

TRACK 2A – BIOLOGY AND ENVIRONMENTAL SCIENCES

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16.	Physical Characterization of Leaf Endophytic Fungi in Mangrove Plant of Bat Island, HondaBay, Palawan	Genese Divine B. Cayabo, Jhonamie M. Omar and Ma. Lotus E. Patiluna* College of Fisheries and Aquatic Sciences, Western Philippines University, Puerto Princesa City Palawan, Philippines *mlepatiluna@gmail.com
17.	Rate of Decomposition of the Leftover Food Added With Lactic Acid Bacteria Serum (Labs)	Simel Grace P. Condino*, Zarina C. Dael, and Lourd Ace May D. Tabor Philippine Science High School – Central Mindanao Campus Nangka, Balo-i, Lanao del Norte, Philippines *simelgrace.con11@gmail.com
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	Polyacrylamide Gel Electrophoresis (SDS-PAGE)	
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ABSTRACTS

ABSORPTION AND TRANSMISSION SIGNATURES OF MINE TAILINGS SEDIMENTS AND ITS EFFECT TO THE WATER TURBIDITY

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Small-scale mining is as old as Philippine history, over the years its adverse effect especially in the environment was emphasized. In this study, the effect of mine tailing sediments in the turbidity of water was studied using the absorption and transmission spectroscopy. Mine tailings were collected from abandoned gold-processing rod mills in Agusan del Sur. Only the solid parts of the samples were diluted with distilled water in different concentrations. The sample was obtained that was diluted into five concentrations. To obtain the spectrum, the iHR550 spectrometer was used with low-cost LED white light as source and samples were placed in acrylic cells. Signatures were recorded with respect to the two set-ups—first, after samples were shaken and second, letting the samples settle down after some time. The shaken up samples showed low amplitudes with much noise compared to the settled set-up. Lastly, the implication of the low transmittance and high absorbance of the mine tailing sediments were caused by high turbidity of the solution. A previous study showed consistency in results for suspended solids in water but used optical tomography as their method.

Keywords: *Absorption and Transmission Spectra, Turbidity, Mine Tailings*

ABUNDANCE, ISOLATION, CHARACTERIZATION AND SCREENING OF POTENTIAL ANTIBIOTIC-PRODUCING ACTINOMYCETES FROM LAKE LANAOSURFACE SEDIMENTS

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Discovery of new antibiotics is an important medical need in the case of development of pathogens exhibiting antibiotic resistance. In this aspect, actinomycetes from lake sediments are being explored. This study was conducted to determine the abundance of actinomycetes from the surface sediments of Lake Lanao and to screen them for antibiotic activity. Three areas along the lake were sampled using 15-meter transect lines from the shoreline to the lakeward direction. Wato-Balindong showed the highest mean abundance with 16,466 CFU/g followed by Bacolod-Kalawi with 7,555 CFU/g and Tugaya with 6,033 CFU/g. Characterization of isolated actinomycetes was done based on their colony morphology and microscopic features. A total of 34 distinct isolates were recorded (29 isolates in Wato-Balindong, 10 in Tugaya and 9 in Bacolod-Kalawi). Of the 34 actinomycete types, an isolate obtained from all sites with a code of A11, showed the highest antibiotic activity using the Cross-Streak method. Antibiotic assay revealed that out of 34 isolates, seventeen (50%) have inhibitory effects against Gram-positive *Staphylococcus aureus* and only eight (24%) isolates inhibited the growth of Gram-negative *Escherichia coli*. Two actinomycete isolates (A11 from Wato-Balindong, Tugaya and Bacolod-Kalawi and A31 from Wato-Balindong and Tugaya) showed promising antibiotic activity since their zone of inhibition were comparable with amoxicillin (positive control). Generally, isolates were found to be more effective against *S. aureus*. This study therefore concludes that Lake Lanao has potential actinomycetes that could be source of novel antibiotics. Further tests and evaluations to describe the mode of action of the promising isolates are recommended.

Keywords: *Actinomycetes, Abundance, Antibiosis, Lake Lanao, Microbial Ecology*

APPRAISAL OF THE USABILITY OF SEPILOITE MATERIAL WITH RESPECT TO RADIOMETRIC AND ELEMENTARY PROPERTIES IN ESKIŞEHİR/TURKEY

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Sepiolite is a naturally occurring clay mineral of sedimentary origin, composed of a magnesium hydrosilicate ($\text{Si}_{12}\text{O}_{30}\text{Mg}_8(\text{OH})_4(\text{H}_2\text{O})_4.8\text{H}_2\text{O}$). This mineral is widely used as animal feed additives, decolorization, herbicide carriers, cleaning-detergent, paper, paint, cosmetics, agriculture. In this work, the analysis of sepiolite specimens studied to taken from 20 different locations within the two different sepiolite mine regions in Turkey. The average sepiolites densities of Eskişehir-Beylikova (2.27gr/cm^3) and Eskişehir-Sirvihisar (2.47gr/cm^3) are collected, respectively. For radiometric analysis, each sepiolite sample in each region was measured as mean gamma dose rate ratios (DR_{out}) of 58.1 nGyh^{-1} and 53.8 nGyh^{-1} values, respectively. These values are below the world average (2.50 mSv/h) (UNSCEAR, 2008). The mean activity concentration amounts of the regions determined using the HPGe detector. It was observed that most of natural radioactive elements of the average activity concentration of ^{238}U , ^{232}Th , ^{40}K and ^{137}Cs were found 30, 5, 65 and 0.5Bq kg^{-1} , respectively. The average activity concentration of ^{238}U determined in the sepiolite samples is slightly below than the world average 33 Bq kg^{-1} . However, the average activity concentration of ^{232}Th is about 5 times lower than the world average value 45 Bqkg^{-1} . In addition, calculated outdoor gamma-ray dose rate (DR_{outc}), annual effective dose rate (E_E), lifetime cancer risk (LTCR) and external and internal hazard indexes (H_{in} , H_{out}) are below the world average values. The average values of regions D_{outm} , E_E , H_{in} , H_{out} and LTCR estimated as 19 nGyh^{-1} , $23\mu\text{Sv y}^{-1}$, 0.16nGh^{-1} , 0.1nGh^{-1} and 8.0×10^{-5} , respectively. For the elemental distributions, XRF spectrometer and XRD systems used to determine the mineralogical characterization which obtained Si, Al, Mg, Ca and K elements. A special, for all regions, 8 major oxidized elements, 14 minor and 23 trace determined compound concentrations.

Key Words: *Sepiolite, Activity Concentration, Lifetime Cancer Risk, Eskişehir*

ASSESSMENT OF ESSENTIAL ELEMENTS AND HEAVY METAL CONTENTS IN UNREFINED AND REFINED ROCK SALTS CONSUMED IN TURKEY

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While certain amounts of metals known as heavy metals are useful for organisms, however, excessive amounts can be detrimental to living organisms and can be considered as pollutants. Many of these metals are necessary for the life of the creatures and participate in the molecular and protein structures of the organisms. Salt water in seas and oceans comprises 97.6% of the water sources. In this study, the presence of heavy metal pollutants such as Cu, Fe, Zn, Pb, Hg, Co, Mn, Cr, S, Ni, V and Cd was determined as the principal index of chemical pollution in Çankırı City from July 2017 to November 2017. Samples of rock salts were obtained from Yenidoğan, Ballıbağı Village, Doğanköy, and Kayatuzu areas and brought to the laboratory for examination. Results show that the untreated and refined rock salts consumed in Turkey had basic elements and heavy metals in concentrations below the world average. Results show that elements and heavy metals were not found at a rate that could be detrimental to human health.

Keywords: *Unrefined Rock Salts, Refined Rock Salt, Radionuclide, Heavy Metal, Çankırı City, Turkey*

ASSESSMENT OF WATER QUALITY AND DETERMINATION OF MERCURY CONCENTRATION OF TALABAAN RIVER IN NAAWAN, MISAMIS ORIENTAL

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Mercury determination and the assessment of the water quality of Talabaan river in Naawan, Misamis Oriental was conducted to evaluate the post-mining condition of the water resource. Four sampling points were established including a control area to have a reference value for the portion of the river that is not affected by the tributary from the mine site. The parameters that were assessed include Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), Chloride, water pH, water temperature, Total Dissolved Solids (TDS) and Dissolved Oxygen (DO). Results of the study showed that mercury on the water resource left no trace from the extraction of gold using the heavy metal. Other parameters have also conformed to the standards set by the Department of Environment and Natural Resources (DENR) for Class A water resource or water bodies suitable as water supply which requires conventional treatment. Although, BOD has exceeded the accepted value under the Philippine national standard, the values obtained are still considered suitable for water consumption under the standards set by the World Health Organization (WHO). Holistically, the results strongly suggest that the once active mine operation in the area no longer affected the water quality of Talabaan river. It is therefore recommended to conduct soil and sediment testing on the river system to ensure that the water resource is free from the heavy metal, mercury.

Keywords: *Mercury, Talabaan River, Physico-Chemical, Water Quality, Water Assessment*

BIOACCUMULATION OF METALS IN *Polymesoda expansa* (TUWAY) FROM PUNTA BONBON, MISAMIS ORIENTAL AS A METAL POLLUTION INDICATOR

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Bioaccumulation of metals in mollusks poses a threat not only to the environment but also to human health. This research aimed to identify the concentration of arsenic, lead, and cadmium that have bio-accumulated in edible mollusks from Punta Bonbon, Misamis Oriental and to assess the effects of the various pollutants in Cagayan de Oro River. The chosen sampling site was a stream, 600 meters from the main river and abundant with *Polymesoda expansa*. This is locally known as “Tuway” and commonly consumed by humans. For the three (3) samplings, samples of the mollusks’ flesh were collected as well as the habitat sediments and were sent to FAST Laboratories for analysis. Results showed that the concentration of metals (mg) per 1,000 grams of flesh (or mg/kg), were as follows: Arsenic (As) was less than 0.5, Cadmium (Cd) was 0.03, 0.07, and 0.09, and Lead (Pb) was 0.3, 1.02, and 1.63. Lead had the highest rate of increase in concentration among the metals. Average metal pollution index (MPI) among the three samplings was approximately 0.141 for flesh, reasonably lower than the sediment (0.779). Biota-sediment accumulation factor (BSAF), which is the ratio of the concentration of metals in the flesh and sediment, showed that the *P. expansa* is a de-concentrator of As (average of 0.0404) and Pb (average of 0.141), i.e., it releases the metal back onto the sediment; and a micro-concentrator of Cd (average of 1.056), i.e., it retains some of the Cd within its flesh. Concentration of Cd never surpassed the limit for meat, but As exceeded the Provisional Tolerable Daily Intake set by FAO (2003) at 1 mg/kg during the second and third trials. Therefore, *P. expansa* was recommended to be eaten parsimoniously.

Keywords: *Bioaccumulation, Mollusks, Polymesoda expansa, Heavy Metals*

CARBON STOCK ASSESSMENT OF MANGROVE AT SITIO SUKIAT, NALIL, AND SEAGRASS BEDS AT PAHUT, AND SANGA-SANGA, BONGAO, TAWI-TAWI

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Climate change is a global phenomenon linked to the increased in amount of carbon dioxide (CO₂). Mangrove and seagrass ecosystems trap and store carbon dioxide resulting to a large carbon stock. Our study assessed the amount of carbon stored in the vegetation and sediments of mangroves and seagrass beds in Bongao, Tawi-Tawi. Initial results show that the mangrove forest consist of six (6) species, namely; *Sonneratia alba*, *Rhizophora apiculata*, *Rhizophora mucronata*, *Rhizophora stylosa*, *Ceriops decandra* and *Ceriops tagal*. *C. tagal* had the highest carbon stored (6.973 Mg/ha) while *C. decandra* had the lowest carbon stored (0.095 Mg/ha). The total carbon stock for the mangrove area is 5863.09 Mg/ha. The seagrass bed comprised of five (5) species, namely; *Cymodocea rotundata*, *Cymodocea serulata*, *Thalassia hemprichii*, *Halodule pinifolia*, *Halodule uninervis*, *Halophila decipiens*, *Halophila ovalis*, *Halophila minor* and *Enhalus acoroides*. Among these species, *H. pinifolia* was the most abundant in Sanga-Sanga with 1325.8±217.75 shoots/m² while *H. pinifolia* is the most abundant in Pahut with 523.8±25.30 shoots/m². *T. hemprichii* had the most Vegetation c-stock in both sites Pahut and Sanga-Sanga with 0.069 Mg/Ha and 0.087 Mg/Ha respectively. For the total carbon stock in two seagrass sites, Pahut has 26,039.86 Mg/Ha carbon stored while there are 23,830.88 Mg/Ha carbon stored in Sanga-Sanga.

Keywords: *Climate Change, Blue Carbon, Carbon Stock, Seagrass, Ecosystem*

DETERMINING SPATIAL AND TEMPORAL VARIATIONS OF PARTICULATE MATTER IN KUTAHYA URBAN CITY CENTER

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Air pollution is one of most important environmental problems in our times, particularly in urban areas. Its impacts affect not only the health of people, but also the quality of the living space. However, air pollution is not homogenous across the landscape; its concentration varies spatially and temporally. Knowing the conditions of air pollution across different spaces and time is a helpful health guide, particularly for people with health issues. Thus, this study aims to determine the regional and temporal changes of particulate matter, which is one of pollutant variables, in five different sites of the Kutahya urban city center. The concentration of particulate matter was observed at 6 different levels: 0.3 μm , 0.5 μm , 1.0 μm , 2.5 μm , 5.0 μm and 10.0 μm . Results revealed that a significant difference exists between factory and industrial sites and residential areas. Highest concentration of particulate matter was observed during weekends.

Keywords: *Spatial and Temporal Variation, Air quality; particulate matter, Air Pollution*

DETERMINATION OF VARIATION OF SOME HEAVY METAL CONCENTRATIONS IN *Aesculus hippocatanum* SEEDS, LEAVES, AND BRANCHES ACCORDING TO TRAFFIC DENSITY

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Heavy metals are carcinogenic and they are released into the air from industrial or traffic sources. Monitoring of heavy metal pollution is crucial to human health because exposure to these pollutions even at low concentrations poses risk since heavy metals tend to bioaccumulate. The use of plants as biomonitors, is one of the most effective methods in determining long-lasting heavy metal pollution. This research targeted to monitor the heavy metal concentrations using *Aesculus hippocatanum*. The concentrations of Ni, Cd, Zn, Fe, K, Mg and Mn were examined in seeds, leaves and branches of the plants collected from different areas of varying traffic density. Results revealed that the concentrations of heavy metals detected at different parts were statistically different at least 95% confidence level. The highest concentrations of Ni, Cd, Fe and Mn were obtained in seeds; Zn and Mg in leaf; and K in branch. It was determined that Ni, Cd and K significantly changed depending on the traffic intensity, while the rest were not statistically significant at the 95% confidence level.

Keywords: *Aesculus hippocastanum*, Heavy Metal, Organelle, Traffic, Biomonitor

EFFECTS OF THE ETHANOLIC EXTRACT OF BIGAA (*Alocasia macrorrhiza*) ON GOLDEN APPLE SNAILS (*Pomacea canaliculata*)

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Golden Apple Snail (*Pomacea canaliculata*) is one of the most invasive and destructive pests in farms. Traditional control of the prolific snails entails application of commercial molluscicides available in the market. However, snails, over time, may develop resistance to synthetic chemicals. One promising source of molluscicide is Bigaa (*Alocasia macrorrhiza*), a plant commonly found in moist areas like riversides. This study aims to determine the effects of Bigaa plant on both the Golden Apple Snail and the soil pH. A 3000-square foot plot was divided into three areas, wherein area 1 was planted with rice plants and infested with *P. Canaliculata*, area 2 was planted with rice plants and applied with snails while area 3 was infested with snails. In each area, 12 subplots were designated for each treatment, namely; Treatment 1 (30% ethanolic leaf extract of *A. macrorrhiza*), Treatment 2 (commercial molluscicide Bayluscide 700 serving as the positive control) and Treatment 3 (water as the negative control). The snails used in this study have shell diameter ranging from 1.5 cm-2.5 cm. Results revealed that T2 (commercial molluscicide) has a mean mortality rate of 88.9% and is significantly higher than that of T1 (*A. macrorrhiza* extract) with 76.6 % mortality rate at P-value=0.00328. The pH of the soil of T1 is not significantly different from that of T2 with P-value= 0.671. Therefore, the Bigaa ethanolic leaf extract is not as effective as the commercial molluscicide but is still potent to the snail considering that only crude extract was used with a lower mean pH compared to the commercial molluscicide.

Keywords: *Pomacea canaliculata*, Golden Apple Snail, *Alocasia macrorrhiza*, Molluscicide, Ph

ISOLATION, CHARACTERIZATION OF ENDOPHYTIC ACTINOMYCETES FROM THE ROOTS OF PARAGIS (*Eleusine indica*) AND SCREENING FOR ANTIBACTERIAL ACTIVITY

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Actinomycetes are of interest in research field as they are known to produce bioactive secondary metabolites which can be developed into useful pharmaceutical products. This study was conducted to isolate and characterize the endophytic actinomycetes present in the roots of Paragis (*Eleusine indica*) and to screen for their antibacterial activity against selected microorganisms, Gram-negative bacteria *Escherichia coli* and Gram-positive bacteria *Staphylococcus aureus*. Seven isolates obtained from the roots were characterized based on their colony and microscopic features. Filter Paper Disc Diffusion Method was used for antibiotic assay to measure the zone of inhibition against the test bacteria. The results showed that only one isolate exhibited antibacterial activity against *Escherichia coli* whereas all of the seven isolates demonstrated antibiosis against *Staphylococcus aureus*. Analysis of Variance showed that there was significant difference between the zones of inhibition exhibited by *E. indica* extract against the test bacteria. Duncan's Multiple Range Test revealed that the antibacterial activity of the isolates was not comparably effective as the positive control.

Keywords: *Endophytic Actinomycetes, Antibiosis, Zone of Inhibition, Filter Paper Disc Diffusion Method*

LAKE LANA O WATERS: IS IT STILL SAFE FOR DRINKING?

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Studying microbiological water quality of a lake is of primary importance especially when this body of water is used as a source of water for cooking and drinking purposes. Standard Coliform test was used to determine the most probable number of total coliforms and the presence of fecal coliforms. Results show that the water samples collected from Lake Lanao from bank up to 25 meters lakeward along Bacolod-Grande, Tamparan, Taraka, Tugaya, and Wato-Balindong, Lanao del Sur contained high coliform count ranging from an average of 148.97 to 986.80 cells per 100 ml of water during the six sampling periods from June, September, and October 2016 and until January, February, and March 2017. Positive results for both Confirmed and Completed tests imply for the presence of fecal coliforms, specifically *Escherichia coli*, an indicator bacterium of fecal contamination. Comparing the results to the standard set by the Philippine National Standards for Drinking Water (PNSDW) of coliform count below 1.1 cells per 100 ml water as safe for human consumption, no site in Lake Lanao along Bacolod-Grande, Tamparan, Taraka, Tugaya, and Wato-Balindong is potable for drinking.

Keywords: *Microbial Ecology, Water Quality, Coliform Test, Escherichia Coli, Lake Lanao*

MINING FINGERPRINTS IN TRANSPORTED SEDIMENTS ALONG CARAC-AN AND ALAMIO RIVERS WATERSHED

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Pollution of rivers and coastal waters with heavy metal containing sediments is a serious problem caused by mining. Glaring as it is, mining companies still deny that there is indeed pollution, and if ever there was, it did not come from mining. This study was conducted to ascertain the mineralogy and elements in pollutants of sediments in rivers and coastal waters in mining communities of Cantilan. Two mining pits were the object of this study. Soils, rocks, earth materials and sediments were collected from strategic sites from these pits down to the deltas in and along two rivers running by these two mining pits, all within the Cantilan watershed. Collected sediment samples were subjected to X-Ray Diffraction and Total Elemental Analysis. Soil samples were subjected to chemical analysis for cation exchange capacity nutrients content, pH were also performed. For the sediments and soil mineralogy using X-ray diffraction, coarser samples were pulverized until all grains pass a 500 μm mesh sieve, then further micronized to a grain size below 10 μm using wet grinding. These powders are then analyzed using X-ray diffraction technique. The obtained patterns (fingerprints) were then interpreted qualitatively. X-Ray diffraction results showed that sediments in rivers and deltas have minerals similar to that of minerals in pits. These minerals include pyroxene, amphibole, lizardite and smectites. Further, sediments collected were found to contain high concentration of heavy metals. Our findings show that materials downstream contain minerals (fingerprints) from the mine pits transported through Carac-an and Alamio rivers and there is an extremely high risk of heavy metal toxicity on agricultural crops due to transport of heavy metal through irrigation dams.

Keywords: *Mining, Laterite, Saprolite, Minerals, Watershed*

MOLECULAR PHYLOGENY OF CONIDAE (GASTROPODA) AT VERDE ISLAND, BATANGAS CITY, BATANGAS, PHILIPPINES USING CONCATENATED SEQUENCES OF MITOCHONDRIAL CO1 AND 16S RRNA GENE MARKERS

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The Verde Island Passage in Batangas, Philippines is known as the center of marine biodiversity and is perceived to have the highest concentration of marine biodiversity in the world. Given its diversity, this presents an opportunity for discovering an economically and pharmacologically important *Conus* species of which a record on the available and remaining *Conus* species in the area is needed in building data on the regional collection of this group. To gather accurate data, forty- five (45) samples were collected along the intertidal zones of all barangays at Verde island and initially separated by phenotype. Identification using mitochondrial gene markers 16S rRNA and COI were employed. Their DNA was extracted and the mitochondrial CO1 and 16S gene markers were amplified using Polymerase Chain Reaction using specific primers. Sequences were assembled and subjected to NCBI BLAST for identification. To generate a comprehensive phylogenetic analysis of the samples, concatenated sequences of the two genes were used for analysis. Molecular phylogeny was generated using Neighbor Joining, Maximum Parsimony and Maximum Likelihood Methods. Twenty-one (21) distinct species were identified using the gene markers. Phylogenetic analysis of both gene markers of majority of the samples revealed consistency with the molecular phylogeny of *Conus* species. Tree topologies in both COI and 16S rRNA were essentially similar. Most species formed well-defined lineages and consistent clades with robust statistical supports.

Keywords: *Molecular phylogeny; Gene Markers; 16s rRNA, cytochrome oxidase 1*

MONITORING *Chrysaora hysoscella* (CNIDARIA, SCYPHOZOA) IN THE BELGIAN PART OF THE NORTH SEA USING EDNA

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The use of Environmental DNA (eDNA) in monitoring ecosystems is now gaining attention in the field of research. Recent studies have demonstrated that the distribution and biomass of aquatic organisms can be estimated through detection and quantification of eDNA samples in the studied ecosystem. This study used eDNA approach to detect the compass jellyfish (*Chrysaora hysoscella*) in the southern North Sea. eDNA samples were collected from the surface water of the nine studied stations in the Belgian part of the North Sea (BPNS) from 2014 to 2016 and were extracted using cetyltrimethyl ammonium bromide (CTAB). eDNA extracts were run in a qPCR for *C. hysoscella* eDNA detection and quantification. This study detected *C. hysoscella* eDNA in the BPNS across the sampling months with a reduction in the frequency of detection in 2016. The target eDNA was found to be more common in Oostende then in Nieuwpoort and least in Zeebrugge stations. *C. hysoscella* eDNA was common and abundant in offshore stations and least in the shoreline stations. Peaks of eDNA abundance were recorded in spring, summer and autumn periods. The results also revealed that the abundance of *C. hysoscella* eDNA somehow exhibited temporal and spatial variations. This study confirms the broad potential of eDNA method in surveying ecosystems. The eDNA protocol used in the present study can be developed further to monitor jellyfish population in the BPNS obtaining a more detailed estimates of jellyfish abundance and distribution.

Keywords: eDNA, *Chrysaora hysoscella*, Jelly Fish, North Sea, qPCR

PHYSICAL CHARACTERIZATION OF LEAF ENDOPHYTIC FUNGI IN MANGROVE PLANTS OF BAT ISLAND, HONDA BAY, PALAWAN

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Endophytic fungi are endosymbiont microbes that colonize living tissues of plants. They represent an unexplored source of novel compounds and have the capacity to produce a diverse class of plant secondary metabolites. However, endophytic fungi from the mangrove forest are poorly investigated. Thus, this study isolated and characterized the leaf endophytic fungi from the mangrove forest in Bat Island, Honda Bay, Puerto Princesa, Palawan. A total of 25 endophytic fungi were isolated and characterized from eight mangrove plants; *Aegiceras floridum*, *Avicennia marina*, *Bruguiera gymnorrhiza*, *Ceriops decandra*, *Lumnitzera racemosa*, *Rhizophora apiculata*, *R. mucronata* and *Sonneratia alba*. Among the 8 mangrove species, *Sonneratia alba* and *B. gymnorrhiza* have the highest number of endophytic fungi. Most of the isolated fungi were slow growing. The most common physical characteristics that endophytic fungi colonies showed were the following; rhizoid (form), crateriform (elevation), filiform (margin), wrinkled (surface), translucent (opacity), white (color) and septate hyphae. Other characteristics were also observed such as greenish and creamy white color and some fungi grew inside the agar which called anaerobic. Also, there were some fungi whose hyphae were submerged into the agar. Yeasts were also observed from *B. gymnorrhiza*, *L. racemosa*, *R. apiculata* and *S. alba*. Yeasts are known to accumulate a variety of carotenoids, a group of molecules valuable for the pharmaceutical, chemical, food and feed industries; they can act as vitamin A precursors; and they have antioxidant properties and possible tumour-inhibiting activity. The identification of isolated endophytic fungi and testing their biotechnological potential is significant for possible drug development.

Keywords: *Endophytic Fungi, Yeasts, Carotenoids, Endosymbiont, Hyphae*

RATE OF DECOMPOSITION OF THE LEFTOVER FOOD ADDED WITH LACTIC ACID BACTERIA SERUM (LABS)

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Majority of the accumulated municipal solid waste in the Philippines are biodegradables, which are mostly food wastes. A way of utilizing food wastes is by compost-making. However, people are easily discouraged by this method because it takes time, requires space, and poses health hazards. There is evidence showing that adding effective microorganisms (EM) such as lactic acid bacteria to a decomposed garbage can remove its foul smell and cause faster decomposition rate, enriched nutrients, and increased microbial activities. The researchers decided to compare the rate of decomposition of leftover food added with lactic acid bacteria serum and without (control). This study aims to encourage households in composting by providing an easy and convenient method. Within the period of 29 days of experimentation and regulation, it was observed that the foul smell of the leftover foods started disappearing gradually from the tenth day. Only the control set-up showed continuous growth of worms despite both set-ups being infested. At the end of the experimentation period, it can be inferred that the treated set-up had a slower decomposition rate than the control set-up.

Keywords: *Effective Microorganisms, Lactic Acid, Lactic Acid Bacteria Serum, Leftover food, Rate of Decomposition*

RELATIVE PROTEIN PROFILE OF PHILIPPINE CINNAMOMUM (SCHAEFFER) USING SDS-PAGE

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Philippine *Cinnamomum* are trees with aromatic leaves and bark. It has several economic and medicinal uses, but concerns on protein profile are limited. Thus, this study was conducted to determine the relative protein profile of the species by Sodium Dodecyl Sulfate-Polyacrylamide Gel Electrophoresis (SDS-PAGE). A total of 27 cinnamon trees were sampled, proteins were extracted from leaves and run in SDS-Page with LSB (Laemli Sample Buffer) and Tris HCl (1:1) as sample buffer. Results showed that the leaf samples had the same protein profile although the intensity of the same bands varied. Pronounced protein bands were observed corresponding to 50 to 75 kDa and 25 kDa, with additional minor bands. The results in SDS-PAGE showed that the component proteins of *Cinnamomum* leaves were comparable regardless of geographical source and different stages of growth of the samples. However, the concentration of some component proteins may vary as indicated by difference in intensity of protein bands. Based from the results of the study, Philippine *Cinnamomum* has higher protein content that can be used for culinary, medicinal and pharmaceuticals.

Keywords: *Philippine Cinnamomum, Schaeffer, Relative Protein Profile, SDS-PAGE*