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NP

0370

Pre-operative Glycosylated Hemoglobin Level and Fasting Blood Sugar as Markers for Risk of Acute Kidney Injury in the Immediate Post-Operative Period Among Type 2

Diabetic Patients After Elective Abdominal Surgery

Bisquera, Mary Rose Y. , Oliva, Andrea Marie M. , Isidro, Maria Jocelyn C. , Evangelista, Lisa Angel

Objectives. The study aimed to identify whether pre-operative glycosylated hemoglobin level (HbA1c) and fasting blood sugar (FBS) can be used as markers for the development of acute kidney injury (AKI) in the immediate post-operative period of type 2 diabetic patients after elective abdominal surgery.

Methods. This retrospective cohort pilot study included seventy-four diabetic patients who underwent elective abdominal surgery from 2015 to 2018. HbA1c and FBS, demographic data, comorbidities, type and indication of surgery, and treatment history were correlated with the development of AKI using logistic regression analysis.

Results. In this cohort, 12% of subjects developed AKI. Univariate and multivariate logistic regression analysis, however, showed that neither HbA1c and FBS nor other studied factors were predictive for the occurrence of AKI (OR 2.55, p= 0.26 and OR 0.64, p= 0.72 respectively).

Conclusion. Pre-operative HbA1c and one-time FBS values in diabetic patients undergoing elective abdominal surgery procedures were not statistically predictive of AKI in the present data. However, the observed trend towards the risk of AKI among the elevated HbA1c subset of patients should drive further studies with a greater sample size and of a prospective nature looking at other metabolic factors contributing to AKI. **(Author's abstract)**

Keywords: *Pre-operative Glycosylated Hemoglobin level, Fasting Blood Sugar, Acute Kidney Injury, Medicine*

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NP

0371

The Prevalence and Analysis of Related Factors of Anxiety, Depression, and Quality of Life of Out-Patients in the Cancer Institute of a COVID-19 Referral Tertiary Hospital: One Year into the Pandemic

Chiu, Harold Henrison C. , Larrazabal, Jr., Ramon B. , Sandoval-Tan, Jenni

Objective. This study aimed to determine the prevalence, analyze, and compare the risk factors of anxiety, depression, and quality of life of cancer patients in the out-patient cancer clinic of the Cancer Institute one year into the pandemic. These were compared to the prevalence of anxiety and depression before the pandemic.

Methods. A cross-sectional analytic study described the prevalence of anxiety, depression, and quality of life and analysis of its related factors among patients with cancer seen in the outpatient cancer clinic of the Cancer Institute of the Philippine General Hospital from November 1 to 20, 2021, using the Hospital Anxiety and Depression Scale – Pilipino and EORTC (European Organisation for Research and Treatment of Cancer) QLQ-C30 (Quality of Life questionnaire) tools.

Results. A total of 408 cancer patients were enrolled in the study. The prevalence of anxiety and depression was 58.33% and 24.51%, respectively. Before the pandemic, the prevalence of anxiety and depression was 9.45% and 4.72%, respectively. Two hundred seventy participants (66.18%) had a positive quality of life. The comparison between the prevalence of anxiety and depression between this study (one year into the pandemic) and the pre-pandemic study revealed a statistically significant difference in the majority of both, with more anxious and depressed cancer patients in this study. The participants agreed that the pandemic had affected their daily activities.

Conclusion. The study showed that the COVID-19 pandemic significantly increased anxiety and depression among cancer patients. The quality of life (QOL) of cancer patients in this study has not been distinctly affected by the pandemic, but for those who have, they still require the attention and support of not just the physicians but

the community as a whole. Our findings highlight the need to integrate better psychosocial support and the important role of carers in the evolving pandemic response measures. **(Author's abstract)**

Keywords: *Cancer outpatients, Pandemic, Anxiety, Depression, Quality of life, Cancer, COVID-19, Medicine*

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0372

Prevalence and Associated Clinical Factors of Gastro-esophageal Reflux Disease in Filipino Hemodialysis Patients: A Cross Sectional Study

Co, Mark Isaiah , Takahashi, Kento, Apostol-Alday, Angela , De Aquino, Al

Introduction: Reflux is one of the most common gastrointestinal symptoms among dialysis patients. This may be associated with several clinical factors such as comorbidities and subsequent polypharmacy. However, this remains unrecognized and untreated.

Objectives: The objectives of this study were to determine the prevalence of Gastroesophageal Reflux Disease (GERD) in Filipino patients on maintenance hemodialysis (HD) and to investigate associated demographic, clinical, and renal profiles of HD patients with and without GERD.

Methods: This was a cross-sectional, multicenter study using a validated GERD questionnaire (GERDQ) translated into Filipino. Patients above 18 years old undergoing hemodialysis as outpatients were included. Several clinical factors such as demographic, clinical, and renal profiles were analyzed based on the absence and presence of GERD with a predetermined cut-off value of eight or above.

Results: Included in our analysis were 264 patients, from which 36 had GERDQ score of ≥ 8 (13.64% 95%CI 9.98-18.35). Factors associated with having score of ≥ 8 included the following: (1) having chronic heart disease or CHD (COR 4.041, 95%CI 1.89-8.64, p<0.001), (2) being on insulin (COR 2.599, 95%CI 1.25-5.42, p=0.011), (3) anemia (COR 4.508, 95%CI 1.91-10.64, p=0.001) (4) diagnosis of both hypertensive kidney disease and diabetes kidney disease (COR 3.853, 95%CI 1.15-12.96, p=0.029), (5) previous diagnosis of GERD (COR 6.655, 95%CI 3.18-13.91, p<0.001), (6) previous intake of antacids (COR 2.622, 95%CI 1.17-5.89, p=0.020), (7) being employed (COR 2.332, 95%CI 1.15-4.75, p=0.020) (8) alcohol consumption (COR 2.477, 95%CI 1.23-5.01, p=0.012), and (9) smoking (COR 2.405, 95%CI 1.19-4.86, p=0.014).

Conclusion: In our study, the prevalence of GERD in Filipino HD patients was 13.64% and may be associated with several clinical factors such as heart disease, insulin use, anemia, hypertension, diabetic kidney disease, previous diagnosis of GERD, use of antacids, being employed, smoking, and alcohol use. A comprehensive understanding of the relationships between these clinical factors awaits further studies in a larger number of patients. **(Author's abstract)**

Keywords: *GERD, GERDQ, Filipino translation, Chronic Kidney Disease, Hemodialysis, Medicine*

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0373

Prevalence and Clinical Outcomes of Patients with Diabetic Ketoacidosis/Hyperglycemic Hyperosmolar Syndrome and COVID-19: A Systematic Review

Cunanan, Elaine C. , Caro, Marilyn Katrina C. , Villamonte, Sh

BACKGROUND AND OBJECTIVES. Several reports have shown that coexistence of diabetes mellitus and COVID-19 is one of the risk factors for poor outcome and increased mortality. Rapid metabolic deterioration with development of diabetic ketoacidosis (DKA) or hyperglycemic hyperosmolar syndrome (HHS) may result due to the acute insulin secretory capacity loss, stress condition and the cytokine storm. In this review, we aim to describe the prevalence of hyperglycemic crises (DKA/HHS) in patients with COVID-19 infection as well as their clinical outcomes.

METHODS. An intensive search was done using the WebMD, PubMed, Medline and Google Scholar databases for articles published between December 2019 to October 2020 that identified the number of patients who developed DKA and/or HHS among those who were admitted for COVID-19. Their clinical outcomes were likewise described.

RESULTS. This review included 4 articles in which individual quality was assessed. A total of 1282 patients were admitted for COVID-19 and the prevalence of DKA was 1.32%. HHS was not reported in any of the studies. Five (29.4%) of the patients with DKA and COVID-19 died and 12 (70.6%) recovered.

CONCLUSIONS. A significant number of COVID-19 patients developed DKA and it is associated with a high mortality rate. This reimposes the need for an appropriate algorithm for the optimal management of concomitant COVID 19 and hyperglycemic crises to avoid morbidity and mortality. Additionally, there is paucity of large-scale studies describing the prevalence of DKA/HHS in patients with COVID-19. **(Author's abstract)**

Keywords: *Diabetic ketoacidosis, Diabetic hyperosmolar syndrome, COVID-19, Medicine*

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0374

The Prevalence of Non-Alcoholic Fatty Liver Disease and its Association with Glycemic Control in Type 2 Diabetes Mellitus Patients at the Batangas Medical Center-Out-Patient Department

Santos, Florence A. , Anzo, Ferdin

Background: Diabetes mellitus is a chronic disease which has been increasing both in incidence and global impact. In the Philippines, cases of diabetes mellitus increase at an alarming rate. Previous study in Nigeria among Type 2 Diabetic patients with non-alcoholic fatty liver disease (NAFLD) has observed an increased prevalence of 69%. However, there is no definite association between severity of NAFLD and glycemic control (HbA1c).

Objectives: To investigate the prevalence of NAFLD and its association with glycemic control of Type 2 Diabetes Mellitus (T2DM) patients at Batangas Medical Center (BatMC) – Out Patient Department (OPD).

Methods: A single center, cross sectional study was performed on 80 T2DM patients, who underwent OPD consultation between November 2020 to October 2021. Clinicodemographic profile, duration of T2DM, diagnostic tests including HbA1c and ultrasound of the liver were taken. *Chi-Square* test of homogeneity and *Fisher's Exact test/Fisher-Freeman-Halton* test were utilized for comparison of categorical variables from a single population to determine whether there is a significant association between the severity of NAFLD and patients characteristics and glycemic control.

Results: 80 T2DM patients were included in the analysis, there was an equal number of male (50%) and female (50%). Majority of the patients were in the age of 50 – 59 years old (33%), with a BMI of 25 and above (81%), had been diagnosed with T2DM for > 5 years (72%) and maintained with oral hypoglycemic agents (68%). The prevalence of NAFLD by ultrasonography among T2DM patients was 81%. 80% of these patients had mild NAFLD and 20% had moderate NAFLD; but none had severe NAFLD. The average HbA1c level of 8.9% had a mild NAFLD compared to patients with moderate NAFLD with an average HbA1c level of 10.1%. With a p=0.053, NAFLD severity and glycemic control do not show any statistically significant association. Subgroup analysis was not performed in the study due to limited sample size. In addition, results of association are not sufficient evidence for any conclusion; hence, there appear to be no group of interest.

Conclusion: The result of this study confirmed that the prevalence of NAFLD in T2DM was high at 81% but there is no sufficient evidence to conclude a statistically significant association between the level of glycemic control and the severity of NAFLD. **(Author's abstract)**

Keywords: *Type 2 Diabetes Mellitus, Non-Alcoholic Fatty Liver Disease, NAFLD, Glycemic control, HbA1c, Dyslipidemia, Obesity, Metabolic Syndrome, Medicine*

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0375

Primary Aldosteronism among Adult Filipinos with Resistant Hypertension: A Pilot Study

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Background: Primary aldosteronism (PA) was previously thought to be uncommon. With the utilization of plasma aldosterone concentration and plasma renin activity ratio (PAC/PRA) as a mode of screening, the frequency of its detection increased significantly. Among the population with an indication for PA screening, resistant hypertension has the highest prevalence. Detection of PA in this group is essential since it is associated with increased cardiovascular and cerebrovascular complications.

Objective: To determine the prevalence of PA among adult Filipinos at Capitol University Medical Center, Cagayan de Oro City, Misamis Oriental.

Methods: Adult Filipino patients with resistant hypertension underwent PA screening using the PAC/PRA. Patients with positive results were confirmed for PA either through IV saline infusion or using the following criteria: history of spontaneous hypokalemia or documented hypokalemia prior to screening, undetectable PRA (< 1 ng/ml/hour), and a PAC of > 15 ng/dl.

Results: Twenty-one patients were recruited, but only fourteen participated in the study. Thirty five percent of those who participated screened positive for PA. Among those who screened positive, three patients were confirmed of having PA.

Conclusion: The prevalence of PA in adult Filipinos with resistant hypertension in Capitol University Medical Center, Cagayan de Oro City, Misamis Oriental is estimated to be 21.43%. **(Author's abstract)**

Keywords: *Primary aldosteronism, Filipinos, Resistant hypertension, Medicine*

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0376

Prognostic Accuracy of qSOFA, NEWS, SIRS Criteria for In- Hospital Mortality Among Patients with Suspected Infection Presenting to the Emergency Department in a Tertiary Hospital in Cebu City: A Prospective Study

Pe, Maria Nadith L. , Olasiman, Chatie D. , Tan, Christ

Introduction: Sepsis has been redefined as a life-threatening organ dysfunction caused by a dysregulated host response to infection. The quick sepsis-related organ failure assessment (qSOFA) is a simple tool developed to prompt clinicians to consider patients at high risk for poor outcome. Studies have compared its utility with National Early Warning Score (NEWS) and the systemic inflammatory response syndrome (SIRS) criteria. These scoring systems may be utilized to prognosticate illness severity among patients with suspected infection and may be relevant in low- and middle-income settings where laboratory data are not readily available.

Objective: To determine and compare the accuracy of qSOFA, NEWS, and SIRS criteria in predicting in-hospital mortality in patients suspected to have infection presenting at the emergency department (ED)

Methods: This is a prospective cohort study. Patients ≥18 years old with suspected infection admitted to the ED between June 2018 to July 2018 were included in the study. SIRS, NEWS, and qSOFA scores were collected at presentation and patients were followed up until expired or discharged.

Results: A final population of 213 were included in the study with a mean age of 47 years (SD 21.2) and 124 (58.2%) females. The most common site of infection was respiratory (33.8%). Twelve patients (5.6%) died in-hospital. Among patients with qSOFA≥2, mortality rate was at 38% vs 3.5% for qSOFA<2. Specificity for mortality was highest for qSOFA (96%). Sensitivity was highest for SIRS (75%). SIRS, qSOFA, and NEWS had no significant difference in predicting in-hospital mortality with an area under the receiver operating curve of 0.659, 0.711, 0.711 respectively.

Conclusion: SIRS, qSOFA, and NEWS have similar prognostic accuracy to predict mortality but have limited use when applied individually which brings into question the sole utility of qSOFA despite its high specificity. It is reasonable to further validate or develop new scoring systems with higher predictive accuracy appropriate across different populations. **(Author's abstract)**

Keywords: *Sepsis, qSOFA, SIRS, NEWS, Medicine*

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0377

Progressive Interstitial Lung Disease in a Clinically Quiescent Dermatomyositis

Cruz-Bermudez, Charito , Urquiza, Sheen C. , Quinto, Milraam L. , Lomanta, Jan Michael Jesse C., Santiaguel, Joe

A 60-year-old Filipino woman diagnosed with dermatomyositis was initially on prednisone and methotrexate. She eventually developed interstitial lung disease (ILD) and so methotrexate was shifted to azathioprine; ho wever, azathioprine was discontinued due to cutaneous tuberculosis. Over eight years, the dermatomyositis was controlled by prednisone alone but the ILD worsened. This case demonstrated that the course of ILD may be independent of dermatomyositis. **(Author's abstract)**

Keywords: *Dermatomyositis, Interstitial lung disease, Immunomodulato, Medicine*

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0378

Promotion of Safe Motherhood in the Nursing Competency-Based Curriculum

Sana, Erlyn A. , Peralta, Arn

Purpose: Nurses play a significant role in maternal health. The nursing competency-based curriculum prepares students for this role. This study identified the competencies on safe motherhood expected of graduating nursing students, determined the degree of integration of these competencies in the curriculum, and described students' perceived levels of proficiency in performing said competencies.

Design: This is a descriptive cross-sectional study. The authors deduced concepts and principles of safe motherhood in nursing based on the 2006 standard competencies. A complete enumeration of 55 graduating students of a college of nursing in a state university in Manila participated in the study.

Methods: Students rated the competencies from A: “concepts were merely introduced” to D, “threaded through” in selected courses. The level of proficiency ranged from 1: “can perform well without supervision” to 4 “cannot perform despite supervision.” Ratings were analyzed using frequency counts, mode, and percentage distributions.

Findings: Seventy competencies on safe motherhood were derived. Cognitive and affective competencies on the basic nursing processes were threaded through in foundation, intervention, and intensive nursing process courses. Students could perform the cognitive and affective competencies without supervision but required assistance in performance of skills.

Conclusion: The nursing curriculum prepares students to promote safe motherhood; however, students need to improve their clinical skills to be fully competent. **(Author's abstract)**

Keywords: *Safe motherhood, Nursing educatio, Competency-based curriculums, Medicine*

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0379

Provision of Risk Welfare for Nurse Educators: A Policy Brief

Del Rosario, Maria Karmela C. , Lorica, Mari Elaine P., Abiva, Zhiela Marie

Nurse educators are vital in the future of healthcare and deserve recognition and benefits for this role they play. Nurse educators who are exposed to clinical and community settings are facing challenges different from those in the classroom setting. They are evidently at risk of exposure to numerous hazards, perils of life, and physical

hardships when they do preceptorship to students. In accordance with the Commission on Higher Education (CHED) Memorandum Order (CMO) 15, a nurse educator must supervise a maximum of 10 students in clinical and community settings to complete the corresponding number of Related Learning Experience (RLE) contact hours equivalent to 1836 hours in every student.

It is crucial that reforms and regulations be made to recompense nurse educators. Risk welfare is a financial benefit for nurse educators performing preceptorship in intensive nursing practice or RLEs. It is a payment to cover actual or potential threats or dangers associated with carrying out RLE activities. Proposed rates for the benefit may depend on the area and number of days of actual exposure; however, hospital settings may be considered at greater risk, warranting higher payment. **(Author's abstract)**

Keywords: *Nurse Residency Program, Novice nurse, Training, Filipino nurses, Medicine*

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0380

A Qualitative Approach to Understanding the Need for Better Pay: Perspectives of Albayano Nurses Employed in Private Hospitals

Gogola, Den

Purpose: Scholarly works have reported about the nurses' salary and its impact on job satisfaction, nurse turnover, retention, work condition, and provision of nursing care. However, studies are either focused on the nurses in government hospitals or nurses working outside the country. Thus, the study aims to explore and describe the lived experience of nurses employed in private hospitals in Albay province, the Philippines, and explicate the need for better pay.

Design: The study used a qualitative design, specifically a descriptive phenomenology approach.

Methods: Purposive sampling and in-depth interviews were conducted among seventeen (17) nurse informants. The audio-recorded interviews were transcribed verbatim and analyzed following the seven-stage process as described by Colaizzi (1978) for data coding and identifying themes. The same process of analysis performed among the responses or data gathered through electronic communication platforms.

Findings: Four themes and nine sub-themes were identified. The first theme is 'Over but under,' which includes three sub-themes: (1) Over-worked, underpaid working conditions, (2) Finding an additional source of income as a result of low-wages, (3) More nurses are produced, but less are staying in the country, (4) Required by law in the country but not permitted by low salary. The second theme is 'Same but different,' which includes three sub-themes: (1) The Nursing profession is akin to others, yet uncompensated, (2) Work demands are comparable to government hospitals. The third theme is 'Caring but uncared-for,' which includes two sub-themes: (1) Psychologically upsetting, (2) Stimulates nurses transition. The fourth theme is 'Selfless foresight,' which include only one sub-theme (1) Increasing the salary attracts nurses to stay in the country.

Conclusions and recommendations: The study results showed that nurses in private hospitals need better remuneration as they experience poor work conditions. Also, it described a low salary that impacts the nurses' workload, their physical and mental health, their socio-economic being, their ability to avail professional development, the retention or turnover, and the provision of nursing care. The study findings suggest data triangulation of the study in some other private hospitals outside the region and explore strategies for increasing nurses' retention and satisfaction. Nonetheless, these efforts will robust the empirical data about the need for better pay among nurses in the private sector. **(Author's abstract)**

Keywords: *Salary, Better Pay, Nurses in Private Hospitals, Retention, Turnover, Job Satisfaction, Medicine*

, Volume No. 90 Issue No. 1, 18-26
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0381

Quality of Life of Patients with Diabetic Foot Ulcer on Recovering

Widiyanto, Puguh , Handayani, Estrin, Kep

Diabetic ulcer is a dangerous complication of diabetes mellitus associated with adverse consequences and high costs. Diabetic ulcers have a significant impact on quality of life. It is related to activity restriction, disabilities and the loss of mobility. Diabetic foot ulcers also lead to body image impairment and limitation of interaction with others. The purpose of this study was to identify the quality of life of patients with diabetic foot ulcer. This study used a descriptive method among 35 patients who had foot diabetic ulcer graded 2, 3, and 4. Findings of the study revealed that diabetic ulcer affects physical health, psychological health, social relationship and environment of 54.3%, 54.3%, 85.7% and 60%, respectively. Therefore, it is suggested that healthcare providers, their families, and the community give motivation, support, and education on patients with diabetic foot ulcer to achieve higher levels of quality of life. **(Author's abstract)**

Keywords: *Quality of life, Diabetic foot ulcer, Medicine*

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0382

A RAPID REVIEW OF NURSES' EXPERIENCES WORKING IN HOSPITAL SETTINGS DURING THE COVID-19 PANDEMIC

Garma, Paul Froilan U. , Gilo, Ericka Louise C., Delgado, NiÃ±o Valentin

Background: Being at the frontline, nurses working in hospital settings are vulnerable to a range of experiences that impact their well- being. Measures to protect their health and welfare during the COVID-19 pandemic have been the focus of discussion among policy- makers and administrators. There is a need to collectively understand their personal experiences to inform relevant policy decisions.

Objective: To synthesize and present the best available evidence describing the experiences of nurses working in hospital settings during the COVID-19 pandemic.

Design: This is a rapid review using Tricco's seven stage process.

Data sources: Astructured search using PubMed, CINAHL, Scopus, and a local database Herdin was conducted.

Review Methods: A rapid review of studies published from January to August 2020, describing nurses' experiences of working in hospital facilities during the COVID-19 pandemic were included regardless of methodology. Following data screening and extraction, a narrative synthesis of the findings was conducted. nurse experiences, COVID-19, pandemic, rapid review

Results: Nineteen articles were included in the review. The experiences of nurses described in these articles generated a total of fifteen categories, based on similarities of meaning. Four synthesized findings were identified from the categories: (a) supportive nursing culture; (b) physical, emotional, and psychological impact of frontline

work; (c) organizational responsiveness; (d) and maintaining standards of care.

Conclusions: Nurses' experiences working in hospital settings during the COVID-19 pandemic are diverse, profound, and dependent on the context of practice and prevailing healthcare system and organization. These experiences reflect personal encounters and shifts in healthcare delivery that ensure protection and safety while maintaining standards of care. Robust studies are needed to capture and explore the breadth of these experiences and heighten the discussions that advocate for nurses' welfare and safety during pandemics. **(Author's abstract)**

Keywords: *Nurse experiences, COVID-19, Pandemic, Rapid review, Medicine*

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0383

A Rare Case of Human Dioctophyma renale infection in an Adult Filipino Male

Guerrero, Edison , Baluyut, Johanne S. , Villareal,

Introduction: *Dioctophyma renale*, also known as the “giant kidney” worm is the largest nematode that infects mammals. Most commonly, it infects dogs and only a few cases of human infestation have been reported.

Case Presentation: In this case, we present a 71-year-old male with a history of right flank pain, painless hematuria, obstructive urinary symptoms and occasional passage of a long red meat-like structure via urethra. Previous ultrasonography revealed a renal mass that was interpreted as renal malignancy. Patient was advised radical nephrectomy with biopsy; however, he was lost to follow up. After 8 years, he again presented with a 2-month history of right flank pain, gross hematuria, unintentional weight loss and obstructive urinary symptoms. He was admitted to our institution and laboratory findings revealed microcytic hypochromic anemia. Ultrasound showed a focal bulge in the superior wall of the urinary bladder and an enlarged right kidney with a large heterogeneous solid structure. Insertion of a foley catheter relieved the urinary obstruction and there was noted passage of a single roundworm measuring 55 cm by 0.32 cm. The specimen was sent for histopathology and microscopic examination revealed a necrotic body of a roundworm consistent with *Dioctophyma renale*.

Case Discussion: The clinical manifestations of *D. renale* infection are non-specific and the diagnosis can be a challenge as it commonly mimics renal malignancy and other intra-abdominal tumors. The diagnosis is often an incidental finding of the parasite on necropsy or by finding ova in the urine. The clinical findings of painless hematuria, unintentional weight loss and an ultrasound finding of renal mass usually point toward the diagnosis of renal cell carcinoma.

As we present this case, it will be highlighted that such signs and symptoms, such as painless hematuria, unintentional weight loss and ultrasound finding of a renal mass, can also be found in patients with rare human parasitism from *Dioctophyma renale*. **(Author's abstract)**

Keywords: *Medicine, Parasite, Nematode, Dioctophyma, Renal mass, Giant, Worm, Carcinoma, Kidney*

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0384

Reflexivity and Research Methodology: A Second Glance

Palaganas, Erlinda C., Estacio, Joel

As qualitative researchers, we are actively involved in the research process. We accept the fact that we are the main instrument, thus are part of the social world we aim to understand. It entails self-awareness and as Parahoo (2006) posits, reflexivity, as a process, is an introspection on the role of subjectivity in the research that entails a continuous process of reflection by researchers on their values. It is also a process of recognizing, examining, and understanding how their "social background, location, and assumptions affect their research practice" Hesse-Biber, 2007, p.17). Reflexivity, as the abundant literature would indicate, is an elusive term, it is commonly used interchangeably with reflectivity, and even with critical reflection. In this paper, an attempt was made to rediscover how reflexivity has been utilized in various perspectives to define its position and role in the conduct of robust qualitative research. In the process, we would like to share and solicit perspectives on reflexivity as a process and as an output. This was done thru a review of literature and the integration and highlighting of reflexivity/reflexivities of various researchers arising from the various research that we have been involved with such as: the six-country multi-disciplinary team lead by the Ottawa University based in Canada that undertook participatory research across Asia, Africa, and the Pacific to learn how poverty can be defined and measured; the five-country multi-disciplinary team, led by the Australian National University, Australia; and various local interdisciplinary researches. These researches were conducted over three years or more, some in various stages using focused group interviews, key informant interviews, observations, ladder ranking using photographs, record reviews, surveys, and photovoice. We also included documented reflexivities of colleagues with whom we have worked with in various capacities. We analyzed these documents vis-à-vis the concern of the qualitative researcher to unravel how their personhood intersects with their experiences in the field. Indeed, revisiting reflexivity and research methods enlightens the rigor in traversing the pathways of knowledge generation in qualitative research. **(Author's abstract)**

Keywords: *Reflexivity, Approaches to Reflexivity, Research Methodology, Reflexive lens, Credibility and Positionality, Ethics, Trustworthiness and Rigor, Medicine*

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0385

Reintegration: A Concept Analysis

TubaÃ±a, Rock B

Reintegration is an integral part of nursing care. Nurses play a critical role in contributing support, dependence, and continuity of care from rehabilitation to reintegration. While the reintegration of patients is a concept often used in nursing, its theoretical origin has remained unclear. This article aimed to conduct a concept analysis of reintegration for the development of nursing as a discipline and improve nursing care and health outcomes. The evolutionary strategy to concept analysis of Roger was utilized, which resulted in the characteristics of reintegration as to its attributes, antecedents, consequences, and exemplar in nursing practice in the context of COVID-19. The capacity to adapt, reorganize, offer support, and build a network of resources are attributed to the concept of reintegration. Antecedents include rehabilitation, survivorship from illnesses, trauma, and injuries, and disruption of social and physical functional performances and activities. The identified consequences include transition to recovery, quality of life, independence, successful adaptation, job satisfaction, holistic care, and continuity of care. The new conceptual definition of reintegration emerged. Reintegration is a process of nursing care among patients who demand assistance and support before transitioning to regain normality or on their way to being restored to the community in the presence of adaptation from health adversities. The patient in all areas is cared for holistically, offering support to meet his needs and overcome challenges in terms of physical, mental, social, and emotional aspects. Concept analysis is as essential as operationalizing a concept in the nursing discipline. **(Author's abstract)**

Keywords: *Reintegration, Quality nursing care, COVID-19, Medicine*

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0386

The Relationship between COVID-19 Anxiety and Student Nurses' Perceived Health, Sleep Quality, and Psychological Well-being

De los Santos, Janet Alexis A. , Labrague, Leodoro J. , Falguera, Char

Objectives. To determine the level of COVID-19 anxiety among Filipino nursing students and its predictors, and its associations with their perceived health, sleep quality, and psychological wellbeing

Methods. The study employed a cross-sectional design that administered a survey among selected nursing students in the Central Philippines through purposive sampling. We used self-report questionnaires, such as the COVID-19 Anxiety Scale, the Perceived Stress Scale, and the Psychological Well-Being Scale, and one-item measures for perceived health and quality of sleep.

Results. Out of 261 participants, more than half reported dysfunctional anxiety symptoms. Multiple regr ession analyses revealed that being of male sex and in the fourth-year level in the Nursing program was associated with lower COVID-19 anxiety. Further, nursing students who rated high in perceived health, sleep quality, and psychological wellbeing were more likely to report lower COVID-19 anxiety levels.

Conclusion. Nursing students' levels of COVID-19 anxiety indicate that the COVID-19 pandemic has psychologically affected this vulnerable group. COVID-19 anxiety can lead to poor sleep quality and psychological wellbeing. Nursing education authorities must formulate measures and strategies to protect the psychological welfare of nur sing students against COVID-19. **(Author's abstract)**

Keywords: *Nursing students, COVID-19, Anxiety, Sleep quality, Psychological wellbeing, Stress, Medicine*

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0387

Relationship of Work Engagement with Nurse Work and Patient Outcomes among Nurses in Central Philippines

De los Santos, Janet Alexis A. , Labrague, Leodoro J. , Firmo, Carmen N. , Falguera, Charlie C., Tsaras, Konstant

Objective. This study determined the association between work engagement among hospital nurses and their work outcomes (i.e., job satisfaction, stress, burnout, and turnover intention) and patient outcomes (i.e., missed nursing care, adverse events, and quality of care).

Methods. A cross-sectional study was employed using secondary data derived from 549 registered nurses working in different hospitals in Central Philippines. Eight self-report questionnaires were adopted to gather data in this study. Multiple linear and logistic regression analyses were used to test the hypotheses.

Results. Nurses with lower levels of work engagement reported increased levels of job burnout and turnover intention. Those nurses with higher scores on the dedication subscale reported increased job satisfaction and perceived quality of patient care.

Conclusion. Work engagement influences nurse work and patient outcomes in the Philippines. Higher levels of work engagement prevent nursing staff from leaving their workplaces and may help them find their work fulfilling personally and professionally. Nursing management should highly consider promoting work engagement through enhancing job resources to meet the needs of nurses and, eventually, improve professional work outcomes and quality patient care. **(Author's abstract)**

Keywords: *Burnout, Job satisfaction, Nurses, Nursing, Nursing care, Patient care, Philippines, Work engagement, Medicine*

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0388

A Retrospective Cohort Study on the Disease-Free Survival and Overall Survival of Patients with Stage I-III Triple-Negative Breast Cancer given Adjuvant Chemotherapy in the Makati Medical Center

Edusma-Dy, Regina T. , Tamayo, Maria Belen E. , Tan, Harold Nathan C., Lopez, Francisco Vicent

Background. Triple-negative breast cancer (TNBC) comprises 15-20% of all breast cancers and is marked by early relapse and poor overall survival. Adjuvant chemotherapy has become the standard of care for these patients albeit to this time there is no consensus on its optimal chemotherapy regimen. This study determined the disease-free-survival (DFS) and overall survival (OS) of patients with stage I-III triple-negative breast cancer given adjuvant chemotherapy in Makati Medical Center from 2000 to 2015.

Methods. A single institution (Makati Medical Center), retrospective cohort was conducted involving 157 stage I-III triple-negative breast cancer patients, diagnosed from January 2000 to June 2015, who completed an adjuvant chemotherapy regimen and had at least 3 years of follow up with their medical oncologist. Review of charts of these patients was done, and the demographic, clinical, histopathologic, chemotherapy, recurrence and mortality data were collected and analyzed. The OS and DFS rates were estimated using the Kaplan-Meier method.

Results. 107 stage I-III triple-negative breast cancer patients who met eligibility criteria were included in the analysis. The most common chemotherapy regimens were sequential anthracycline-taxane (32 patients, 29.09%) and anthracycline-based regimens (32 patients, 29.09%). The 5-year median OS of TNBC patients given adjuvant chemotherapy was 78.94% (95% CI: 69% to 86%) while the 5-year median DFS of TNBC patients was 71.71% (95% CI: 61.68% – 79.5%). There was no significant association between overall survival or disease-free survival and treatment with a particular chemotherapy regimen.

Conclusions. Adjuvant chemotherapy with sequential anthracycline-taxane, concurrent anthracycline-taxane, CMF, anthracycline-based and taxane-based regimens among stage I-III triple-negative breast cancer patients in Makati Medical Center resulted in comparable overall survival and disease-free survival. The use of immune checkpoint inhibitors presents a viable option in TNBC as demonstrated in the Impassion 130 and KEYNOTE 119 trials, and should be further evaluated in the Philippine setting. **(Author's abstract)**

Keywords: *Triple-negative breast cancer, Adjuvant chemotherapy, Overall survival, Disease free survival, Medicine*

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0389

A Retrospective Cohort Study on the Treatment Outcome after Unilateral Adrenalectomy among Patients with Aldosterone-Producing Adenoma at the University of Santo Tomas Hospital

Matawaran, Bien J. , Antonio, Kar

Background: Unilateral adrenalectomy is indicated for patients with unilateral primary aldosteronism resulting in normalization of hypokalemia and resolution of hypertension. This study aims to determine the proportion of patients with cure of hypertension and improvement of hypokalemia after unilateral adrenalectomy among patients with aldosterone-producing adenoma and assess the association of preoperative factors with these outcomes.

Methods: This is a retrospective cohort study among patients with aldosterone-producing adenoma who underwent unilateral adrenalectomy with at least one month follow-up after the operation. Patients were selected from admissions to the University of Santo Tomas Hospital from January 2008 to November 2018. The proportion of patients with cure of hypertension and resolution of hypokalemia were determined. Binary logistic regression was used to determine preoperative factors associated with these outcomes.

Results: Twenty-one patients were included in this study. Cure of hypertension was noted in 47.62% and 42.86% of patients within 24 hours of adrenalectomy and on follow-up, respectively. Improvement of hypokalemia was noted in 61.90% of patients within 24 hours of operation while all patients had improvement of hypokalemia on follow-up. Patients without preoperative hypokalemia were more likely to have cure of hypertension within 24 hours of adrenalectomy (OR=0.0250, p=0.005) and on follow-up (OR=0.0571, p=0.010).

Conclusion: Unilateral adrenalectomy results in improvement of hypertension and hypokalemia in the majority of patients with aldosterone-producing adenoma. Shorter duration of hypertension and absence of preoperative hypokalemia were significantly associated with cure of hypertension after unilateral adrenalectomy. **(Author's abstract)**

Keywords: *Hyperaldosteronism, Aldosterone-producing adenoma, Adrenalectomy, Medicine*

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0390

The Role of First Trimester HbA1c as a Predictor of Gestational Diabetes Mellitus and Adverse Maternal and Perinatal Outcomes among Non-Diabetic Pregnant Filipino Women

Soria, Arriza Kryssan M., Tan, Ceryl Cindy

Objectives: This study aims to determine the role of HbA1c level during first trimester in predicting gestational diabetes mellitus in Filipino non-diabetic women. Hence, to identify those will be at increased risk of its adverse maternal and perinatal outcomes, and who will benefit from early intervention. This will aid in preventing maternal and perinatal morbidity and mortality and reducing health care cost by avoiding strategies which can result in false positive cases.

Methodology: A cross-sectional study conducted in a tertiary hospital in the Philippines. Seventy-one Filipino pregnant women were included in the final analysis. HbA1c levels were taken during the first trimester and routine screening of gestational diabetes mellitus (GDM) utilizing 75 grams OGTT during 24^{th}-28^{th} weeks age of gestation. Binary logistic regression modeling was performed to determine if HbA1c was a predictor of gestational diabetes mellitus. The calculated median for Hba1c was then utilized as a threshold value to predict GDM. Odds ratio, relative risk and corresponding 95% confidence intervals from binary logistic regression were computed to determine the association of variables.

Results: In this study the prevalence rate of GDM is 38%. It showed that first-trimester HbA1c level is not a predictor of GDM and adverse maternal and perinatal outcomes. However, in utilizing an HbA1c threshold of ≥ 5.2%, there is a two-fold increase risk of developing hypertensive disorders, requiring insulin during pregnancy, and macrosomic newborns and a four-fold increase risk of having large for gestational age newborns. It has a positive predictive value (PPV) of only 16%. However, it has a high negative predictive value (NPV) of 88% therefore it can be used to rule out risk of GDM as early as in the first trimester.

Conclusion: The association of HbA1c level and the occurrence of GDM was not observed in this study. However, by using an HbA1c threshold of ≥ 5.2%, as opposed to the standard reference range for diagnosing type 2 diabetes mellitus and gestational diabetes mellitus in Caucasians, the relative risk of developing GDM in 24th-28th weeks AOG is 1.26 (0.6865, 2.3242). **(Author's abstract)**

Keywords: *HbA1c, Gestational diabetes mellitus, Pregnancy, Insulin, Medicine*

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0391

Role of the nurse in newborn screening: Integrating Genetics in 16 Nursing Education and Practice

Sibulo, Ma. Salve K. , Abad, Peter James B. , Sur, Aster Ly

Nurses are key players in the newborn screening (NBS) program. The inherited nature of the conditions included in the NBS panel means that nurses should be competent in integrating genetics in their practice. However, studies suggest inadequate preparation of nurses in incorporating genetics in their practice. This article aims to discuss how nurses can capitalize on existing population-based genetics programs such as newborn screening to enhance their clinical practice through genetics. An overview of the newborn screening program in the Philippines is provided as well as a discussion on the roles of nurses in genetics in the context of NBS, and a brief discussion of future directions of the Philippine newborn screening program and how this may impact nursing education and research. **(Author's abstract)**

Keywords: *Medicine, Newborn screening, Neonatal screening, Nurses, Genetics, Genomics, Nursing practice, Nursing education*

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0392

Scoping Review of Factors Affecting Philippine Nurse Licensure Examination Outcomes

Oducado, Ryan Michael F. , Montegrico,

Aim: This scoping review synthesized the existing literature on factors affecting Philippine nurse licensure examination (PNLE) outcomes.

Background: Studies about the nurse licensure examination in the Philippines had gained popularity in recent years. Various studies reported different factors affecting PNLE outcomes, since licensure examination is an interplay between individual, academic, institutional, and environmental factors. This review is the first study that synthesized the literature on factors affecting PNLE outcomes.

Methods: A scoping review of research articles published from 2000 to 2020 described the existing literature explaining the various factors affecting PNLE outcomes. The Preferred Reporting for Integrative Studies and Meta-Analysis for Scoping Reviews (PRISMA-ScR) was used to guide the study. Using the set inclusion criteria, 4,208 articles and gray literature were eligible for initial screening. A total of 29 studies were included in this review.

Findings: Majority of the PNLE studies were quantitative research, used correlation research designs, and were published between 2011 to 2020. The average PNLE first-time pass rate from 2014 to 2018 was 75 percent and overall passing rate improved from 39.2% in 2010 to 45% in 2016. First-time examinees and those who take the PNLE in November have increased odds of passing the examination. Wide variability in PNLE results were observed in the May/June PNLE. Intellectual ability, learning styles, and psychosocial behaviors impact individual PNLE outcomes. Academic performance in high school and nursing school, college admission test, nursing aptitude test, achievement exams, pre-board examinations, clinical nursing courses, English courses, and Microbiology and Parasitology are significant academic predictors of PNLE success. Institutional variables such as school size, type of school ownership, year of establishment, accreditation status, and faculty-student ratio are associated with PNLE outcomes.

Conclusion: Various individual, academic, and institutional factors influence PNLE outcomes. Identifying these factors is crucial in understanding the multidimensionality of variables that may impact PNLE performance. An insight into these factors may assist individual nursing students and graduates, as well as nursing schools, in developing strategies to increase their likelihood of passing and increasing the first-time pass rates in the PNLE. **(Author's abstract)**

Keywords: *Nurse licensure examination, Nursing education, Philippines, Medicine*

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0393

Seasoned Nurse Administrators Saga: In the Changing and Challenging Times

Palaganas, Erlinda C. , Narreto-Painagan, Theresa Li

This research endeavored to explore, describe and document the saga of experienced nurse administrators to come up with reflective learning in nursing leadership and management. A qualitative phenomenological approach was utilized, specifically descriptive and interpretative methods of Husserl and Heidegger.

Purposive sampling and referral were employed to select eight participants from the three fields of nursing administration (academe, hospital, and community) within Luzon, Philippines. An in-depth interview about the participants' experiences in nursing and nursing administration, together with a review of historical narratives and personal accounts were engaged to generate data. The interviews were transcribed verbatim and were analyzed following hermeneutic interpretive phenomenology.

An integrated analysis of literature showed parallel descriptions of participants' responses and the context of historical accounts and events in nursing in the Philippines. Four main themes have emerged in the saga of Seasoned Nurse Administrators (SNAs): 1) Nurse administrators' responses according to the need and context of nursing in their times; 2) Nursing foundations and training are geared towards the values of nursing as a service profession, 3) The pathways towards becoming a nurse administrator are marked with competence in the roles undertaken and living the passion for service; 4) SNAs facing challenges are towards the improvement of life conditions, excellence in their profession, and setting advocacies to elevate the nursing profession in the country in the 21st century.

Aconceptual model was formulated in understanding the paths towards a seasoned nurse administrator. **(Author's abstract)**

Keywords: *Nurse Administrators, Nursing Saga, Changes in nursing, Challenge in nursing, Reflective Learning, Interpretive Phenomenology, Nursing Management, Medicine*

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0394

SELF-COMPASSION IN NURSING: AN EVOLUTIONARY CONCEPT ANALYSIS

Remon, Ald

COVID-19 pandemic gives a new meaning to self-compassion thinking. Nurses in various fields or settings (e.g., hospital, CoViD- 19 isolation facility, community) provide care to patients and families who may be suffering and traumatized from the ongoing disease outbreak. Thus, it is necessary to illuminate the concept of self-compassion to respond to the holistic needs of the nurses who are at risk of developing compassion fatigue and burnout. This paper aims to examine the concept of self-compassion as it relates to nursing using simplified Rodgers' (2010) evolutionary concept analysis. Rodger's evolutionary concept analysis is an inductive method of analysis wherein concepts are viewed to develop over time and are highly influenced by the context in which they are used. The data source was a search of literature published from 2010-2020 on CINAHL, Google Scholar, and Health Source: Nursing/Academic Edition. The sifting process is utilized to ensure a comprehensive electronic database search.

This evolutionary concept analysis found four attributes of self-compassion in nursing: mindful attention, self-mastery, self- kindness, and shared humanity. Regarding the antecedents of self-compassion, it is necessary to experience suffering, an event, or a traumatic encounter. Consequently, these may result in compassionate care, positive well-being, and quality nursing care. In the nursing context, compassion toward self has been seen to subtle. During the continually evolving Covid-19 pandemic, nurses must be empowered to continuously envisage self-compassion in their daily practice. Frequent practice of compassion towards self can potentially appreciate this way of being in the nursing discipline and the patients, families, or communities for which nurses compassionately care for and serve. **(Author's abstract)**

Keywords: *Self-compassion, Nursing, Evolutionary Concept Analysis, COVID-19 Pandemic, Medicine*

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0395

Sex Differences in Cardiovascular Risk Factors and Management in a Preventive Cardiology Clinic at a Tertiary Referral Center

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Background: Cardiovascular disease is the leading cause of death in both genders worldwide. Gender differences in clinical presentation and treatment have been reported.

Objective: This study aims to describe and compare the cardiovascular risk factors and management strategies for primary prevention among Filipinos.

Methods: An analytical cross-sectional study was done on 2,082 patients at the Preventive Cardiology Clinic of a tertiary referral center in Quezon City, Philippines from January 1, 2002 to December 31, 2017.

Results: Seventy-two percent of the patients were females with a higher mean age compared to males (57.67 + 10.50 vs 55.66 + 11.82, p 0.002). There were more women who were unemployed (75.2 vs 45.9, p<0.001). There was no significant difference in the prevalence of hypertension (68.6% vs 67.9%, p=0.542) and type 2 diabetes mellitus (19.8% vs 21.5%, p=0.437) in both genders. Beta blockers (24.1%), calcium channel blockers (22.9%) and angiotensin receptor blockers (22.1%) were the most commonly prescribed anti-hypertensive drugs. Biguanides were the most commonly prescribed glucose-lowering drug (11.3%). Compared to men, more women had dyslipidemia (51.8% vs 38.6%, p<0.001). Statins were more commonly prescribed in women (22.4 vs 18.1%, p=0.033).

Conclusion: There were significantly more women seen in our Preventive Cardiology clinic. Smoking and alcoholic drinking were higher in males. BMI, total cholesterol and HDL were significantly higher in females than in males. **(Author's abstract)**

Keywords: *Sex differences, Cardiovascular risk factors, Cardiovascular disease prevention, Primary prevention, Preventive medicine, Medicine*

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0396

Sexual Health Intervention for Couples with Difficulty in Sexual Abstinence

Alberto, Da

Purpose: Nurses in the forefront of reproductive health services face the challenge of motivating clients to adapt fertility awareness-based methods, or making them continue with the method due to concerns about handling sexual abstinence. To assist nurses and other reproductive health providers, a sexual health intervention was developed. Thus, this study aimed to determine the effectiveness of the sexual health intervention called Kalabit-kalabit (sexual desire), Irap (abstinence), and Sanggang-dikit (shared behavioral plan) (KIS) on the sexual scripts, motivation, and behavior of couples with difficulty in sexual abstinence in natural family planning. Specifically, it aimed to identify the sexual scripts on pagkatao (personhood), pagkalalaki (manhood), pagiging lalaki (masculinity), pagkababae (womanhood), pagiging babae (femininity), pagtatalik (sexual intercourse), and pagpipigil (abstinence), as well as the sexual motivation and behavior of couples with difficulty in abstinence before and after KIS.

Methods: Embedded multiple-case study with purposive sampling using the replication logic was used to satisfy the inquiry. Four couples qualified using the assumption that difficulty with abstinence is caused by illogical sexual scripts, and inappropriate sexual motivation and behavior of either one or both spouses as a template to determine KIS's effectiveness. Pattern matching, cross- case synthesis, and logic model were used for analytic generalization. Prior to the conduct of the study, the research protocol underwent scrutiny by the Independent Ethics Committee of De La Salle Medical and Health Sciences Institute.

Result: KIS was found to be effective in (a) decoding and denouncing illogical sexual scripts and inappropriate sexual motivation and behavior, (b) reframing them to logical sexual scripts and appropriate sexual motivation and behavior, and (c) sharing mutual behavioral plans if accompanied with openness and full acceptance of self and spouse coupled with conviction, cooperation, commitment, and determination.

Conclusions: Decoding, challenging, reframing, and sharing mutual behavioral plans facilitate couples' competence in achieving sexual abstinence with ease. **(Author's abstract)**

Keywords: *Sexual scripts, Motivation, Behavior, Abstinence, Natural family planning, Medicine*

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0397

In Silico Screening of Schistosome Membrane Proteins as Candidate Diagnostic Antigens for Asian Schistosomiasis

Angeles, Jose Ma. M. , Ilao, Pocholo Miguel V. , Lim, Regeena Janine S. , Pineda, Patri

Asian schistosomiasis is primarily caused by *Schistosoma japonicum*. Given the relatively low prevalence of the disease, efforts are now focused on its elimination. However, the low sensitivity of the current diagnostic techniques underestimates the actual prevalence of schistosomiasis in areas with low endemicity. Therefore, this study aims to identify candidate diagnostic antigens that are potentially useful for the development of a reliable serological diagnosis of Asian schistosomiasis using the genomic databases of *S. haematobium* and *S. japonicum*. On the SchistoDB database, this study first employed a preliminary genomic filtration on 12,021 *S. haematobium* genes – including the presence of transmembrane domain, signal peptides, isoelectric point, and molecular weight yielding 113 genes. Further gene ontology (GO) enrichment analysis resulted in 22 candidate *S. haematobium* genes. These *S. haematobium* genes were then compared with the *S. japonicum* genome in the WormBase ParaSite, identifying 36 *S. japonicum* homologous proteins. The amino acid sequences of the 36 proteins were aligned using ClustalW to identify identical proteins, resulting in 21 distinct *S. japonicum* proteins considered as the final set of candidate diagnostic antigens. Therefore, these 21 candidate diagnostic antigens can be useful in developing a reliable serological diagnosis of Asian schistosomiasis, which may be accomplished through *in vitro* validation, protein characterization, and serological evaluation. **(Author's abstract)**

Keywords: *Schistosoma japonicum, S. haematobium, in vitro, In Silico, Medicine*

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0398

Spiritual Well-Being of Filipino Patients with Cancer

Tupaz, Alyssa Jenny E., Balabagno, Araceli

Cancer is a serious disease that leads to physical, psychosocial, and spiritual difficulties. Filipinos' high reverence to God can affect their health-related behaviors and responses to illnesses like cancer. Though studies have shown the association of spirituality and quality of life, very few have been conducted in Filipino cancer patients. This study aimed to describe their spiritual well-being in terms of the personal, communal, environmental, and

transcendental domains; and compare spiritual well-being across different patient characteristics (i.e. type of cancer, stage of cancer, type of treatment, and the period since first symptoms are felt) as input to determining patients at risk for spiritual distress. A descriptive cross-sectional design was utilized with 87 conveniently sampled respondents. A researcher-developed questionnaire and the Spiritual Health and Well-being Measure© (SHALOM) instrument were used to collect data. Data were analyzed using descriptive statistics and Kruskal Wallis H Test. Majority of the respondents were below 50 years old, female, married or with a common-law partner, had at least a high school education, unemployed, did not have enough income to support basic needs, Catholic, and an active member in the church. Most of them had colorectal cancer, were in Stage III, first felt symptoms 6 months to 1 year prior to the conduct of the study, and received a combination of treatments. In terms of personal state, the patients had the highest spiritual well-being in the Transcendental Domain which describes one's relationship with God. The second-highest spiritual well-being level was found to be the communal domain followed by personal, and environmental domains. Significant differences were found in the spiritual well-being scores in the 4 domains across the types of cancer, with the lowest scores among those with head and neck cancer. Filipino patients in the study had high spiritual well-being despite the presence of cancer. Patient characteristics, especially their illness profile, should be considered in developing nursing interventions that may improve their spiritual well-being. **(Author's abstract)**

Keywords: *Spiritual well-being, Cancer, Nursing, Filipinos, Medicine*

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0399

Spirituality and Spiritual Care in Nursing: A Literature Review

Basatan, Christian J. , Valenzuela, Judith P. , Galutira, Gemma D., Castro-Palaganas, Erl

Spirituality is a multifaceted concept with varied definitions. In the nursing literature, it is commonly described based on its significance in the lives of individuals. Exploring the perspectives of nurses, nursing students, and patients regarding spirituality and spiritual care is crucial to gain a sound understanding of how these concepts impact the nursing profession.

This literature review explored the perspectives on spirituality and spiritual care of four population groups: nurse educators, nursing students, clinical nurses, and patients. A literature search was done using worldwide databases. The 84 articles included dealt with the perceptions of nurse educators, nursing students, clinical nurses, and patients regarding spirituality and spiritual care.The four main categories of perspectives from the nurse educators, nursing students, nurse clinicians, and patients yielded ten sub- categories: (a) meaning of spirituality and spiritual care, (b) role of spirituality and spiritual care in nursing practice, (c) role of nursing education in developing spirituality and spiritual care competence of nursing students, (d) manner of integrating spirituality and spiritual care in nursing curriculum, (e) methods of teaching spirituality and spiritual care, (f) manner of spiritual care delivery, (g) barriers and challenges to the teaching and learning of spirituality and spiritual care, (h) barriers and challenges to spiritual care delivery, (i) ways of enhancing nurse educators' competence in curricular integration and teaching spirituality and spiritual care, and (j) ways of enhancing nurses' competence in spiritual care delivery.

Nurse educators, nursing students, clinical nurses, and patients presented similar and diverse perspectives, but they all recognized the significance of spirituality and spiritual care in the profession. The information derived from this study can contribute to the existing knowledge base and spur strategies at individual and institutional levels to enhance teaching and learning of the concepts, improve practice, and promote holistic care. (**Author's abstract)**

Keywords: *Nursing, Clinical nurses, Literature review, Nurse educators, Nursing students, Patients, Spiritual care, Spiritualityn, Medicine*

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0400

Stigmatization of Nurses: A Concept Analysis

Fagarang, Mark

For the past months, a new strand of Coronavirus, SARS-CoV-2 has been challenging our health care systems worldwide. Healthcare workers especially nurses are not just at risk of adverse physical symptoms but may suffer from psychological stress. This is one scenario of a stigmatized nurse.

The goal of primary care is to improve patients' health, longevity, and quality of life through the provision of patient-centered care. To do so healthcare providers must overcome any stressful activities or circumstances like stigma. This concept focused mainly on a stigmatized nurse. For this concept analysis, the framework of Walker and Avant was used. Definitions of terms are discussed. Cases were also identified for a better representation of the concept. Empirical referents and implications to nursing are also presented. **(Author's abstract)**

Keywords: *Nurse, Stigma, Concept analysis, Medicine*

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0401

Surgical Scrubbing With and Without a Brush in Decreasing the Number of Germ Colonies on Hands: A Systematic Review

Irwan, Andi Masyitha , Bambi, Adi Ang

Purpose: This study aims to compare surgical scrubbing with and without a brush in decreasing the number of germ colonies on hands.

Background: Surgical scrubbing with and without a brush are currently popular worldwide. To date, the optimal method in decreasing the number of germ colonies on the hands is not known.

Methods: Systematic review of effectiveness was conducted. The databases and publisher websites included PubMed, Science Direct, Google Scholar, Wiley Online Library, Cochrane Library and recruitment studies published between 2009-2019. The risk of bias was assessed utilizing Cochrane Collaboration's tool.

Results: Included clinical studies consisting of five randomized controlled trials. The procedures and duration of surgical scrubbing on each study varied depending on the protocol as a reference. All clinical studies found no difference in the number of colony-forming units (CFU) on the hand between surgical scrubbing with and without a brush.

Conclusions: Scrubbing with and without a brush showed similar efficacy in terms of the number of germ colonies on the hands. **(Author's abstract)**

Keywords: *Brush, Brushless, Germ colonies, Surgical scrub, Medicine*

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0402

A Systematic Literature Review of Nursing Interventions for Postpartum Depression and their Outcomes

Camagong, Kaye D. , Cabrera, Pauline Nickolle C. , PeÃ±alba, Adrian France Neil M., Pagatpatan, Jr., Cels

Purpose: This study was conducted to bring together studies on the common nursing interventions for postpartum depression (PPD) and their outcomes. It aims to provide interpretation of relevant findings to help further enhance the nursing care of patients with postpartum depression.

Design and Methods: A systematic literature review (SLR) approach was utilized to synthesize studies related to the management of postpartum depression and its outcomes. One hundred five studies (105) were initially retrieved from three online databases. Eventually, fifteen studies were included in this review after the screening process on quality and risk of bias assessments. Codes were identified from the included studies and were clustered into themes. A thematic map was formulated to visualize the interconnections of the nursing interventions for postpartum depression and its outcomes.

Findings: Nurses caring for patients with postpartum depression usually practice PPD education, perinatal assessment, PPD counseling, nurse-delivered psychotherapy, providing social support, drug administration, complementary and alternative therapy combined with conventional management, and patient referral. These nursing practices for postpartum depression yielded the following outcomes: (1) symptom alleviation, (2) empowerment, (3) positive feedback, and (4) negative outcomes.

Conclusions and Recommendations: There is a range of nursing interventions for postpartum depression. This review highlights the significant roles of PPD education and nursing assessment and emphasizes these interventions to be practiced not only after childbirth but also during the prenatal period to identify at-risk patients and provide early intervention. This review also emphasizes the need for more coordinated care and a multidisciplinary approach, including patient referral, to achieve better outcomes in the care of postpartum depression patients. This relates to the acknowledgment of the various factors contributing to the development of postpartum depression and its lack of clear etiology. **(Author's abstract)**

Keywords: *Postpartum depression, Postpartum depression intervention, Postpartum depression management, Postpartum depression outcome, Multidisciplinary approach, Medicine*

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0403

Telenursing: A Viable Nursing Response to the COVID-19 Pandemic

Macalintal, Leona Paula L. , Garma, Paul Froilan U. , Tabudlo, Jer

The COVID-19 pandemic has put the delivery of vital health and nursing services uniquely challenged. Restrictions in social mobility, fear of contraction, and risks of transmission posed by this pandemic prompted healthcare institutions to deliver health care services remotely using information and telecommunications technologies, also known as telehealth. Telenursing is one of the components of telehealth. Although there are

several strides in the use of nursing-related technologies in the country, telenursing is not a mainstream nursing service. Exploring telenursing and articulating the roles of nurses in this care delivery model is imperative given the current paradigm shift to telehealth and telemedicine in the healthcare system. This article provides a context for telenursing use in the local setting by providing factors affecting its implementation. A literature search was conducted to identify the benefits, challenges, requirements, competencies, activities, and outcomes of telenursing. Despite the limitations posed by this pandemic, telenursing offers a viable, cost-effective, and patient-centered approach in health services delivery. The implications in nursing practice, education, and research are explained. **(Author's abstract)**

Keywords: *Telenursing, Telehealth, COVID-19, Nursing care, Medicine*

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0404

From Testing to Coping: The Voices of People Living with HIV/AIDS

Cutamora, Jezyl C. , Milallos, Mark Gilb

This study aimed to explore the lived experiences of people living with HIV/AIDS in Cebu, Philippines. The study utilized Husserlian qualitative phenomenological design. Ethics clearance was acquired from Vicente Sotto Memorial Medical Center – Ethics Review Committee.

There were 7 informants that were recruited through purposive sampling and research referral techniques. The researchers used an open ended interview guide where interviews were audio recorded, transcribed and analyzed using Collaizi's method. Three (3) themes have emerged in this study. The first emerging theme is, (1) Why get tested? With the following subthemes of, (a) Presence of Risky Behavior; and (b) Knowledge that lead to testing. The second theme is, (2) Challenges after diagnosis with subthemes of, (a) Psychosocial challenges; and (b) Physical Challenges. Lastly, the third theme is, (3) Response and Coping with HIV/AIDS with the following subthemes, (a) Establishing old and new networks: Support systems; (b) Socio-spiritual changes: lifestyle changes and being more religious; and (c) Moving Forward.

High risk sexual patterns, knowing that a partner is HIV positive and the presence of some signs and symptoms are the factors considered for testing. PLWHA's compliant of their treatment regimen despite the undesirable side effects and opportunistic infections. Stigma results to non-disclosure of status and mental health issues are common. The presence of support groups is essential; PLWHA's are willing to adapt a healthy lifestyle; and they become advocates of the disease.

There is a need to increase the promotion of safe sex practices and health education about HIV/AIDS. Continuous support is needed in order to increase visibility of support groups, and the development of self-advocacy skills of PLWHA's. Mental health should also be given attention. **(Author's abstract)**

Keywords: *People Living with HIV/AIDS, PLWHA, HIV, AIDS, Lived Experiences, Medicine*

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NP

0405

Therapeutic Plasma Exchange as a Treatment for Central Pontine Myelinolysis in a 41-year-Old Male with Chronic Renal Insufficiency: A Case Report

Pasamonte, Donaryn Villa , Santos, Marie Joyce Urnos , Dela Cruz, Joice Bumanglag , Carabbacan, Catherine Matnao , Wong Lu-Reyes, Jane Wendolyn , Reyes, Aurelio Pantaleon S , Manalo, Guillermo III Lacuesta, Pascual, Sheryll Juan , Quilala, Deanna

Case **Summary**

Therapeutic plasma exchange (TPE) has been reported as a possible treatment for osmotic demyelination syndrome – central pontine myelinolysis (ODS-CPM), a degeneration of myelin within the central nervous system related to rapid hyponatremia correction, which though uncommon, has significant morbidity, and has no established specific treatment.

We present our experience with a 41-year-old male with chronic kidney disease, maintained on steroids, who presented with lethargy and behavioral changes. Initial metabolic panel showed severe hyponatremia (Na 109 mEq/L). Despite cautious sodium correction, the patient's sensorium decreased further and was intubated. Involuntary movements of the left face and arm were later seen. T2/FLAIR hyperintensities in the brainstem and thalami affirmed the diagnosis of ODS. A total of nine cycles (one cycle every two to three days) of TPE were completed. The patient was discharged with improved sensorium, from E2VxM4 to E4VxM6, and with no indication for hemodialysis due to improved creatinine. One year later, the patient has no remaining neurologic deficits.

Our experience supports other case reports that TPE is a viable therapy for ODS-CPM. **(Author's abstract)**

Keywords: *Therapeutic plasma exchange, Central pontine myelinolysis, Chronic renal insufficiency, Medicine*

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0406

Time to Blood Culture Positivity as a Predictor of Clinical Outcome among Septic Patients

Caoili, Janice C. , Escudero, Alrik Ea

Introduction: In the setting of Sepsis, Blood Culture is one of the important diagnostic tools in aiding a clinician to determine the offending pathogen. Following the Sepsis Bundle, Blood Culture is obtained at two sites before initiation of antibiotics. However, blood Cultures are one of the expensive tests wherein some clinicians find it unnecessary and costly. This study would provide more information regarding positive blood cultures among septic patients as a prognostic tool regarding the time to positivity. Reporting Time to Positivity would aid clinicians in the severity of the infection and could be used as a clinical predictor of mortality. This study investigated the optimal cutoff point of the time to positivity to predict mortality and the association between time to positivity of blood cultures with mortality among septic patients.

Methods: This was a single-center cross-sectional study with a retrospective chart review of septic patients with positive blood cultures. The optimal cutoff point of time to positivity was determined and associated with mortality.

Results: 405 adult in-patients with sepsis in Makati Medical Center from April 1, 2017, to April 30, 2018, were reviewed. The suggested optimal cutoff TTP is ≤19.1 hours, with sensitivity 79.78%, specificity 28.48%, accuracy 39.75%, Youden's index 8.26%. The overall mortality rate is 21.98%. The mortality rate was higher in the TTP < 19.1 group at 23.91% compared to the>19.1 hours group. Predictors associated with mortality are age, liver comorbidity, genitourinary source of infection, and short TTP.

Conclusion: A short TTP was associated with higher mortality rates. TTP can be clinically used to predict poorer

outcomes. Therefore, patients with a short TTP should be monitored more closely, and appropriate antibiotics should have been initiated. **(Author's abstract)**

Keywords: *Time to Positivity, Blood Culture, Mortality, Medicine*

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NP

0407

Total Phenolic and Flavonoid Content and *In Vitro* Antioxidant Activity of Selected Herbal Products Using Oxygen Radical Absorbance Capacity, Multi-radical (ORAC MR5) Assays

Pagcatipunan, Rodolfo S. , Matias, Ronald R. , Calanasan, Cleofe A. , dela Cruz, Frederick B. , Yao, Kathleen Beverly P. , Villaruz, Jay-ar I., Policarpio, Jonas D. , Vilela, Geral

Reactive oxygen and nitrogen species (ROS/RNS) are known to cause oxidative damage to cells and macromolecules. Intake of antioxidant-rich fruits and vegetables has been touted as a strategy to mitigate oxidative stress, but this is not always accommodated in modern diets. Augmentation with antioxidant-rich herbal supplements may be a preventive measure against the negative effects of ROS/RNS. In this study, we verify and compare the antioxidant claims of herbal supplements by measuring their phytochemical content and antioxidant capacities through the oxygen radical absorption capacity–multi-radical (ORAC MR5) assays. ORAC MR5 measures antioxidant activity against five biologically relevant ROS/RNS (peroxyl and hydroxyl radical, superoxide anion, singlet oxygen, and peroxynitrite). Four products were tested: two multi-herbal capsules (INT and Oxxy), a mangosteen fruit pulp powder capsule (MPC), and a mixed herbal drink (MHD). Phytochemical content was quantified through total phenolic and flavonoid content assays. Oxxy had the highest flavonoid content per serving (106.4 mg catechin eq/ 450 mg capsule) and ORAC MR5 value (37,503 μmol Trolox eq/ 450 mg capsule), followed by INT (53.5 mg catechin eq and 17,298 μmol Trolox eq/ 200 mg capsule), MPC (48.1 mg catechin eq and 7,675 μmol Trolox eq/ 500 mg capsule), and then MHD (7.4 mg catechin eq and 146.7 μmol Trolox eq/ 30 mL drink). Significant antioxidant activities against peroxyl radicals and singlet oxygen were observed for INT and Oxxy, whereas the antioxidant activity of MPC and MHD were mostly towards peroxyl radicals. A strong correlation was found between phenolic and flavonoid contents and ORAC MR5 values, and we confirmed supplier claims on standardized phenolic content or antioxidant activity of INT and Oxxy. This study demonstrated the utility of ORAC MR5 as a measure of in vitro antioxidant activity of herbal supplements against biologically relevant ROS/RNS and may be used for the development and quality control of herbal supplements. **(Author's abstract)**

Keywords: *Antioxidant, Herbal supplements, ORAC MR5, Reactive oxygen and nitrogen species (ROS/RNS), Total flavonoid content, Total phenolic content, Medicine*

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0408

Transition Experience to Professional Nurse: A Phenomenological Approach

Wardle, Lisa D. , Chung, Stephanie M. , Cummings, Jo-

Purpose: Transition programs have been adopted by many healthcare institutions to assist the new graduate nurse as they adjust to the work environment. The use of structured residency programs and prolonged orientations are considered best practices to ease the new graduate nurse into their role. This study aims to describe the lived experience of new graduate registered nurses as they enter the workforce.

Design: Using a qualitative research design, Van Manen's phenomenological inquiry, study participants were selected using non- probability purposive sampling. Data were collected between December 2018- September 2019 with in-depth interviews using semi-structured questionnaires. The sample (N=7) consisted of participants born between the years 1986-1996, graduated within three years of the study, and practice in the northeastern region of the United States.

Method: Amodified Colaizzi approach allowed the researchers to return to the study participants to validate themes.

Findings: The experience and perceptions of new graduate registered nurses are unified in two major themes discussed within this article: emotional ambivalence and the need to escape.

Conclusion: New graduate nurses continue to feel overwhelmed and need structured guidance during their professional transition training programs. In the absence of strong support by the institution, new graduates leave the bedside. **(Author's abstract)**

Keywords: *New graduate registered nurses, Transition shock, Phenomenology, Colaizzi Method, Organizational issues, Residency programs, Turnover, Medicine*

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NP

0409

Tripod Position as A Novel Adjunct Clinical Management of Moderate to Severe ARDS in COVID-19 Patients: A Case Series and Review

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Objective: The World Health Organization (WHO) recommends prone positioning for mechanically ventilated COVID-19 patients with Acute Respiratory Distress Syndrome (ARDS) to improve oxygenation. Subsequently, researchers facilitated the position to non-intubated COVID-19 patients as early management which showed significant improvement but with discerned limitations. Tripod position is explored as an alternative exhibiting promising results. This present study describes a case series of four patients with moderate to severe ARDS who demonstrated considerable breakthrough.

Methods: Four cases of moderate to severe ARDS were instructed to do tripod positioning as long as they can tolerate while under close supervision.

Results: An hour after assuming tripod position, all four patients presented a decrease in respiratory rate, increase in peripheral oxygen saturation, and increase in partial oxygen saturation in arterial blood gas. The assumed position was maintained by four patients without discomfort and was maintained with a mean of 12 - 20 hours per day.

Conclusions: Our findings confirmed that tripod position is advantageous to non-intubated patients with moderate to severe ARDS and may delay or prevent invasive mechanical ventilation. The position also manifested tolerance to extended duration which permitted time for the medical team to focus on managing their disease in its entirety. Nevertheless, certain aspects such as contraindication, side effects, and other adverse events that may occur have yet to be sufficiently clarified and investigated. **(Author's abstract)**

Keywords: *Tripod position, Prone position, Acute respiratory distress syndrome, Covid-19, Dyspnea-relieving position, Medicine*

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NP

0410

Tuberculous Laryngitis mimicking as Fungal Laryngitis: A Case Report

Ramos, Cassius Kay G., Robles, Jeremyjones

Tuberculous laryngitis was considered common during pre-antibiotic area but after the effective antitubercular medication, the incidence of laryngeal tuberculosis had decreased to less than one percent2. Clinical presentation is mostly unclear but usually presents with odynophagia, cough, hoarseness of voice and frequently confused with other diseases, more importantly fungal laryngitis.

This is a case of a diagnostic dilemma of an immunocompetent 55-year-old male presenting with odynophagia, dysphagia and hoarseness of voice that was initially managed as a case of fungal laryngitis due to history of prolonged use of dexamethasone and findings of leukoplakia in laryngoscopy. Despite adequate time for treatment, no significant improvement was noted. Acid fast bacilli microscopy tested negative. A previous history of pulmonary tuberculosis treatment and chest radiographs revealing fibrosis on both upper lungs puts tuberculous laryngitis as one of the differentials. Sputum GeneXpert/RIF taken and tested positive, hence lead to the diagnosis of tuberculous laryngitis. Guideline-based quadruple anti-tubercular therapy started and had showed a positive response.

Laryngeal tuberculosis (LTB) requires a high index of suspicion since it mimics various laryngeal diseases such as fungal laryngitis or malignancy. Clinicians should always be aware of the atypical clinical features of laryngeal tuberculosis and the possibility of primary laryngeal tuberculosis, for early diagnosis and prompt treatment, thus preventing morbid complications. A positive mycobacterial culture along with a typical histopathological appearance remain the cornerstone of diagnosis, but sputum AFB in microscopy and GeneXpert/RIF must not be ignored as these can be cost-effective diagnostic alternatives. **(Author's summary)**

Keywords: *Fungal laryngitis, Laryngeal tuberculosis, Gene X-pert/RIF, Medicine*

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0411

Understanding Experiences of Young Adult Males with Below-Knee Amputation

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Purpose: This study was done to explore the experiences of young adult males with below-knee amputation at surgical wards and clinics in Teaching Hospital, Kurunegala, Sri Lanka.

Design: The study used the phenomenology design of qualitative research.

Methods: Face-to-face interviews were conducted for data collection using a theme list with a saturation point

reached at16 participants. The duration of an interview was 30-45 minutes and was recorded on audiotape and transcribed later. Phases of familiarization with the data, coding, searching for themes, reviewing themes, defining and naming themes, and writing up were conducted accordingly to thematic analysis.

Findings: The young adult male below-knee amputees showed changes in lifestyle with dependence on others, supporting aids, and experiencing discomfort. They showed mental distress with dissatisfaction with life and suffering of life. Additionally, they lacked power with identity changes and encounter economic problems in their lives.

Conclusions and recommendations: It is essential to give special education to the staff caring for the below-knee amputees to minimize their unpleasant and challenging experiences. Health staff can motivate family members and friends for individuals' mental adjustment to their new life. Additionally, the social attitude of the community should be changed positively regarding amputated patients. **(Author's abstract)**

Keywords: *Knee amputation, Sri Lanka, Phenomenological study, Males, Medicine*

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NP

0412

Understanding Hope and Spiritual Well-being of Filipino Caregivers of Terminally-Ill Cancer Patients

Bonito, Sheila , Concepcion, Zena

This descriptive correlational study determined the level of hope and spiritual wellbeing among Filipino caregivers of terminally-ill cancer patients, and the relationship of hope and spiritual wellbeing to various patient and caregiver characteristics. The study involved 50 caregivers of terminally-ill-cancer patients, mostly belonging to 51-60 age group (42%) with mean age of 44 years (SD=15), mostly females (72%), married (62%), Roman Catholic (90%), high school graduates (50%), spouses of patients (28%), with an average of 18.36 hours of caregiving in a day for an average duration of 21.4 months. The hope and spirituality scores of caregivers were 3.24 (SD=0.28) and 3.25 (SD=0.46) respectively. Caregivers had high self-efficacy (3.29) but low social support (1.72). Patient's age was moderately correlated with caregiver's hope ($r=0.3$; $p=0.03$). Caregiver's educational attainment was significantly associated with hope ($p<0.01$) and spiritual wellbeing ($p<0.01$). Caregiver's self-efficacy was moderately correlated with their spiritual wellbeing ($r=0.46$, $p<0.01$). Caregiver's hopes were (1) for their patients to get well and recover from their illness, (2) to have strong spiritual faith and be healed with God's help (3) to be hopeful and positive, (4) hope for longer life, (5) resumption of family relations, and (6) free of pain and other discomforts. Caregivers' thoughts on spiritual wellbeing were to have: (1) stronger faith, (2) being prayerful, and (3) being positive. Compared to other studies, Filipino caregivers had lower hope scores, but higher spiritual wellbeing scores. Nursing interventions promoting hope and spiritual wellbeing should be conducted in patients' room, clinic appointments, or during home visits. Nursing care promoting hope and spiritual wellbeing should be part of patients' activities for daily living. **(Author's abstract)**

Keywords: *Cancer patients, Caregivers, Medicine*

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NP

0413

Understanding the Lived Experience of Filipino Mothers on Water Birth

Tabtab, Elija Shane P. , Soriano-Chicano, LeDenisse , Valencia-Raymundo, Agnes, Soleta, Nastashya Allan

Purpose: The study purported to explore the lived experience of a select group of Filipino mothers who had undergone water birth delivery.

Design: A qualitative, descriptive phenomenology research design was used to investigate the phenomenon. The sample (N=10) was comprised of women who had undergone water birth, 25-45 years old, primiparous and multiparous. A self-report method using face-to-face, in depth, semi structured interviews guided by an aide memoire abetted the data collection procedure.The principles of beneficence, respect for human dignity, and justice were observed throughout the research process.

Mode of Analysis: Significant statements were culled from the field text and analyzed using Colaizzi method. The validation techniques of members checking and critical friends were utilized.

Findings: The findings revealed that mothers found the experience extraordinary and the warmth and buoyancy of the water used in such mode foster comfort and ease of delivery while enabling them to manage their pains positively. Four themes emerged namely:
(1)In her own private world; (2). At her fullest power; (3)To her ease and comfort; and (4) At her own course

Conclusions: Research in recent times has provided limited evidence in making water birth a prevalent alternative for women to welcome their babies into this world. It is vital to focus on the experience of water birth from the mother's lens. Water birth has potential benefits to both mother and neonate and promotes maternal satisfaction; however, it remains the responsibility of health practitioners to provide credible evidence of its safety to prove that water birth is a valuable option to conventional delivery. **(Author's abstract)**

Keywords: *Water birth, Descriptive phenomenology, Colaizzi method, Medicine*

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NP

0414

Use of Convalescent Plasma Therapy among Hospitalized Coronavirus Disease 2019 (COVID-19) Patients: A Single- Center Experience

Torres, Rosalio P. , Ariola-Ramos, Mary Sheila , Mangahas, Claudette G. , Gatchalian, Ellen M. , Mesina, Flordel

BACKGROUND: COVID-19 disease has strained our healthcare system. Convalescent plasma is an adjunct treatment used in emerging infectious diseases in past epidemics.

OBJECTIVE: This study aims to determine the outcome and clinical course of COVID-19 patients who received convalescent plasma (CP) transfusion at Cardinal Santos Medical Center.

METHODS: This is a retrospective cohort analytical study of 75 patients who received convalescent plasma.

RESULTS: Median time from admission to CP transfusion was 3 days. Majority of patients received additional therapies including dexamethasone (100%), antibiotics (100%), remdesivir (95%), hemoperfusion (88%), tocilizumab (65%), or combinations of these. Among the survivors, the median length of stay (LOS) was 15 days while non-survivors had a median LOS of 6 days. One patient (1.33%) had a mild transfusion reaction. Four patients (5.33%) developed deep vein thrombosis despite anticoagulation. There was improvement in the inflammatory markers (LDH p value 0.04, CRP p value 0.00, Ferritin p value 0.0001). There was improvement in the pulmonary parameters - increase in mean PaO2, mean SaO2, and mean PFR; and decrease in mean FiO2

and mean RR post-treatment. Median LOS is 14 days for the CP group vs 11 days for the non- CP group. Mortality rate among the CP group was 25.33% while the non-CP group was 26.67%. LOS and mortality rate did not reach statistical significance.

CONCLUSIONS: There was no significant difference in mortality and length of hospital stay in patients given CP vs controls. CP when combined with other treatment modalities might have a role in the improvement of inflammatory markers and pulmonary status. **(Author's abstract)**

Keywords: *Convalescent plasma, Hospitalized COVID-19, Medicine*

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NP

0415

Validation of the Filipino Translation of the Impact of Vision Impairment for Children (IVI_C) Questionnaire among School Children

Monzonâ€“Pajarillo, Andrea Kristina , Santiago, Alvina Pauline D. , Sipin, Sofia Ceci

Background. Quality of life questionnaires provide valuable information in assessing the effects of health interventions and public health campaigns. In the Philippines, we only have a few validated questionnaires targeted specifically for children.

Objective. To translate to Filipino and validate the translated Impact of Vision Impairment for Children Questionnaire (IVI_C).

Methods. This is a translation and validation study of the IVI_C. The IVI_C was translated following international guidelines of forward–translation and back-translation methods. After completion of the Filipino IVI_C version, pretesting was performed on school-aged children 8 to 18 years old through convenience sampling in the outpatient department and Pediatric Ophthalmology and Motility Clinic at *Sentro Oftalmologico* Jose Rizal, Philippine General Hospital from January 1 to August 31, 2018.

Results. We included 130 participants in the study. The calculated Cronbach's alpha coefficient of 0.88 for the translated Filipino version of the IVI_C suggested high reliability and internal consistency. Rasch analysis showed comparability of the Filipino translation to the original English version of the questionnaire.

Conclusion. Our study showed that the Filipino version of IVI_C questionnaire was of high reliability and validity. **(Author's abstract)**

Keywords: *Quality of life questionnaire, Visually impaired children, Filipino children, Vision-specific questionnaire, Medicine*

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NP

0416

Validation of the Filipino Version of the Pittsburgh Sleep Quality Index (PSQI) in Perpetual Help Medical Center–Biñan and University of Perpetual Help Biñan

Espiritu-Picar, Rosalina B. , Bernabe, Kris A

Introduction: Sleep health is essential to overall physical, mental and neurobehavioral well-being. Poor sleep quality has been linked to numerous health conditions, impaired school and work performance and increased risk for accidents. Hence, evaluation of a person's sleep health is vital to any medical examination. Questionnaires such as Pittsburgh Sleep Quality Index (PSQI) have an important role in the preliminary evaluation of sleep health. PSQI has been regarded as the standard instrument to measure sleep quality. It has been translated into several languages and has been validated in various populations. This study aimed to assess the validity and reliability of the Filipino version of the PSQI.

Methods: The Filipino version of the PSQI was administered to 200 adult subjects. After 24-48 hours, the English version of the PSQI was administered to the same respondents. Basic demographic information, co-morbidities and use of medications were obtained. Cronbach's alpha and Kappa test of agreement were measured to test the reliability of the Filipino version while confirmatory factor analysis was used to determine the validity of the translated tool.

Results: The Filipino version of the PSQI was reliable with Cronbach's alpha of 0.70. The agreement coefficient of all items in the questionnaire were all above 0.81 indicating a very good level of agreement between the English and Filipino versions. Confirmatory factor analysis showed that items Q1, Q3, Q4, Q5a-Q5i, Q6, Q7, Q8 and Q9 were significant with p-values below 0.05. Overall, as measured by the Goodness of fit, it showed that the items in the Filipino version of the questionnaire are directly correlated with English PSQI Score.

Conclusion: The Filipino version of the PSQI is a valid and reliable instrument to assess sleep quality. **(Author's abstract)**

Keywords: *Sleep, Sleep questionnaire, Sleep quality, Medicine*

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NP

0417

Validity and Reliability Testing of Indonesian Version of Orto-15: An instrument for orthorexia nervosa assessment

Warsini, Sri , Supriyanto,

Eating disorders are often underdiagnosed. Orthorexia nervosa (ON), a new type of eating disorder, is defined as excessive preoccupation with healthy eating, causing significant nutritional deficiencies and social and personal impairments. The ORTO-15 is a 15-item instrument widely used to evaluate orthorexia nervosa. It was developed by Donini et al (2005) in Italian and has been translated and adapted in other languages. In this study, the validity and reliability of the Indonesian version of ORTO-15 were assessed.

The Indonesian version of the instrument was then reviewed by experts after translation. The back-translation was assessed for consistency with the original instrument. The instrument was then statistically-tested for validity and reliability on 50 randomly selected subjects. The subjects were balanced in gender and the mean age was 19.4 + 0.8 years. The reliability was tested using Cronbach's alpha. The validity was tested using Pearson's product-moment correlation and confirmatory factor analyses (CFA).

The Pearson product moment verified good validity for the instrument (r = 0.369 – 0.881). CFAanalyses confirmed good communalities (extraction > 0.5) and revealed three components construct (cumulative 73.5%). Reliability test confirmed that the instrument had good reliability (Cronbach's alpha = 0.915).

The ORTO-15 Indonesian version is a valid and reliable instrument for the assessment of ON. **(Author's abstract)**

Keywords: *Eating disorder, Instrument, Validity, Reliability, Medicine*

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NP

0418

Viral Myopericarditis and Viral Encephalitis as manifestations of COVID-19 infection: A Case Report

Amorado-Santos, Florence , Gnilo, Mariean Rocielle D., Cruzat, Ke

Introduction: Coronavirus disease (COVID-19) is currently a global health crisis and is caused by a new strain of coronavirus. However, emerging literature of case reports noted possible extrapulmonary manifestations of the disease. Because COVID 19 is a relatively new disease, at present, little existing literature tackles the diagnosis and therapeutic management of COVIDâ€• 19â€• related conditions outside the pulmonary system.

Case: A 24-year-old male presented with sudden stiffening of all extremities but non-contrast computed tomography (CT) scan was unremarkable. Chest X-ray revealed interstitial pneumonia and SARS-CoV-2 RT-PCR (OPS/NPS) was positive. Electrocardiogram (ECG) findings showed supraventricular tachycardia and had elevated Troponin I levels. Pertinent physical findings noted were slurring of speech, dysmetria, and vertical nystagmus. The patient was initially treated as a case of Bacterial Abscess versus Viral encephalitis. Pericardial ultrasound revealed small pericardial effusion and was started on Colchicine. Repeat cranial CT scan noted unremarkable results but due to persistence of symptoms, the patient was started with Dexamethasone. On Day 16 of illness, the patient was noted to have full resolution of symptoms. Rapid antibody testing was done which revealed positive for both IgG and IgM hence the patient was discharged with the final diagnosis of Viral Myopericarditis resolved, Viral encephalitis resolved, COVID-19 pneumonia recovered.

Conclusion: Extrapulmonary manifestations have been reported increasingly as an atypical presentation of COVID 19 infection. Early recognition of viral myopericarditis and viral encephalitis as a manifestation of COVID 19 can lead to the initiation of proper treatment and management. More reports on these cases can aid future studies on diagnostics and therapeutic approaches during the COVID-19 pandemic. **(Author's abstract)**

Keywords: *Covid19, Viral myocarditis, Viral encephalitis, Case report, COVID-19, SARS-COV-2, Coronavirus infection, Medicine*

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NP

0419

The Yield of Malignancy for Early Fixation versus Routine Fixation of Pleural Fluid Samples

Orcasitas, Jessie F. , Yee, Richard Baron B. , Cortez, Ria Katr

Background: The etiology of pleural effusion remains unclear in nearly 20% of cases. One way to diagnose malignancy is by doing pleural fluid cytology. There are factors that influence the yield of pleural fluid cytology

and one of them is appropriate and timely fixation of samples. Currently, there is no local consensus regarding the timing with which the specimen should be fixed.

Objective: The study aims to compare the yield of malignancy between early fixation versus usual fixation of pleural fluid samples, meaning there is no set time for fixation to be done.

Methodology: The study employed a prospective cross-sectional research design. All patients with pleural effusion who fulfilled the criteria set by the study were included. Two sets of pleural fluid samples were collected amounting to 20cc each. First sample was assigned as Bottle #1 and placed immediately with fixative while the second sample was assigned as Bottle #2. Bottle #2 underwent routine fixation which follows no fixed or standard time of fixation. The time difference between the fixation of two sample groups greatly varied with Bottle #1 fixed immediately right after collection while Bottle#2 depends on the time it will be processed by the laboratory personnel. Both samples were submitted for cell block and cell cytology reading.

Results: Characteristics of the 55 patients included in the study showed age group range from 41 to 65 years of age, with 27 male and 28 female patients. Only one third had history of smoking. There were 21.82% who had family history of cancer and with and suspicious mass on chest radiograph. Out of 55 patients, 29 patients had history of previous diagnosis of cancer, 23 had recurrent pleural effusion, and 28 had chest radiograph with suspicious nodules. Based on gross appearance, there were 20 serous and 21 sanguineous pleural fluid noted. Mean cell count was high (1,115.50 ± 741.02) with lymphocytic predominance (82.56 ± 24.46). Elevated protein concentration (5,388.25 ± 8,230.46) and LDH (484.17 ± 248.72) were noted. Glucose (8.78 ± 6.68 mmol/L) was low. There were 21 patients who had high WBC, 24 with high protein and 16 with elevated LDH. There were 3 patients who were positive for AFB and none for KOH. Comparative analysis showed that the pleural fluid samples assigned to the routinely fixed group which were handed to the nurse after thoracentesis, then forwarded to the laboratory through a ward laboratory aide or patient watcherfor fixation with with 95% alcoholby thelaboratory personnel significantly had a longer duration of 406.62 minutes as compared to immediately fixed at 12.27 minutes (P<0.01). For diagnosis of malignancy, significantly more cases were diagnosed in the immediately fixed group with 36.36% cases versus 18.18% (p=0.016).

Conclusion: Among patients with suspected malignant pleural effusions, early fixation of pleural fluid samples resulted in higher histopathology yields as compared to those fixed after going through the routine fixation. **(Author's abstract)**

Keywords: *Malignant pleural effusion, Pleural fluid analysis, Lung malignancy, Medicine*

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NP

NUTRITION

0420

A Case Study on Undernutritionamong Children under Five Years of Agein Barangay Calumpang, Nagcarlan, Laguna

Maneja, Ma. Charina P. , Barrion, Aimee Sheree A. , Salvo, Regine Summer T., Lanorio, Ma. Cristina

Background. In 2020, Barangay Calumpang, a 2nd class municipality in Nagcarlan, Laguna recorded the highest prevalence of undernutrition among children under five years of age out of the 52 barangays.

Objectives. This study was undertaken to describe the factors possibly causing undernutrition among children under five years of age in Barangay Calumpang and provide key recommendations to improve their nutritional status.

Methods. The study used a descriptive research design wherein secondary data from the 2020 Barangay

Management Information System (BMIS) and Operation Timbang (OPT) 2021 was merged to extract the children's data. The Statistical Package for the Social Sciences (SPSS) was used for the principal component analysis (PCA) and creation of the wealth index. The children's nutrition situation and profile were also cross-tabulated.

Results. We included 28 children. Undernutrition was more prevalent in boys than girls. Most of the children had improved water sources, sanitation facilities, and waste disposal methods. The wealth index showed that half of the subjects were in the lower quintiles, and all were partially immunized. The most prevalent forms of undernutrition were severe underweight (36%) and severe stunting (39%). Other forms of undernutrition were also present in the barangay, such as underweight (14%) and severe wasting (14%). There was also a prevalence of 11% for both stunting and wasting.

Conclusion. Undernutrition was more frequent in boys, lower quintile households (stunting), and partially immunized children. Conducting gender-targeted nutrition programs, developing nutrition-focused livelihood programs, increasing awareness on the advantages of immunization, and promoting proper infant and child feeding practices were some of the recommendations given to improve the nutritional status of children under five. **(Author's abstract)**

Keywords: *Child undernutrition, Rural community, Philippines , Nutrition*

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NP

0421

Determinants of Overweight/Obesity among Filipino Adolescents: 2018 Expanded National Nutrition Survey

Duante, Charmaine A. , Ducay, Apple Joy D. , Dasco, Ma. Lilibeth P. , Platon-Desnacido, Josie, Angeles-Agdeppa, Im

The prevalence of overweight and obesity among children and adolescents has been increasing worldwide. In the Philippines, the prevalence of adolescent overweight/obesity showed an increasing trend – from 4.9% in 2003 to 9.2% in 2015 and 11.6% in 2018. Obesity increases the risk of cardiovascular diseases, diabetes, some cancers, and other non-communicable diseases. This study aimed to identify major potential determinants of overweight/obesity among Filipino adolescents from the Food and Nutrition Research Institute's Expanded National Nutrition Survey (ENNS). Univariate and multivariate analyses of the 2018 ENNS were done and included socio-demographic, socio-economic, clinical, and dietary data as potential determinants of adolescent overweight/obesity. Findings revealed that 12.0% of Filipino adolescents were overweight/obese. The odds of being overweight/obese was 75% (OR: 1.75; CI = 1.42–2.15; $p < 0.001$) higher with energy intake above requirements and 45% (OR: 1.45; CI = 1.25–1.67; $p < 0.001$) higher with protein intake above requirement. The risk of becoming overweight/obese in adolescents was higher among 10–12 yr old (OR: 1.61; CI = 1.23–2.10; $p = 0.002$), from households with less than five members (OR: 1.60; CI = 1.27–2.02; $p = 0.001$), living in urban areas (OR: 1.30; CI = 1.13–1.51; $p = 0.001$), from the richest wealth quintile (OR: 3.49; CI = 2.40–5.06; $p < 0.001$), whose households were food secure (OR 1.46; CI = 1.20–1.79; $p = 0.001$), and those household heads with at least college level of education (OR 1.56; CI = 1.15–2.13; $p = 0.008$), and who were physically inactive (OR: 1.41; CI = 1.08–1.84; $p = 0.016$). The dramatic rise in the prevalence trend of overweight/obesity among Filipino adolescents calls for integrated efforts of both the public and private sectors to focus on policies that would influence the promotion and support of overweight/obesity prevention. These findings may also serve as basis and inputs in modifying eating behaviors and the importance of increasing physical activity targeting the richest quintile in urban areas to help curb the overweight/obesity among adolescents. **(Author's abstract)**

Keywords: *Diet, Filipino adolescent, Lifestyle, Obesity, Overweight, Philippines, Nutrition*

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NP

0422

Drivers and Barriers of Whole Grain Consumption in the Philippines: 2019 Expanded National Nutrition Survey

Duante, Charmaine A. , Ducay, Apple Joy D. , Platon-Desnacido, Josie , Angeles-Agdeppa, Imelda, Phanvijhitsiri,

Whole grains are considered one of the best sources of dietary fiber, which is beneficial for good health across different population groups. However, consumption remains low in the Philippines. This study aimed to evaluate the drivers and barriers to the consumption of whole grains among Filipinos across all population groups. The study is part of the dietary component of the 2019 Expanded National Nutrition Survey (ENNS), wherein the master sample (MS) was adopted from the Philippine Statistics Authority (PSA). The ENNS is a two-stage cluster sampling design that covered 39 provinces and highly urbanized cities (HUCs) in the Philippines. About 78% of the 141,167 individuals, aged 3 yr old and above, who were sampled participated in the survey. Generated data were analyzed using STATA version 15.0. Slightly less than half of the participants (48.4%) consumed whole grains and products. The highest proportion of current consumers was from the highest income quintile (57.1%) and those residing in urban areas (49.6%). The most commonly described consumption pattern was consuming every month (38.7%), and the most common mealtime consumption was during breakfast (43.2%). Among consumers, reported drivers of consumption were as follows: good taste (56.1%), preference or habit of consuming (25.9%), beneficial and good for health (16.0%), convenient to eat, or easy to prepare (11.1%), and attractive packaging (9.7%). Among participants 15 yr old and above, more than half of whole grains were unaware of the health benefits of whole grain consumption, although approximately 20% perceived that the health benefit of whole grains is that they can “make you feel full.” The barriers to consumption were high cost (39.7%), lack of access or availability (36.6%), and bad taste (22.7%). Only half of the Filipinos surveyed were consumers of whole grains and products, and often they are only consuming these once a month. Lack of awareness of its beneficial effects, high cost, inaccessibility, and taste are the barriers to whole grain consumption. In order to increase whole grain consumption, it is suggested that actions to develop simple messages based on the drivers of consumption should be provided across varied communication channels, including social media, to fully address the barriers to whole grain consumption. **(Author's abstract)**

Keywords: *Whole grains, Drivers, Barriers, Consumption, Filipinos, Nutrition*

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0423

Effects of Gamma Irradiation on Physicochemical and Sensory Properties of Cooked Beef Sausages

Abedi, Abdol-Samad , Mostashari, Parisa , Eskandari, Soheil , Ghasemzadeh-Mohammadi, Vahid , Ferdousi, Roholla, Mahmoudzadeh, Mar

Gamma irradiation could be considered a promising technology to extend food products' shelf life. Emulsion products with 40 and 65% meat contents were irradiated at 2, 4, 6, and 8 kGy doses. Residual nitrite, total volatile basic nitrogen (TVB-N), and thiobarbituric acid (TBA) values were measured during 0, 7, 14, 21, and 28 d of storage at 4 ËšC. The color was analyzed at weeks 0 and 4 during storage. Irradiation at 8 kGy significantly ($p <$

0.05) reduced nitrite residues in both groups. The TVB-N value in the irradiated samples was significantly lower than in the non-irradiated samples. Also, the high irradiation doses at 6 and 8 kGy significantly ($p < 0.05$) reduced the red index (a-value) and increased the TBA values of both products. High malondialdehyde contents were induced by high irradiation doses. Sensory evaluation results showed that the 8-kGy-treated products had the lowest color, taste, and odor scores, whereas 2 and 4-kGy doses could be suitable to maintain sensorial characteristics. Overall findings suggested the use of lower gamma irradiation doses to decrease residual nitrite and extend the shelf life of meat products. **(Author's abstract)**

Keywords: *Chemical properties, Gamma irradiation, Meat products, Sensory evaluation, Nutrition*

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0424

Knowledge and Practice on Nutrition Facts Panel Among Young Adults Aged 19 to 30 Years Old in the National Capital Region, Philippines

Bullecer, Ernani R. , Lopez, Noymee A

This study determined the knowledge and practice of young adults aged 19–30 yr old on the nutrition facts panel (NFP) and the association between the two. A self-administered pre-tested online survey was used to gather the data. A total of 406 valid responses were acquired and analyzed. The majority of the respondents have a low level of objective knowledge and have either low or intermediate levels of subjective knowledge. The frequency of correct answers in each objective knowledge question showed that most respondents can interpret certain NFP information when no difficult computation or analysis is required. However, only a few (8.87%) respondents can interpret more technical information such as the recommended daily energy intake. Moreover, it was found that having high (p-value= 0.002; OR:4.84; 95% CI: 1.76–13.33) and intermediate (*p*-value= 0.004; OR:1.97; 95% CI: 1.25–3.11) objective knowledge were significantly associated with NFP use. Similarly, high (*p*-value< 0.001; OR: 10.93; 95% CI: 4.32–27.68) and intermediate (*p*-value< 0.001; OR:3.84; 95% CI: 2.50–5.92) subjective knowledge were significantly associated with NFP use. The results emphasized the improvement of nutrition education and promotion, especially in understanding specific technical information and comparing different NFPs. These interventions should aim at improving the nutrition knowledge of young adults to help them in using the NFP. **(Author's abstract)**

Keywords: *Knowledge, Nutrition labeling, Young adults, Nutrition*

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0425

Nutrition-sensitive Agriculture (NSA) Program Implementation and Learnings in CALABARZON

Dy, Marison Felicidad R. , Tandang, Nancy A. , Juanico, Clarissa B. , Africa, Leila S. , Talavera, Maria Theresa M. , dela Luna, Kim Leon

The importance of agriculture across the different Sustainable Development Goals (SDGs) results from its increased relevance to long-term developmental consequences that affect children and other vulnerable groups. Although encouraging progress has been achieved in documenting nutrition-sensitive agriculture (NSA) in

community-based programs through analyses of existing data, much remains to be learned about what, how, and at what cost agriculture can contribute to improving nutrition outcomes. This study aims to explore the perceptions and understandings of local agriculture planners towards NSA in CALABARZON, Philippines. It also aims to describe the current position of the local agriculture planning in the study area. Data were collected using a phenomenological study design using two focus group discussions and five key informant interviews. Municipal agriculturists, municipal agriculture officers, agriculture extension workers, municipal nutrition action office (focus groups), and provincial agriculture officers (key informants) were recruited. Patterns were identified through a rigorous process of data familiarization, data coding, theme development, and revision. It was observed that NSA is a new concept among the local agriculture planners in the study area. Understanding of the participants on NSA mainly focused on improving the nutrient content of the crops produced to improve the nutrient intake of the population. Although the agriculture office has conducted several programs related to nutrition in the past, the continuity of the projects was not sustained. Thus, there is a need to increase the awareness of local institutions towards the importance of improving the nutrition sensitivity of local agriculture plans. **(Author's abstract)**

Keywords: *Local agriculture planners, Nutrition, Nutrition-sensitive agriculture, Nutrition*

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0426

Prevalence and Factors Associated with Hypertension among Filipino Adults in Different Survey Periods

Duante, Charmaine A. , Dasco, Ma. Lilibeth P. , Cristobal, Antoniette G. , Inso, Karla Denice A. , Ducay, Apple Joy D. , Parani, Maria Stephanie N. , Patalen, Ch

In the Philippines, the prevalence of hypertension among adults, 20 years old and above, increased from 2003 to 2015 but declined significantly in 2018–2019 based on the National Nutrition Surveys conducted by the Department of Science and Technology–Food and Nutrition Research Institute (DOST-FNRI). Understanding this downward trend and the factors associated with hypertension could contribute toward the reduction in the prevalence of hypertension by 33% between 2010 and 2030. This study determined the trends and factors associated with hypertension among adults, 20 years old and above, using the data on anthropometry, blood pressure (BP), fasting blood glucose, and behavioral and dietary risk factors of non-communicable diseases collected in 2013, 2015, and 2018–2019 surveys. Marchevsky equation was used to determine the true prevalence of hypertension. Descriptive and multivariable logistic regression analyses were done using Stata version 15.0 to determine the general characteristics of participants and factors associated with hypertension, respectively. Results showed that the prevalence of age-standardized hypertension increased from 21.0% in 2013 to 23.7% in 2015 but declined to 17.1% in 2018–2019. The percentage of controlled hypertension improved from 20.7% in 2015 to 29.4% in 2018–2019. The use of anti-hypertensive medicines also increased in 2018–2019. Age, 60 years old and above, belonging to the upper wealth quintiles, obesity, high waist circumference and high waist-hip ratio, alcohol drinking, and binge drinking, were positively associated with hypertension in the three survey periods. Programs and policies should be intensified focusing on regular BP monitoring, adherence to healthy lifestyle advice, patient-centered treatment plan, and systematic follow-up. Strategies to address obesity should also be reinforced by reducing sedentary activities through engaging in physical activities. **(Author's abstract)**

Keywords: *Adults, Blood pressure, Hypertension, Non-communicable diseases, Nutrition survey, Prevalence, Nutrition*

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0427

Shelter-based Food Preparation Intervention and Subjective Well-being of Pediatric Cancer Patients in Manila, Philippines

Agustin, Estrella R. , Chua, Consuelo T. , Aquino, Maria F

Among the major concerns in pediatric cancer patients are their emotional and social well-being arising from the unpleasant physical and psychological side effects of treatments. However, studies have shown that food preparation improves cancer patients' emotional and social well-being. The general objective of the study was [1] to assess the relationship between food preparation intervention and subjective well-being (SWB) of cancer patients, as well as [2] to determine the children's socio-emotional SWB before and after the food preparation activity implementation based on the perspectives of the patients, parents, and shelter staff'. Eight pediatric patients between 8–20 yr old, their guardians, and two shelter staff were purposively selected. A food preparation activity module was designed and implemented as part of the intervention measures. The patients, parents, and staff were interviewed to assess the patients' emotional and social SWB before and after the activity implementation. Content and thematic analyses were used to analyze the data. The results of the study revealed that the patients' emotional and social SWB improved right after implementation and even 3 mo after the intervention. The positive aspects of emotional SWB documented among the patients after implementation were happiness, hopefulness, gratitude, and self-confidence. The positive contributions of the activity 3 mo after its implementation were still evident. Regarding social SWB after the intervention, it was established that cooking activities encourage collaboration and social bonding among family members and the patients themselves. Three (3) mo after intervention, the patients became more outgoing, friendly, and helpful, especially towards their fellow cancer patients. The study can help researchers explore different age groups and chronic disease cases using similar food preparation activities and modules as a guide. **(Author's abstract)**

Keywords: *Cooking activity, Food preparation, Nutrition education, Subjective well-being, Nutrition*

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0428

Validity of Body Roundness Index to Screen Abnormal Blood Lipid among Filipino Adults

Fernandez-Patalen, Chona , Bullecer, Ernani R. , Morillo, John Ca

The body roundness index (BRI) was developed to provide a more accurate numerical quantifier of body roundness. The capability of BRI to predict body fat and visceral adipose tissue provides an impression that it may be capable of relating to cardiometabolic risks. This present study utilized the 8th National Nutrition Survey to determine the validity of BRI to screen for abnormal blood lipids among Filipino adults. The area under the receiver-operating characteristics curve (AUC) was used as the validity measure. BRI had AUCs of 0.641 (95% CI: 0.627–0.655) in men and 0.635 (95% CI: 0.621–0.649) in women. In terms of criterion validity, the AUCs of BRI were compared to the AUCs of widely accepted anthropometric indices – namely, body mass index (BMI), waist circumference (WC), and waist-hip ratio (WHR). BRI significantly outperformed WHR in men, BMI in women, and WC in both sexes in screening abnormal blood lipids. Therefore, BRI had a discriminative capability to screen for abnormal blood lipids among Filipino adults. The optimal BRI cut-off points for screening abnormal blood lipids were identified as 2.71 for men and 3.44 for women based on [a] the maximum Youden Index value and [b] a rule that sensitivity should be greater than specificity. Filipino adults whose BRI exceeds the sex-specific cut-off points for screening abnormal blood lipids might consider further screening or diagnosis of abnormal blood lipids for effective case management. **(Author's abstract)**

Keywords: *Anthropometric index, Abnormal blood lipid, Body roundness index, Dyslipidemia, Screening tool, Validity, Nutrition*

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PHYSICS

0429

Chemical Extraction of Chitin and Chitosan Biopolymers from *Portunus pelagicus* Crab Shells

Manzano, Maria Carla F. , Mariposa, Brian Justin V. , Patawaran, Aeioun Francis M. , Buensalido, Andrew Ja

Annually, the Philippines produces around 25,000-35,000 metric tonnes of blue swimmer crabs (*Portunus pelagicus*). Consequently, significant amounts of crab waste are generated, leading to a variety of waste management problems. High-value materials chitin and chitosan can be extracted from the shells of crustaceans and have been the focus of research in various fields for their potential food industry, geoenvironmental, and materials engineering applications. This study examines chitosan biopolymer derived from crab shell waste using the chemical method of extraction. Chitin and chitosan were successfully synthesized from *Portunus pelagicus* shells using the chemical method of extraction with a percentage yield of 69.4% and 55.3%, respectively. **(Author's abstract)**

Keywords: *Solar cells, Cuprous oxide, Chlorophyll, Moringa oleifera, Physics*

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0430

Comparative Study on Determination of Critical Minerals in Ni Laterites Using Handheld LIBS, Handheld XRF, and ICP-MS

John Henry C. Gervasio, Rachelle Clien G. Reyes, Monica Joyce V. Peralta, George V. Catague, Jr., , Quierrez, Rico Neil M. , Tanciongco, Alexandria M. , Samaniego, Jessie O. , Montano, Mariel O. , Gibaga, Cris Reven L., Gibaga, Cris Reve

Critical minerals (CMs) such as nickel (Ni), cobalt (Co) Co, chromium (Cr), manganese (Mn), and zinc (Zn) are materials essential to the economy, but the supply is vulnerable to disruption. Ni laterite deposits are considered potential sources of these CMs. In this study, the Ni, Co, Cr, Mn, and Zn contents of 15 Ni laterite samples from Zambales and Surigao were determined using handheld laser-induced breakdown spectroscopy (hLIBS) and handheld X-ray fluorescence (hXRF) analyzers. The samples were also analyzed using inductively coupled plasma mass spectrometry (ICP-MS) to compare the handheld analyzers with the established laboratory technique. The two-sided t-tests show no significant differences between the average Ni, Cr, Mn, and Zn results of hLIBS and hXRF with respect to ICP-MS. The average hXRF result of Co significantly differs from ICP-MS, whereas hLIBS has no significant difference from ICP-MS. Therefore, hLIBS and hXRF can be used to determine the Ni, Cr, Mn, and Zn contents in laterites, whereas hLIBS can be utilized to determine the Co values of laterites. Both hLIBS and hXRF analyzers can be for CM exploration of Ni laterite deposits. **(Author's abstract)**

Keywords: *Cobalt, Critical minerals, ICP-MS, LIBS, Ni laterite, XRF, Physics*

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0431

Comparative Study on Determination of Selected Rare Earth Elements (REEs) in Ion Adsorption Clays Using Handheld LIBS and ICP-MS

Quierrez, Rico Neil M. , Tanciongco, Alexandria M. , Samaniego, Jessie O. , Montano, Mariel O. , Gibaga, Cris Re

The rare earth elements (REEs) are crucial components of green technology and are now considered critical raw materials. One of the emerging tools in mineral exploration, laser-induced breakdown spectroscopy (LIBS), was used by several studies to determine the REE contents of different geological materials. In this study, the concentrations of selected REEs (La, Ce, Pr, Nd, Sm, Gd, Dy, and Yb) in 11 ion adsorption clays (IACs) from El Nido, Palawan, Philippines were determined using a handheld LIBS analyzer. The REE contents of the samples were also determined using inductively coupled plasma mass spectrometry (ICP-MS) to compare LIBS with the established laboratory technique. The two-sided t-test shows no significant differences for the average La, Ce, Pr, Nd, Sm, and Gd results of LIBS and ICP-MS, whereas Dy and Yb have significant differences. Based on these results, it can be concluded that LIBS can be an alternative to ICP-MS for the rapid determination of some REE in IACs. **(Author's abstract)**

Keywords: *Handheld LIBS, ICP-MS, Ion adsorption clay, Palawan, Rare earth element, Physics*

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0432

Convolutional Neural Network Analysis of BG Regale, the *Sansevieria rorida* Radiation Mutant

Alinsug, Malona V. , Sahagun, Jorge R. , Delos Reyes, Ian Val P., Deocaris, Custer

Phenotypic screening in plant breeding is essential for identifying superior mutant lines for ornamental plant variety development. However, the process is tedious and time-consuming involving both qualitative and quantitative methods. To fast-track phenotypic screening, artificial intelligence (AI) presents a promising tool with higher efficiency and minimal standard error in identifying mutant lines for registration. Thus, in this study, an algorithm for classifying novel ornamental plant varieties is proposed. After training a convolutional neural network (CNN) model with the images of radiation mutant BG regale and control, *Sansevieria rorida*, comparisons of model loss and accuracy were done with Adam, SGD, RMSprop, and Adadelta optimization techniques. Among the optimization techniques, RMSProp achieved the lowest model loss (3.68%), the highest accuracy (98.44%), precision (98.44%), recall (98.39%), and F1-score (98.39 %). In this "proof-of-concept" study on the Philippines' PHP 10 M (equivalent to USD 178,700; PHP 1 = USD 55.96) BG Regale, one of the world's most expensive ornamental plants, we introduce the idea of AI-aided facilitation of large-scale phenotype selection during mutation breeding and varietal screening for SEPOPs (or super-expensive Philippine ornamental plants priced at more than PHP 100,000 per leaf). **(Author's abstract)**

Keywords: *Artificial intelligence, Convolutional neural network, Image classification, Plant mutation breeding, Phenotyping, Philippine ornamental plants, Physics*

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0433

Exact solutions of oscillator-inspired differential equations

Rodulfo, Emman

Exact solutions to certain homogeneous 2^{nd}-order differential equations are presented by exploiting their links with the classical oscillator differential equation. The veracity of the exact solutions may be confirmed by the standard Fröbenius series solution, which we carry out for the Embden-Fowler differential equation. **(Author's abstract)**

Keywords: *Homogeneous 2nd order differential equations, Newtons 2nd law of motion, Frobenius method, Fuchs theorem, Non-essential singularity, Simple harmonic oscillator, Damped oscillator, Embden-Fowler differential equation, Logarithmic differential equation, Physics*

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0434

Investigations on the Leaf Surface Ultrastructures in *Hibiscus tiliaceus* Linn.: An Inspiration for Future Biomimetic Applications

Garcia, Emmanuel , Lawas, Cresencia M. , Resurreccion, Nesse Grace U., De Los Reyes, Mariquit

Biomimetics harnesses nature-inspired principles and properties in the design and synthesis of advanced materials that address simple to complex problems, pushing innovation and ingenuity beyond limits. The use of plants as biological models has provided the necessary stimulus for biomimicry. In this study, the abaxial (bottom) and adaxial (top) leaf surfaces of *Hibiscus tiliaceus* Linn. were investigated with respect to two parameters: ultrastructures that define the surface morphology, and wetting behavior that is influenced by the hydrophobic or hydrophilic property of the plant leaf. Imaging techniques show that the abaxial side of the leaf consists of a dense network of non-glandular, simple, 8-arm stellate trichomes that are overlapping and intertwined. The adaxial side consists of the same type of trichomes, but with shorter stellate arms, sparsely arranged on the surface, and appears more appressed to the leaf lamina. Results of the contact angle measurements showed that the adaxial surface is hydrophilic (71.71° ± 4.14°) while the abaxial surface is nearly superhydrophobic (142.98° ± 2.92°). Images from atomic force microscopy, plots of height density versus nanostructure height, and log (PSD/nm^4) vs frequency (per μm) show a higher variation in nanostructure height for the adaxial surface. While roughness is higher on the adaxial surface, fewer single stellates are seen, unlike the greater trichome coverage observed on the abaxial side. The effect of a homogenous overlay of dense stellates on the abaxial surface, and the height variations of nanostructures on these stellates, result in a more effective overall roughness which can explain the nearly superhydrophobic property exhibited by the bottom side. This corroborates published studies that the hierarchy or complexity of surface ultrastructures can be associated with the properties and functions exhibited by plants. This is the first report on the surface morphology and wetting behavior of *H. tiliaceus*. Data provided in this work will be useful in exploring the future biomimetic potential of the plant, say in the areas of bioremediation and self-cleaning technologies. **(Author's abstract)**

Keywords: *Hibiscus tiliaceus Linn, Trichomes, Wettability, Biomimetics, Physics*

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0435

Kinks and Inflections as Temporal Markers in Flattening an Epidemic Curve

Rodulfo, Emman

A certain amount of time after the implementation of intervention to control an outbreak, a kink develops in the epidemic curve. These discontinuities in the gradient of the curve should be treated as observables as they confirm the effectiveness of interventions that began in the past. As a retarded response time of an epidemic to intervention, this may be used to parametrize the effectiveness of the intervention in flattening the curve. To construct a model that recognizes how this kink heralds the flattening of the curve, we draw upon the qualitative features of the S-J-R model, but in recognition of the role of the kink, we forego smoothness of the curve at this transitional stage. With these in mind, we formulate an analytic expression for the fraction of the population infected by a contagious disease spreading according to some power law, and responsive to a delayed intervention. Up to the time when the effect of the intervention manifests, instead of using the conventional exponentially increasing function known to over-estimate the data, the outbreak is modeled by a real power function which more closely describes the accelerated stage of epidemics. The moment the intervention takes effect, a decaying exponential function with a characteristic time defined by the viral power and the time of the appearance of the kink is introduced to flatten the power curve. The model provides a calculation for the peak of the epidemic as well as the inflection times when rate of change in the number of infectives is extremum. The recent Philippine May 23, 2020 data on COVID-19 pandemic is used in sample calculations. **(Author's abstract)**

Keywords: *Epidemiology, Epidemic curve, Exponential growth and decay, Sub-exponential growth, Power function, S-J-R model, Gamma/factorial function, Binomial expansion, Critical points, Stationary points, Curvature, Concavity, Inflection points, Kink, Covid-19, Incubation period, Recovery period, Social/physical distancing, Community quarantines, Physics*

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0436

Matched Narrow-beam, High-intensity IRED Pairs for Improved Selectivity & Sensitivity and Cost-Effective Non-Invasive Blood Glucometers

Delos Reyes, Renei Beatriz , Manzano, Maria Carla F. , Masangkay, Clyana Dhannereen , LogroÃ±o, Edryd Psalm , Mendoza, Sandra Paulene , Manzano, Daniela Niccole, Manzano, Enrique

This paper seeks to find a way to measure blood glucose levels in real time, in-situ, non-invasively, painlessly, and cost-effectively using matched LED pairs as photo-transmitter and photo-detector. The research demonstrated the feasibility of using the same high-intensity, narrow-beam transmitter LED as photo-detector, improving selectivity and sensitivity. Using a near-infrared LED (GaAlAs, 895 nm, 20mW, 8° half-power beam width), the following relationship between signal attenuation at the detector versus the glucose concentration in solution was obtained:

Glucose Concentration = 0.004(NIR LED output Voltage) + 9.2707 with a very high Pearson's Correlation Coefficient of +0.9985 and a coefficient of determination of 0.9971, highly correlated and highly linear. **(Author's abstract)**

Keywords: *Non-invasive blood glucometer, LED-based glucometer, Physics*

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2019,
(Filipiniana Analytics)
NP

0437

Molecular Dynamics Simulation of Carbon Nano-Film and its Stress/Strain using LAMMPS (Large-scale Atomic/Molecular Massively Parallel Simulator)

Santos, Gil Nonato C. , Ederadan, Maxara Nicole S. , Gaddi, Abraham Joel P. , De Guzman, Carlo L. , Dela Cruz, Rja

This research investigates the stress, strain, and structure of simulated carbon nanofilm through the LAMMPS software. This study also aims to create a simulation of a carbon nano-film model and have its strength tested in the simulation process. We simulated different shapes and sizes in a computer-generated environment will help us understand the material's characteristic and how the material interacts with other objects in its environment. By designing the film in the software, the strain of the carbon film can be measured. In the completion of this study, we found out that the shape that performed the highest is the block shaped nano-film and the smaller sizes perform with the same strength and endurance whether it be their Young's modulus or ultimate tensile strength. The model with the strongest structure is the block shaped nano-film with a size of 1000 cubic units, a Young's modulus of 688.67 GPa, and an ultimate tensile strength of 134.40 GPa. **(Author's abstract)**

Keywords: *Carbon nano-films, Youngs modulus, Ultimate tensile strength, Molecular simulations, Physics*

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(Filipiniana Analytics)
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0438

Morphological and Elemental Studies of Zinc Oxide- and Sodium pToluenesulfonate-doped Polypyrrole Films

Manzano, Enrique M. , Manzano, Maria Carla F. , Alcantara, Norbe

Galvanostatic and galvanodynamic methods of electrochemical deposition were employed to fabricate conducting polypyrrole (PPy) film electrodes for supercapacitor applications. In this method, zinc oxide- and sodium ptoluenesulfonate- doped film electrodes were electrochemically synthesized in an aqueous solution containing 0.10M pyrrole as monomer and 0.12M sodium ptoluenesulfonate (Na-pTS) as dopant and 0.1M zinc oxide (ZnO) as co-dopant. A two-electrode electrochemical cell was used, and for counter and working electrodes, stainless-steel plates. The applied current density during synthesis was kept at 4mA/cm^2 with varying duty cycle of 25%, 50%, 75% and 100%, respectively. The thickness and surface morphology of the Zno/NapTS/PPy films grown were obtained using scanning electron microscopy. The ZnO/NapTS/PPy films have average thickness ranging from 30.60 µm to 1688.0 µm. The surface morphology of ZnO/NapTS/PPy film synthesized at constant current (100% duty cycle) exhibits lamellar and spherulite structures associated with increased conductivity. The measured AC resistance of the ZnO/NapTS/ PPy films ranged from 0.64 ? to 3.9 ?, with the films synthesized at 100% duty cycle showing the lowest AC resistance. **(Author's abstract)**

Keywords: *Supereapacitor, Conducting polymers, Polypyrrole, Physics*

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0439

Nanomanipulation of Metal Oxide Nanomaterials

Koledov, Victor , Santos, Gil Nonato C. , Olarve, Raymund S. , Sajor, Normie Jean, Gratowski, Svetl

Metal oxide nanomaterials from zinc oxide bulk powder and tin (II) oxide bulk powder were synthesized via Horizontal Vapor Phase Crystal Growth deposition technique. Fabricated nanocrystals were successfully deposited on a silica quartz tube and were used as the sensing element of a fabricated gas sensor. Both zinc oxide and tin oxide showed nanowire structures. This indicated a high surface-to-volume ratio which favors the adsorption of gases on the sensing element which increases the sensitivity of the device. **(Author's abstract)**

Keywords: *Znc Oxide nanomaterials, Tin Oxide nanomaterials, HVPG, Physics*

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2019,
(Filipiniana Analytics)
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0440

Nutritional Composition, Physicochemical and Functional Properties of Black Fonio (*Digitaria iburua* Stapf)

Egblewogbe, Martin N.Y.H. , Agbemavor, Wisdom S.K. , Ayeh, Ernestina A. , Ocloo, Fidelis C.K., Odai, Bernard

This study evaluated some physical, physicochemical, and functional properties of three fonio types (early maturing, intermediate maturing, and late maturing) cultivated in the Northern part of Ghana. Black fonio types were purchased from a local farmer at Chereponi, sorted, milled, and stored for further analysis. Nutritional composition, physicochemical and functional properties were determined using appropriate methods. Proximate and nutritional compositions of the black fonio types varied. Thousand-grain weights and bulk density of the fonio types ranged from 0.407–0.513 g and 0.655–0.688 g/mL, respectively. Water absorption capacity, solubility, and swelling power of the samples ranged from 1.63–1.97 mL/g, 5.43–6.27%, and 5.88–6.33 g/g, respectively. Viscosities of the intermediate fonio types were lower than those of the other two fonio types. The fonio samples showed a typical A-type crystal starch structure. The three fonio types studied have potential applications in infant weaning food formulations and even in bakery and related products to address food security, particularly in sub-Saharan Africa. **(Author's abstract)**

Keywords: *Fonio, Nutritional composition, Pasting viscosity, Physicochemical, XRD, Physics*

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0441

Polymer-Based Graphene Nanocomposite Coating with Anticorrosion and Anti-Barnacle Properties

Haygood, Klaud Jenssen , Foronda, Juanito Raphael , Briones, Jonathan , Sajor, Normie Jean, Santos, Gil Nonat

We investigated the anticorrosive, hydrophobic and anti-barnacle properties of polyaniline and graphene (PANI/G) nanocomposite filler in the coating matrix applied to ship hulls. Various formulations of graphene were integrated to polyaniline matrix through in situ polymerization. It was observed that the 0.5%, 1.0%, and 2.5% by weight graphene formulation performed better than the counterparts with higher amount of graphene content as barrier protection. The various coating formulations were applied directly to the metal coupons. It was also observed that the PANI/G nanocomposite exhibited a hydrophilic property. The addition of polysiloxane to the mixture resulted in a hydrophobic surface with a contact angle of 108 degrees. Results show the absence of barnacle growth on metal samples coated with PANI/G/polysiloxane formulation. It is proposed that this anti-barnacle property is due to the hydrophobicity of the surface. **(Author's abstract)**

Keywords: *PANI, Graphene, Polysiloxane, HVPG, Physics*

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NP

0442

Potential Utilization of 12 Climbing Bamboo Species Found in Luzon Island, Philippines

Daguinod, Shereyl A. , Alipon, Marina A. , Marasigan, Oliver S. , Bondad, Elv

The study was conducted to determine the physical and mechanical properties of 12 species of climbing bamboo collected from Luzon, Island Philippines, *viz. bolo* [*Cyrtochloa fenixii* (Gamble) S. Dransf], *baitu* (*Cyrtochloa hirsuta* S. Dransf. comb. nov.), *luzon bikal* [*Cyrtochloa luzonica* (Gamble) S. Dransf], *bikal baboy* [*Cyrtochloa major* (Pilg.) S. Dransf. comb. nov.], *puser* [*Cyrtochloa puser* (Gamble) S. Dransf. comb. nov.], *bukawe* [*Crytochloa toppingii* (Gamble) Dransf.], *bikal* [*Dinochloa acutiflora* (Munro) S. Dransf. comb. nov.], *tagisi* (*Dinochloa dielsiana* Pilger), elmer *bikal* (*Dinochloa elmeri* Gamble), *baguisan* (*Dinochloa pubiramea* Gamble), *bagtok* (*Cephalostachyum mindorense* Gamble), and *yaho* (*Cephalostachyum mindorense* Gamble). The physical and mechanical characteristics were determined using the ASTM D143. For physical properties, *luzon bikal, bukawe, bagtok*, and *baitu* showed the lowest green MC (64.26, 91.96, 93.40, and 94.25%, respectively) but gave the highest relative density (0.777, 0.603, 0.630, and 0.619, respectively). Baguisan, on the other hand, showed the highest tangential (11.99%), radial (14.28%), and volumetric shrinkage (24.24%). For longitudinal shrinkage, *yaho* (0.91%) gave the highest value. From the bottom to the top portion, a decrease in MC and an increase in RD were observed. For the shrinkage properties, various trends along the height levels of the bamboo were observed. Various trends in mechanical properties at green condition, highest fiber stress at elastic limit (FSEL), modulus of rupture (MOR), and modulus of elasticity (MOE) were observed on *luzon bikal* (46.48 MPa, 70.07 MPa, and 11.50 GPa, respectively) and *bagtok* (40.69 MPa, 79.05 MPa, and 11.36 GPa, respectively). Similarly, these species showed the highest compression parallel-to-grain with node (56.11 and 42.66 MPa, respectively) and without node (58.52 and 44.60 MPa). On the other hand, the highest shear strength with and without node was observed in *bagtok* (13.22 and 8.68 MPa, respectively) and baitu (10.16 MPa and 7.53 MPa, respectively). The significant differences among species might be due to differences in relative density and height levels. Based on the DOST-FPRDI strength classification, *baitu, luzon bikal, bikal baboy, bagtok, yaho, puser*, and *bukawe* are suited to applications where the large diameter is not required such as construction, high-grade furniture, and flooring where both strength and durability are required. *Bolo, tagisi*, and *elmer bikal*, on the other hand, are suitable for high-grade furniture, paneling, automobile bodies, and musical instruments, whereas *bikal* and *baguisan* are suited for pulp and paper and low-grade furniture. The improved utilization of climbing bamboos

can give bamboo growers a wider range of options for plantation establishment and bamboo product manufacturers more choices for their raw materials. **(Author's abstract)**

Keywords: *Bamboo, Climbing bamboo, Mechanical properties, Physical properties, Utilization, Physics*

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(Filipiniana Analytics)
NP

0443

A Preliminary Study on the Surface and FTIR Spectra of the ZnO-Zeolite Composite Grown using Ion Exchange Process

Santos, Gil Nonato C. , Santos, Mary Gillian , Alcantara, Norberto T. , Faustino, Belinda B., Olegario, Eleano

The Philippine natural zeolites (PNZ) were doped with zinc using ion exchange process. Calcined and un-calcined samples of zinc oxide-zeolite (ZnO-PNZ) composites were characterized by using Fourier transform infrared spectroscopy (FTIR) and Scanning electron microscopy (SEM). The FTIR spectrum showed the characteristic peaks and structure of PNZ upon the incorporation of zinc oxide (ZnO). On one hand, SEM analysis confirms the formation of ZnO nanoparticles on the surface of zeolite. The calcination procedure did not alter the crystalline structure of the ZnO-PNZ composite. **(Author's abstract)**

Keywords: *Zeolite, Zinc-zeolite, FTIR, Ion exchange, Physics*

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2019,
(Filipiniana Analytics)
NP

0444

Recognizing and Visualizing Epileptic Seizure Based on Electroencephalogram (EEG) Using Spiking Neural Networks

Manzano, Enrique M. , Manzano, Maria Carla F. , Cosa, Shai

The application for machine learning was seen to be beneficial in the field of medicine, especially with the way current systems process electroencephalogram data (EEG) to detect and recognize seizures. This work is aimed at developing a simpler, cost-effective but equally accurate system of recognizing and visualizing epileptic seizures based on electroencephalogram data (EEG). Utilizing public EEG datasets, the study used current processes known in the field of data-science such as pre-processing the data to remove discrepancies, combined with the powerful integrated programming environment Python and external machine learning packages like Brian, the study created a Binary-classification neuron model, utilizing an leaky-integrate-and-fire model combined with an unsupervised learning algorithm called spike-time dependent plasticity (STDP) to provide the most accurate results during testing. The results exhibited a high sensitivity of the created neuron model, and it obtained an accuracy score of 94.6%. The proposed spiking neural network model has been found to be exceptionally efficient in recognizing and visualizing epileptic seizures in a binary classification example; however, multi-classification problems such as analyzing EEG data by multiple classifications will require a more complex SNN Model to be developed. **(Author's abstract)**

Keywords: *Spiking neural networks, Electroencephalogram, Epileptic seizure recognition and visualization , Physics*

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2022,
(Filipiniana Analytics)
NP

0445

Respiration Rate and Respiratory Quotient of *Musa Acuminata* (AAA Group) Bananas at Various Environmental Conditions

Santos, Anthony Gerard G., Manzano, Maria Carla F. , Manzano, Enrique

In this study, the respiratory quotient (RQ) and respiration rate (RR) of Lakatan [*Musa acuminata* (AAA group)] bananas were obtained for 14 days using a flowthrough system under three environmental conditions; in particular, nonairconditioned, airconditioned, and refrigerated with corresponding temperatures of 33°C ± 2°, 24°C ± 2°, and 7°C ± 2°, respectively. The Lakatan bananas were enclosed in glass gas-tight chambers and the carbon dioxide CO_2 and oxygen O_2 concentrations in the chambers were measured daily for 14 data. From the measured CO_2 and O_2 concentrations, values of RQ and RR were calculated. Results show that CO_2 concentrations generally increased during the ripening stage, from day 1 to 4, then decreased over time. Highest CO_2 variations, ranging from ~0.45 to ~0.83, were observed in bananas kept at 33°C ± 2°; while CO_2 variations were minimal for those stored at 24°C ± 2°. The O_2 concentrations were fairly constant over 14 days. Further, the O_2 concentrations measured from bananas kept at 7°C ± 2° were higher than those kept at 33°C ± 2°. The RQ values were found to decrease over time under all three temperature conditions. All the RQ values were less than one, which implies that lipid was the main metabolic substrate being oxidized all throughout the 14 days. It was also observed that the RQ values remain almost constant from day 7 to 14, and were higher, by as much as 13.1%, in bananas kept at 33°C ± 2° as compared to those at 7°C ± 2°. Results show that storage temperature is a major factor in measured RQ values. Measurement of RQ and RR these values could be used to determine the stage of fruit development and determine the optimum conditions to prolong the shelf-life of fruits. **(Author's abstract)**

Keywords: *Respiration Rate, Respiratory Quotient, Lakatan bananas, Physics*

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2020,
(Filipiniana Analytics)
NP

0446

Seebeck Effect in Polypyrrole/ITO Structures Synthesized via Pulsed-Galvanostatic Polymerization

Manzano, Enrique M. , Alcantara, Norberto T. , Lanuza, Chiara Rosario Julia V. , Llanes, Alyssa Marie , Lim, Miles Louis , Chavez, Raynor Kirkson , Caser, Ralph Lauren, Manzano, Maria Carl

As worldwide energy demands increase; new sources of renewable energy must be found. Thermoelectric generators have the potential to harness the vast amounts of waste heat coming off current machines, electronics, and infrastructure. In this study, conducting polypyrrole (PPy) doped with Na p-toluenesulfonate (Na-pTs) and hydroquinone sulfonic acid potassium salt ($C_3H_3SO_3K$) were electrochemically deposited on Indium-Tin-Oxide (ITO) glass slides at various duty cycles. Positive Seebeck coefficients were measured from all PPy(Na-pTs) /ITO structures, and on PPy($C_3H_3SO_3K$)/ITO structures synthesized at 20% and 40% duty cycles. Seebeck coefficients ranging from - 4.45 to 29.0mV/K were obtained. The Ppy(Na-pTs)/ITO structures exhibited higher Seebeck coefficients and open-circuit voltages than the PPy($C_3H_3SO_3K$)/ITO structures. **(Author's abstract)**

Keywords: *Physical systems, Polymers, Conducting polymers, Seebeck effect, Physics*

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0447

Self-similar trajectories from the firing angle of projectiles

Rodulfo, Emman

The essential properties of the projectile are revisited. General formulae for the firing angle of a projectile are presented. Certain manifestations of self-similarity determined by the firing angle of projectiles are explored. **(Author's abstract)**

Keywords: *Self-similarity, Golden ratio, Fibonacci sequence, Golden triangle, Golden gnomon, Five-fold symmetry, Scale invariance, Projectile, Kinematics, Firing angle, Maximum height, Range, Characteristic length, Physics*

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0448

Self-similarity in Physics

Rodulfo, Emman

A brief account of self-similarity manifest in certain physical phenomena is presented. In particular, the quantum harmonic oscillator is shown to be representable in terms of a self-similar matrix that contains the golden ratio as a special case. **(Author's abstract)**

Keywords: *Fibonacci sequence, Golden ratio, Self-similarity, Scale invariance, Conformal geometry, Conformal cyclic cosmology, Harmonic oscillator, Ladder operators, Creation and annihilation operators, Heisenberg uncertainty principle, Fock space, Coherent states, Physics*

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2019,
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NP

0449

A Study on the Correlation of Carbon Dioxide in the Breath and Blood Glucose Concentration

Hadloc, Vaschel Anne , BogÃ±albal, Mikaella F. , Calape, Pia Erlin R. , Santos, Myrtle Anne Marie G., Manzano, Maria Carla F. , Manzano, Enriqu

Glucose is a constituent of blood amongst humans and is the primary source of nearly all the energy in the cells and organs of the body. It is formed after the consumption of sustenance in which it is abundant in sugar levels. Glucose undergoes the process of glycolysis in order to oxidize and form adenosine triphosphate (ATP) molecules which provide our body the energy for cellular activities. Thus, having sufficient glucose in the blood is critical to a human's wellbeing. On the other hand, an excessive amount of glucose in the blood can lead to serious complications such as diabetes, a disease that damages the body's ability to process glucose in the blood and is the major cause of organ failures. Patients diagnosed with diabetes are advised to monitor their glucose levels using a portable electronic glucose meter which makes use of the invasive finger-prick method. However, this method is inconvenient for most patients because of its painful and distressing invasive process as this is repeated frequently. In response to a need for a less painful and convenient method for detecting blood sugar level, the authors report a non-invasive alternative method to blood glucose monitoring based on human breath analysis. Data and correlation studies show moderate correlation between breath CO_2 concentration and blood glucose level, indicating that breath CO_2 concentration can be used as a biomarker for blood sugar levels. **(Author's abstract)**

Keywords: *Glucose, Diabetes, Carbon dioxide, Non-invasive glucose monitoring, Breath analysis, Physics*

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2020,
(Filipiniana Analytics)
NP

0450

Synthesis of Zeolite Nanoparticles via Horizontal Vapor Phase Method for Wastewater Treatment Applications

Escuadro, Cathy , Toledo, Samuel Augustus , Faustino, Belinda B. , Santos, Anthony Gerard G. , Dolina, Mark Nathaniel , Diputado, Ven Jordan , Santos, Gil Nonato C. , Nasol, Kent Regil R. , Mendoza, Terrish Kylle P., Olegario, Eleano

The study combined zeolite nanoparticles of appropriate size for potential applications in wastewater treatment. Horizontal Vapor Phase Growth (HVPG) Technique was set up as the creation strategy, with a beginning material of 1 g powdered zeolite. Differed parameters incorporate baking temperatures of 1100°C and 1200°C and baking duration of 6 and 8 hours, while ramp time was held at 40 minutes. Spherical zeolite nanoparticles are prevalent in the fine-size range of 101 - 2,500 nm diameter, ultra-fine zeolite particles of $\leq$ 100 nm diameter, and coarse particles of > 2,500 nm diameter. Results from the pour-plate method show minimal microbial development when exposed to the zeolite nanoparticles in contrast with wastewater tests placed on an empty quartz tube. **(Author's abstract)**

Keywords: *Zeolite Nanoparticles, Horizontal Vapor Phase Growth (HVPG) Technique, Pour-plate Method, Physics*

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(Filipiniana Analytics)
NP

0451

Toxicity and Teratogenicity Assessment Using Zebrafish (Danio rerio) Embryo of Synthesized Zinc Oxide Nanomaterials Grown via Horizontal Vapor Phase Growth Technique

Villaflores, Oliver B. , Santos, Gil Nonato C. , Chang, Jasper James D., Deocaris, Custe

The study investigated the effect Zinc Oxide nanoparticle structures on the toxicity and teratogenicity towards zebrafish. Varying structures of Nano-Zinc Oxide crystals were synthesized at sizes similar to commercially available 50 nm to 100 nm particles and exposed to zebrafish embryo for a span of 5 days conducting toxicity and teratogenicity assay. While previous studies debated the result of commercially available Zinc Oxide nanoparticles, the synthesized Nano-Zinc Oxide demonstrated definite toxicity. An interesting finding showed that at higher concentration the zebra fish were eradicated at an early stage of the experiment but lower concentration created higher mortality rate in the end. **(Author's abstract)**

Keywords: *Zinc oxide, Nanomaterials, HVPG, Toxicity test, Teratogenicity, Physics*

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(Filipiniana Analytics)
NP

0452

Understanding Rabies Transmission Dynamics and Control in the Three Administrative Districts of Davao City Using a Modified SEIV Model

Oguis, Giovanna Fae R. , Diamante, Eliezer O. , Sepulveda, Maria Corazon B. , Marquez, Gloria N. , Eng, Ma. Noreen J. , Lagare, Arlene , Lachica, Zython Paul T. , Satur, Dejell Anne M. , Arandela, Xyza Mae F. , Rosero, El Veena Grace A. , Rosero, El Veena Grace A., Mata, May Ann

Despite the control programs of the City Veterinarian's Office (CVO), rabies is still geographically widespread across Davao City. Hence, a modified SEIV model incorporating different control strategies and adding population compartments focusing on reported rabies cases was formulated to understand dog rabies transmission dynamics. The model was fitted to the datasets of CVO from 2006–2020, such as the cumulative monthly positive rabies cases and the number of examined positive rabies samples in Talomo, Buhangin, and Poblacion districts. Results showed that the Talomo district had the highest rabies transmission rate but the lowest castration rate. On the other hand, the Poblacion district had the highest impounding rate and castration rate but the lowest birth and vaccination rate. Finally, the Buhangin district had the highest birth rate and vaccination rate but the lowest impounding rate and transmission rate. Sensitivity analysis (SA) was performed on over 10,000 samples of parameter space by the LHS method to obtain PRCC values. Results of the SA revealed that dog vaccination had a significantly strong influence among many interventions in mitigating rabies transmission – consistently in Talomo, Poblacion, and Buhangin districts. The results obtained in this study support the CVO's ongoing mass canine rabies vaccination campaign in the city as a method of rabies control. Despite this, dog population control strategies (*i.e.* castration and impounding) must still be implemented in addition to intensifying vaccination strategy, as the birth rate also strongly contributes to increasing rabies transmission. Through the model and data fitting approaches, this study has provided information on the level of control measures implemented in three districts and can also be utilized to develop future rabies epidemiological models in Davao City and other locations. **(Author's abstract)**

Keywords: *Control interventions, Model fitting, Rabies, SEIV model, Sensitivity analysis, Physics*

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2022 October,
(Filipiniana Analytics)
NP

0453

Zeolite Nanoparticles Grown via Horizontal Vapor Phase Crystal (HVPC) Growth Technique for Food Packaging Applications

Santos, Mary Gillian , Santos, Anthony Gerard G. , Sajor, Normie Jean , Maestre, Christian , Toledo, Samuel Augustus , Escuadro, Cathy , Santos, Gil Nonato C. , Pangga, Margaux R. , Cervania, Karl Angelo S.D., Lopez, Toni Beth , Olegario, Eleano

Spherical zeolite nanoparticles of varying sizes were successfully fabricated using Horizontal Vapor Phase Crystal (HVPC) Growth Technique. The starting material for the study was 1 gram of powdered zeolite that was baked under various growth conditions. Parameters include 4 hours, 6 hours, and 8 hours of baking duration, as well as temperatures of 1000oC, 1100oC, and 1200oC. Throughout the study, the ramp time for the furnace was set to 40 minutes. Characterization results from SEM and EDX analysis showed that spherical zeolite nanoparticles of fine, ultra-fine, and coarse sizes could be grown via the HVPC fabrication method. Aerobic plate count (APC) analysis was used to assess whether the fabricated zeolite nanoparticles inhibit bacterial growth on unrefrigerated fresh milk samples. Results from APC analysis revealed that fresh milk samples stored on zeolite NP-containing quartz tubes have minimal microbial growth compared to fresh milk samples stored on the original milk packaging. **(Author's abstract)**

Keywords: *Horizontal Vapor Phase Crystal (HVPC) Growth Technique, Zeolite nanoparticles, Aerobic plate count (APC) analysis, Physics*

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NP

SOCIAL SCIENCES

0454

Awareness and Perceived Implementation of Barangay Micro-Business Enterprise Act of 2002 (Republic Act 9178) in La Trinidad, Benguet, Philippines

Pinos-an, Jeftee Ben B. , Garambas, Cynt

Micro-business firms comprise more than 90% of the total micro, small and medium enterprises (MSMEs) in the Philippines. In La Trinidad, Benguet, almost all businesses are considered micro-enterprises. One of the government's ways of assisting the microbusiness entrepreneurs is through the Barangay Microbusiness Enterprise (BMBE) Act of 2002 or R.A. 9178. This study determined the level of awareness and implementation of the BMBE Law in La Trinidad, Benguet , and the correlation between microbusiness owners' profile and their level of awareness of the said law. The study respondents are micro-business owners, barangay leaders, and implementers of the law. Results revealed that food micro-business owners and the barangay leaders were generally both unaware, while the implementing agencies were partially aware of the BMBE law. Micro-business profile variables were weakly correlated with the awareness level. Concerning the implementation level, micro-business owners and barangay leaders generally perceived that the BMBE law is not being implemented in La Trinidad. In contrast, the implementers perceived that the provisions in the said law are partially being implemented. The implementerâ€™s concerns in fully executing the BMBE law are connected to the expected reduction of the municipality's revenue if every micro-business registers as BMBE. Hence, this study recommends a review of the BMBE law considering the types of enterprises in a municipality. Further, enhancements in entrepreneurial degree course curriculums may enhance awareness of the BMBE law. **(Author's abstract)**

Keywords: *Barangay Micro Business, Enterprise Act of 2002, Micro business owners, Barangay leaders, Implementing agencies, Social sciences*

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2021,
(Filipiniana Analytics)
NP

0455

Developing Sustainability Performance Indicators for Community-based Tourism in Caramoan, Camarines Sur and Jovellar, Albay, Philippines

Lo, Frechie Belle Otivar, Alejandro, Antonino

Tourism development in a community is often highly driven by tourist demand, setting aside the need to carefully plan tourism development. However, the lack of sensibly designed community-based tourism (CBT) indicators can hinder the identification and monitoring progress of the community towards its sustainability goal. Thus, this study attempted to determine the sustainability performance of Philippine CBT organizations and determine the key indicators that explain their sustainability performance. The focus of the study was the CBT organizations of Caramoan in Camarines Sur and Jovellar in Albay. There was a total of 196 respondents consisting of community stakeholders who were selected through purposive sampling. The study underwent two phases to achieve the research objectives. The first phase was the harmonization of various CBT indicators from established CBT standards and studies. From 25, it was narrowed down to 15 CBT indicators. After identifying the criteria to be used, the second phase involved statistical treatment of data through mean, standard deviation, and principal component analysis (PCA). The survey results showed the CBT organization's agreement with almost all the sustainability performance indicators, whereas they also depicted disagreement with quality accommodation. The result of PCA showed that five key indicators explain the sustainability performance of the two communities: socio-economic component, services component, tourist-community benefits component, community development component, and resources component. The study results can provide valuable information to detect sustainability problems and determine applicable CBT standards to achieve excellent performance in CBT operations, attain long-term CBT benefits, and serve as a useful benchmark in developing sustainability performance indicators for other CBT sites in the country. **(Author's abstract)**

Keywords: *Management performance, Rural development, Sustainability indicators, Tourism management, Social sciences*

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NP

0456

Effect of Lockdown on Food Security during the COVID-19 Pandemic in the Philippines: Two Months after Implementation

Sevilla-Nastor, Janice B. , Replan, Enrico L. , Sunga-Lim, Aywin Rosette , Faronilo, Kendrick Mico , Austria, Jonathan D. , Villanueva, Jessica D., Abuyan, Renante , Peyraube, Nic

The alarming presence of COVID-19 challenged the United Nations' (UN) Sustainable Development Goal 2 and made the World Health Organization (WHO) declare a public health emergency of international concern. Imposed lockdowns disrupted the supply and demand chain of the food systems, hence affecting food security. This research would like to know and assess the early effect (two months after the lockdown) of the enhanced community quarantine on food security in the Philippines. An online survey was employed participated by 331 household representatives using a survey instrument containing food security assessment, household sociodemographic characteristics, behavioral responses covering food purchase and consumption behavior, and emergency measure adoption. Statistical tests were applied: Mann-Whitney U test to know the behavioral response of the food secure vs. food insecure households, as well as the phi coefficient and Cramer's V test to determine and assess the parameters that plays important role in food security during this period. Results showed that 73% of the respondents were food insecure. The early effect of the lockdown was seen in the behavioral responses, significant differences between food secure and insecure

households were found in age, income, and food purchase behavior. Parameters associated with food security are age, income, food allocation, expectations on the livelihood impact and change in expenditure, and the adoption motivations in practicing backyard gardening. The stress evaluation revealed that while Filipinos tried to cope, an increased level of anxiety was experienced. The need for clear measures in terms of preparedness in any pandemic situation was heightened. These findings are significant in providing benchmark information on food security during a pandemic. **(Author's abstract)**

Keywords: *Backyard gardening, COVID-19 pandemic, Food security, Philippines, Purchase behavior, Stress evaluation, Social sciences*

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(Filipiniana Analytics)
NP

0457

The Integration of Indigenous Knowledge Systems (IKS) in the Tertiary Level Curriculum of Benguet State University La Trinidad Campus

Banes, Gigy G., Baniqued-Dela Cruz, Krist

The marginalization of indigenous cultures by western-based educational systems bawls the urgency to revitalize the Indigenous Knowledge Systems (IKS) of the Indigenous Peoples to be at par with the era of globalization. The study aimed to establish baseline data on the experiences of the faculty members of Benguet State University in the integration of IKS in the curriculum. Key Informant Interviews (KII) and Focus Group Discussions (FGDs) were used to surface information from 33 key informants from the seven colleges and two institutes of Benguet State University-La Trinidad Campus. Findings show that some faculty members employed various initiatives in integrating IKS in their teaching methodologies even prior to the issuance of CHED Memorandum No. 2, s. 2019. Specifically, the IKS integration is evident mostly in the social sciences, and community development subjects. However, various challenges encountered by the educators affect the in-depth integration of IKS in the tertiary level curriculum. The absence of explicit university policy/memorandum and monitoring scheme on the IKS integration in the curriculum, teaching methodologies, and pedagogies impede the sustainable integration of IKS in the different subjects. Coupled with other factors like limited reference materials/resources on IKS, limited knowledge, exposure, and appreciation of IKS further weaken the hope for the faculty to integrate IKS in teaching. Despite these challenges, some faculty members do in-depth integration of IKS in the subjects they are handling, as reflected in their teaching pedagogies over the years. This finding implies that in-depth IKSP integration in the curriculum is a teacherâ€™s initiative and cultural advocacy. **(Author's abstract)**

Keywords: *Indigenous Knowledge, Systems (IKS), Tertiary Curriculum, IKS Integration, Social sciences*

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2021,
(Filipiniana Analytics)
NP

0458

Knowledge Construction Schemata of Teachers in Solving Real World Non-Routine Problem Situation: Their Implications to Mathematics Education

Oryan, Ser

The study determined the performance levels in analytic geometry, physics, and statistics of students who had used Information and Communication Technology (ICT) through PowerPoint presentation (PPT) as a tool in

enhancing the teaching-learning process. The study also compared the performance levels in analytic geometry, physics, and statistics when students were grouped according to sex and according to the type of learning process used. Results of the study showed performance levels in analytic geometry, Physics, and Statistics of both males and females were satisfactory. Higher performance levels in mathematics problem solving aspect, Statistics concept, and Statistics overall were observed for students who used ICT in their learning process compared to students using the conventional method of teaching. In Physics, performance levels in the concept aspect, the problem solving aspect, and overall performance were all satisfactory regardless of the learning method used. Further research is suggested to verify the results of the study. **(Author's abstract)**

Keywords: *Knowledge construction schemata, Real-world-routine, Problem solving, Social sciences*

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2022,
(Filipiniana Analytics)
NP

0459

Motivation Toward Teaching and Employment Profile of the Bachelor of Secondary Education Graduates of Benguet State University

Dolendo, Russel B. , Bokilis, Almon B. , Alawas, Dolores E. , Cuevas, Jingle P. , Bansiong, Apler J., Parcasio, Imeld

This study determined the graduates' reasons for pursuing secondary education, employment profiles, and job-search strategies and challenges. Data were collected from 602 Bachelor of Secondary Education graduates in the AY 2013-2017 at Benguet State University. The College of Teacher Education Graduate Tracer Questionnaire (CGTQ) was used to gather data. Findings showed that about half of the respondents personally chose the degree, indicating their intrinsic motivation towards secondary school teaching. This trend was consistent across most specializations. Moreover, about 90% of the graduates traced are gainfully employed, mostly as classroom teachers (65%). Very few are unemployed (3%) and self-employed (6%). About 70% of the graduates hold non-permanent status and are employed in the private sector (about 60%). Most of the graduates are employed a year after graduation, and their mode salaries range from Php5,000.00 to Php15,000.00. Only status of employment was influenced by their level of motivation towards teaching. Many of the graduates were able to find a job through their friends or relatives. Finally, the most important hindrances encountered by the graduates in their job search are the absence of or inadequacy of experience and the lack of jobs related to their degree or field of specialization. **(Author's abstract)**

Keywords: *Graduate tracer study, Bachelor of Secondary Education, Employment profile, Motivation towards teaching, Job-search challenges, Social sciences*

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2020,
(Filipiniana Analytics)
NP

0460

Organizational culture and work engagement of municipal employees in the 5th District of Cavite

MaÃ±abo, Carlo E

The aim of this research was to determine the type of organizational culture existing in the workplace of the municipal employees in the fifth district of Cavite namely Carmona, Silang and General Mariano Alvarez, Cavite and its relationship to their work engagement of the employees. A descriptive-correlational research design was utilized in the study. 313 municipal employees from the above mentioned municipality served as the participants of the study. The study was conducted in three months period from November and December 2016 to January 2017. The data were statistically analyzed with the supervision of a statistician and with the utilization of Statistical Package for Social Sciences (SPSS) application.

The result revealed that most of the employees from the three municipalities are in the middle age of their career ranging from 26 - 33 years old and are female and married. Moreover, more than half of the total number of participants are college graduate.

In terms of the organizational culture present in the municipalities, task-oriented culture was the most dominant. Meanwhile, in terms of the level of work engagement, employees from the three municipalities were assessed as engaged.

Lastly, findings of this research revealed that there is a significant relationship between the organizational culture and the level of work engagement of the employees. Therefore, organizational culture affects the level of work engagement of the municipal employees. It appears that, based on the study, having a task culture in the municipality will direct the employees to be more engaged. **(Author's abstract)**
Keywords: *Statistical Package for Social Sciences (SPSS), Social sciences*

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0461

Perceptions on Politics and Political Participation of Benguet State University Students

Dolipas, Ma. Ther

The view of the youth about politics is a primary determinant of their political participation in school and their respective communities. This study determined the BSU political science students' perceptions of politics and examined their political participation. It used mixed methods, namely interview strategy through classroom recitation and descriptive survey with 143 students. Findings revealed that students regarded politics as a democratic form of government that is supposed to act in accordance with peoples' interests, as involving the election of famous and influential personalities, and as the primary means of solving social issues despite students associating it with negativity due to political corruption. The majority of the students were not interested in politics, and they had a negative image of politics based on how the media portrayed it. BSU students mainly engage in community politics by voting in elections and attending public meetings dealing with political or social issues. They primarily participate in school politics by attending student meetings and taking active roles in these meetings. In order to reduce political apathy among BSU students, the following actions are recommended: course facilitators of subjects that are related to politics should objectively process students' comprehension of politics, and include research (of university issues or issues that concern the locality) as a subject requirement to foster civic and political awareness; BSU Office of Student Services (OSS) should encourage all college based student organizations to hold activities that nurture civic and political engagement, and embolden active student participation in these activities, and BSU student Commission on Election (COMELEC) and BSU OSS continue partnership to promote students' political engagement. **(Author's abstract)**

Keywords: *Political perceptions, Political participation, Student political engagement, Social sciences*

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0462

Psychological contract and level of motivation of college educators in General Mariano Alvarez (GMA) and Carmona, Cavite

Conde-Francia, Maria

The study was conducted to determine the relationship between the psychological contract in terms of relational contract, transactional contract, perceived employer's commitment to the employees, and employee's commitment to the employer and the levels of motivation of college educators in General Mariano Alvarez (GMA) and Carmona, Cavite. Ninety-nine full-time college educators were randomly chosen as respondents from four colleges/universities. Findings revealed there is strong psychological contract in terms of relational contract and employees' commitment to the employer. This means a long term relationship creates trust and loyalty to the institution, which in turn commit itself to its employers that eventually affect the level of motivation of the educators. On the other hand, there is a moderate psychological contract in terms of transactional contract and the perceived employers' commitment to the employees that there is no significant relationship between these two and the level of motivation. Most educators are motivated because of intrinsic factors, such as recognition from their students, sense of accountability and responsibility, and feeling of professional growth. Extrinsic factors, on the other hand, include having camaraderie with their co-educators, associating with their students, and seeing their improvement. **(Author's abstract)**

Keywords: *Motivation, Employee commitment, Employer commitment,, Human resources, Social sciences*

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0463

Readiness of Benguet State University Pre-service Teachers in the 21st Century Teaching Environment

Parcasio, Ime

This study looked into the Benguet State University pre-service teachers' readiness in the 21st century teaching environment as evaluated by their respective Cooperating Teachers during their off-campus student teaching. It is a descriptive quantitative study conducted in Baguio and Benguet with 130 teacher-respondents from 14 Cooperating Schools of BSU College of Teacher Education. Based on the concept of eight 21st century skills, the cooperating teachers observed and evaluated the pre-service teachers as very good adaptors because of their ability to be flexible in teaching and learning at the same time; visionaries because they are open to suggestions and criticisms; collaborators because they have the skills in facilitating curricular instructions with the aid of technology, and risk takers as they accept criticisms to enhance instruction. On the other hand, the pre-service teachers need enhancements in the other skills like learning, communicating, role modeling and leading. The challenges faced by the cooperating teachers in guiding the pre-service teachers are: mentoring on ICT utilization, improvement of communication skills, lack of time for one-on-one coaching, the inability of pre-service teachers

to meet the deadline of requirements, and the missing of reminders to instructions given to them by the cooperating teachers. **(Author's abstract)**

Keywords: *Readiness, 21st Century skills, 21st Century learning environment, Social sciences*

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0464

Street Vendors' Livelihood Vulnerability to Typhoons in Naga City, Philippines

Cuesta, Michael A. , Hidalgo, Hanilyn A., Razafindrabe, Bam

Street vendors belong to the informal business sector operating outside the legal frameworks. With little or no access to social protection, they are perceived to be vulnerable to the adverse effects of a crisis or shocks like typhoons. This study assessed the livelihood vulnerability of street food vendors in an urban city in the Philippines by modifying Hahn's livelihood vulnerability model and the IPCC formula to construct a composite index for exposure, sensitivity, and adaptive capacity. Using the data obtained from the randomized survey of 100 street food vendors, principal component analysis revealed 10 latent variables related to livelihood vulnerability. These variables are business networks, business experience, human capital, financial capital, livelihood utilities, physical well-being, business risk management, physical damages, business losses, and shelter type. The index scores for each variable show that shelter type, business losses, business risk management, and financial capital are the leading factors of livelihood vulnerability among street food vendors; business network is the least. The overall vulnerability of the sector was found to be at a moderate level. One of the sector's major strengths is having social ties manifested through daily interactions and direct connections with their clients. The study offers a framework for measuring the vulnerability of the informal business sector to climate hazards that is context-specific and multifaceted, encompassing adaptive capacity, sensitivity, and exposure – distinctly integrating an entrepreneurial context indicative of business continuity as a livelihood vulnerability-reducing strategy. **(Author's abstract)**

Keywords: *Business indicators, Livelihood vulnerability, Street vendors, Typhoon, Social sciences*

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0465

Teachers' Preparedness for Inclusive Education

Sito, Leon

The Commission of Higher Education mandates all Teacher Training Institutions in the Philippines to offer a professional course on inclusive education starting school year 2018-2019. The study determined the level of preparedness of the Benguet State University Teacher Education faculty members to teach the said course. Specifically, it determined their familiarity with the principles that underpin inclusive education, skill in managing inclusive classes, and attitudes towards inclusion. Comparisons on these three main variables were made in terms of the level that they taught, years in the teaching service, and whether they had orientation on inclusive education or none. Two factors related to familiarity with inclusion principles were identified - decision-making with learners and stakeholders' active involvement. The teachers were moderately familiar with both principles but were significantly more familiar with the principles related to stakeholder's active involvement. Significant differences were observed on familiarity when involving stakeholders according to level taught and years in

service. Respondents with or without orientation on inclusive education had comparable levels of familiarity with the inclusion principles. The teachers were moderately efficacious in enhancing learning, classroom management, and establishing relationships. They had a significantly higher level of efficacy on classroom management than on enhancing learning and establishing partnerships. Significant differences were observed in the efficacy levels according to level taught and years of service but none in terms of attendance to orientation for inclusion. Two factors related to agreeing towards inclusion attitudes were identified: improvement for successful inclusion and mainstreaming. The agreement level for attitudes toward self-improvement is significantly greater than attitude toward mainstreaming in inclusive education. Significant differences in attitudes on self-improvement were found along the level taught and years in service. The findings have implications for an improved training level for both in-service and pre-service teachers, policy on all tertiary level programs, and consciousness raising about diversity to the larger society. **(Author's abstract)**

Keywords: *Inclusive Education, Familiarity, Efficacy, Attitudes, Social sciences*

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0466

Teaching Practices for Children with Autism (CWA) at Baguio SPED Center

Miguel, Da

With the increasing number of children with Autism (CWA) in the Philippines, this study looked at the teaching practices in a multi-awarded Special Education Center. It documented the CWAs' challenging behaviors, practices applied by SPED teachers in dealing with the challenging behaviors, and the effectiveness of such practices using mixed method of research. Findings show that the challenging behaviors of CWAs are aggressiveness, defiance, hyperactivity, motor deficiencies, self-stimulatory, speech deficiencies, and tantrums. The practices applied by the SPED teachers include Behavior Modification Techniques (BMTs), classroom set-ups, and schedule modifications. The study concludes that CWAs display certain types of challenging behaviour different from each other. Most of these challenging behaviors occur very often that SPED teachers have to apply various practices repeatedly. However, applying a particular practice should be based upon the cause of the behavior, the CWA's reaction, and the perceived effectiveness of the practice. This study recommends that using a certain practice for a particular type of challenging behavior, as documented in this study, be considered by other SPED Centers and regular school teachers handling inclusive education classes. Further, it recommends incorporating these practices and their appropriate application in in-service and continuing education training curriculums. **(Author's abstract)**

Keywords: *Children with Autism, Challenging Behaviors, Behavior Modification Techniques, Classroom Set-up, Schedule Modification, Social sciences*

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0467

Does the News Shape Our Views? Effects of Media Exposure on Implicit and Explicit Attitudes Toward Drug Addicts in the Philippines

Bonsol-Marasigan, Joan , Ngina, Karryl Mae C. , Bries, Francis Sim

Drug addicts as a stigmatized group became important to study due to the public sentiments, media discourses, and government actions they have stirred within the country. This research explored how information received through broadcast media (i.e. through priming) influences attitudes toward drug addicts. In this research, priming was accomplished through the exposure of the research participants to media stimuli on drug addicts. Through a 2Ã—3 mixed design experiment, participantsâ€™ perceptions of drug addicts were measured using an explicit attitude scale and implicit attitudes measurement using the Single Target-Implicit Association Test (ST-IAT). The baseline explicit and implicit attitudes were initially measured, then re-measured after each presentation of a news report about drug addicts who have either recovered from their condition or committed a heinous crime (within-subjects). Order effects on ST-IAT scores were also accounted for by counterbalancing the order of primes presented (between-subjects). Results showed that the order of prime presentation did not result in significant differences in change of attitude. Furthermore, recovery (positive) primes result in less negative to neutral but not positive attitudes, whereas criminal (negative) primes simply return participants to almost baseline negative attitudes. Therefore, although media representations can influence public attitudes toward drug addicts, such effects are nuanced and crucially dependent on the features of media information, what representations or attributes are made salient, and what domain of attitudes is being investigated **(Author's abstract)**

Keywords: *Implicit attitudes, Drug addicts, Priming, Media effects, Social sciences*

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VETERINARY MEDICINE

0468

Boar Sperm Viability, Head Morphometry, and Kinematics during Seven-day Storage in Improvised Portable Semen Shipper

PeÃ±a, Jr., Santi

Artificial insemination (AI) is pivotal in sustaining pig reproduction both in backyard and commercial production systems. With AI, boar-for-hire service boars – which are quite popular in backyard pig farming in the Philippines – do not have to be transported over long distances, thus improving efficiency, biosecurity, and productivity. One crucial aspect of a successful distance AI operation is ensuring the timely availability of fresh extended boar semen doses stored in appropriate semen cool boxes (15–18 °C) to avoid irreversible damage due to cold shock. This study was conducted to objectively determine the viability, head morphometry, and kinematic performance of boar spermatozoa during storage in [a] an improvised portable semen shipper (sSHPR) as compared to [b] standard semen refrigerator (sREF) using various extenders at different storage times. Boar semen (n = 9) was processed into 80-mL dose (~ 37.5 x 10^6 spz/mL) using four different extenders: T_0 = 0.9% NaCl solution, T_{1A} = mid-term extender A, T_{1B} = mid-term extender B, and T_2 = long-term extender, and semen quality was monitored at different intervals for up to seven days using the Sperm Class Analyzer® CASA system. Using mixed factor ANOVA, boar sperm performance generally remained relatively similar between the sREF and sSHPR ($p > 0.05$). Prolonged storage times, however, had a significant effect – particularly toward Days 5 and 7, depending on the extender used. Boar sperm in commercial extenders recorded an average of 78.45 ± 2.23% and 82.85 ± 11.39% total motility for sSHPR and sREF on Day 5, respectively. Velocity parameters (VCL, VSL, VAP) and head width also changed over time. The potential to safely store and preserve extended boar semen using an improvised portable semen shipper described in this study provides an opportunity to further explore this device as an affordable alternative storage system for extended boar semen for research or AI purposes. **(Author's abstract)**

Keywords: *Artificial insemination, ASF, Boar sperm, Kinematics, Semen shipper, Veterinary medicine*

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Molecular Characterization of *TLR4* Gene of Swamp and Riverine Type of Water Buffaloes

Gaetos, Gian Carlo S. , Venturina, Virginia M. , Fernando, Somar Israel D. , de Guia, Arren Christian M. , Medina, Noraine P., Mingala, Claro

Molecular characterization of *TLR4* genes of swamp and riverine types of water buffaloes was conducted to determine unique genotypic characteristics specific to each type of water buffalo and provide baseline information for explaining differences in disease resistance between each type. The nucleotide sequence of the riverine *TLR4* gene produced 2,526 bp, whereas the swamp TLR4 sequence produced 2,322 bp. Riverine and swamp buffalo *TLR4* nucleotide sequences were 99% similar to that of *B. bubalis* sequence from GenBank. The translated amino acid sequence of *TLR4* showed that the riverine buffalo *TLR4* sequence had a higher percentage similarity to *B. bubalis* sequence as compared to the swamp buffalo *TLR4* amino acid sequence. Phylogenetic analysis confirmed the degree of relationship between the bubaline species and showed the distinctness of each breed. The predicted functional domains identified were 13 LRRs and a single LRRCT. Transmembrane protein and globular cytoplasmic domain TIR1 were found to be conserved regions. **(Author's abstract)**

Keywords: *Globular cytoplasmic domain TIR1, LRRCT, TLR4, Transmembrane protein, Veterinary medicine*

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SUBJECT INDEX

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