

# 3<sup>rd</sup> International Conference on Ecology, Ecosystem and Conservation Biology

## 3<sup>rd</sup> International Conference on & Microbial Ecology & Eco Systems

March 18-19, 2019 | Chicago, USA

POSTERS PRESENTATIONS | DAY 2

JOURNAL OF ECOSYSTEM & ECOGRAPHY 2019, VOLUME 9 | DOI:10.4172/2157-7625-C1-045

### Analysis of the microbiota changes in the intensive care unit with routine cleaning

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University of Sao Paulo, Brazil

Hospital-associated infections in intensive care units (ICUs) can be difficult to treat and cause high mortality rates. Organisms causing these infections could be present at supplies and equipment around the patient. The disinfection and sterilization of these surfaces near the patient are generally done by concurrent cleaning. Culture-dependent methods are used to study bacterial populations

in the routine analysis to evaluate cleaning efficiency. However, these methods can underrate the microbiome diversity present in hospital areas. Therefore, with the aim of investigating the efficiency of cleaning within a referral hospital's ICU, a 16S rRNA metagenomic sequencing approach was used to profile bacterial surface communities before and after concurrent cleaning with polyhexamethylene biguanide (PHMB) solution. The results showed that, although some bacterial populations decreased, potential human pathogens were still present after cleaning the surfaces, demonstrating that these ICU surfaces represent a potential vector for spreading

pathogens. These results highlight the importance of evaluating routine cleaning as a mean of managing the microbial ecosystem of ICUs and using deep-sequencing tools for microbial surveillance and hygienic testing in hospital environments.

#### Biography

Lucas F Ribeiro has completed his PhD at the age of 30 years from the University of Sao Paulo and Postdoctoral studies from Johns Hopkins University. Currently, he works as a Postdoctoral Fellow at the University of Sao Paulo. He has published 20 papers in reputed journals and has been serving as a guest editorial board member of repute.

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### Removal of Cu<sup>2+</sup> ions from aqueous solutions by combined methods

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University of Prishtina, Albania

This paper aims to investigate the removal of copper ions from aqueous solutions using combined methods; the adsorption Cu<sup>2+</sup> ions onto natural clay as a low-cost adsorbent and reverse osmosis method. During experimentation batch technique is applied and equilibrium adsorption parameters, [Q<sub>m</sub>=95.24(mg/g) and b=0.0032(L/mg), K<sub>f</sub>= 1.91(mg/g) and n=1.21(L/mg)], were found using the Langmuir and Freundlich isotherms. The results fit better

with the Freundlich isotherm. Regarding the adsorption kinetics, pseudo first order and pseudo-second-order models are examined and it is found that the adsorption of copper ions onto natural clay nature obeys pseudo-second order. Heterogeneous asymmetric reverse osmosis membranes made from a blend of cellulose acetate, powdered coal and powdered bentonite prepared from the composition of casting solvent have been studied in the relatively low pressure 17.63x10<sup>5</sup>Pa. The analysis and conclusions reached in this work show that heterogeneous asymmetric reverse osmosis membranes have better properties compared to asymmetric cellulose acetate membranes.

### Biography

Makfire Sadiku-Hasani is an Assistant Professor in the Department of Chemistry at the University of Prishtina. From 1997 to 2013 she worked as a teaching assistant. She was promoted to Assistant Professor in 2013. She received her B.S. and M.S. from the University of Prishtina. She received her Ph.D. in the field of Superficial Phenomena from the University of Tirana in 2012. Recently her research has focused on the practical use of clay for the adsorption of various contaminants from different mediums and the use of clay as an addition to the formation of heterogeneous reverse osmosis membranes.

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### Assessing carbon pools of three indigenous agroforestry systems of south eastern rift valley landscapes, Ethiopia

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Increasing the size of the global terrestrial sink is one strategy for mitigation of CO<sub>2</sub> concentration in the atmosphere. The most significant increases in C storage can be achieved by moving from lower biomass land-use systems to tree-based systems like agroforestry systems. Reports indicated that 1.1–2.2x10<sup>9</sup> t C could be removed from the atmosphere over the next 50 years if agroforestry systems are implemented on a global scale. However, estimation of carbon stocks in indigenous agroforestry systems of South-eastern Rift-valley landscapes, Ethiopia remains unexplored. Therefore, the study was aimed to investigate above

ground and below ground biomass, below ground and above ground biomass carbon, soil organic carbon and total carbon stock of three indigenous agroforestry systems namely (Enset based, Enset-coffee based and Coffee-Fruit tree-Enset based). The study was conducted in three selected sites of Dilla zuria district of Gedeo zone. For each agroforestry system, 20 farms (total of 60) representative of each agroforestry system was randomly selected and inventoried. Different allometric equations were used for estimation and data was analyzed by IBM SPSS version 22 (SPSS Inc. 2010). The mean average agroforestry C stock (biomass C, litter plus SOC up to 40cm depth) was the highest for the Coffee–Fruit tree-Enset based agroforestry system (237 t C ha<sup>-1</sup>) and the lowest for the Enset (187 C ha<sup>-1</sup>) system. Biomass (above and belowground) C stocks were also highest for the Coffee–Fruit tree-Enset based agroforestry (140.5±54 t C

ha-1) and followed by Enset based agroforestry system (40.1±9.6 t C ha<sup>-1</sup>) and Enset (49 ±44). The two-tailed t-test at the significance level of α=0.05 showed, there are significant differences among the agroforestry systems. Indigenous agroforestry systems will have a great contribution to mitigating climate change through carbon sequestration.

#### Biography

Hafta Mebrahten Tesfay got his bachelor's degree in Natural Resource Management (2006) from Hawassa University, Ethiopia. After graduation he served as soil and water conservation expert and later as head of land use administration and environmental protection of a district in Ethiopia. Now he is a Ph.D. student at BOKU University of Natural Resources and Life Sciences, Vienna, Austria. He has three publications and they are published as monographs, book of abstracts and poster presentations.

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### Short term effects of polystyrene plastic on *Aiptasia pallida*

Natasha D Sawickij

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This study focuses on the effects of polystyrene plastic (PS) on the anemone *Aiptasia pallida*. PS plastic is commonly used worldwide and is found in a wide variety of products. Some of these include plastic used in food services, packaging for shipping, as well as for many medical uses such as tissue culture trays. Due to the increasing amount of plastic produced, much of it is ending up in our oceans. It is estimated that there are at least 12.7 million metric tons of plastics being released into our oceans each year. This study looks at the short term effects plastic consumption has on *Aiptasia pallida*, specifically overall short term

health effects. Examples of effects are weight and tentacle area, the retention time of plastic throughout a twelve day study, and the anemones' ability to extract heavy metals out of the plastic. A total of ten anemones were exposed to plastic for twelve-days, then kept at 20°C and then kept at 25°C. It was found that there was no statistical difference between retention time of plastics or the different temperature treatments (P-value 0.2048). It was found that during the experiment, the overall anemone weight decreased, resulting in a statistical difference between day one and day twelve of both treatments (P-value 0.001 and 0.005 respectively). It was also found that throughout the experiment the average tentacle area decreased for both treatment types, however, 20°C was not statistically significant with a

P-value of 0.09 while 25°C was statistically significant with a P-value of 0.0001. Overall it was found that anemones kept at different temperatures did not show any preference for consuming plastics, while overall health decreased in both cases due to plastic exposure.

#### Biography

Natasha Sawickij is a recent graduate of Florida Southern College, attaining a BS in Marine biology. She has previous research experience at the Duke Marine Lab in Beaufort NC, under the supervision of Dr. Daniel Rittschof. During her senior year at Florida Southern College, Lakeland FL, she was able to complete a study on the Short-term effects plastics have on the anemones *Aiptasia Pallida*. She hopes to attend graduate school this coming fall.

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### A study of Avian biodiversity changes after habitat restoration – A novel approach using remote sensing and ebird observation data

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<sup>3</sup>Clean Water Services, Forest Grove, USA

During the last two centuries, the contiguous United States has lost over half of its wetland habitats. Restoration of wetland habitats is critical for improving the health and diversity of wildlife populations. Fernhill Wetlands in Forest Grove, Oregon is a natural wastewater treatment site that was transformed from unused wastewater ponds to a complex natural wetland habitat in 2014-15. This study aimed to assess the avian biodiversity change after habitat restoration at Fernhill Wetlands by developing a novel and reusable technique combining

remote sensing satellite imagery and geospatial climate data and performing quantitative correlations to community science bird observation data. LANDSAT-8 and SENTINEL-2 satellite imagery and PRISM climate data were processed in the cloud using Google Earth Engine and vegetation, water and climate indices for pre- and post-restoration periods were calculated. Quantitative correlations were then established in R between these indices and bird observation data from the Cornell University's eBird database. Finally, supervised classification was used to obtain clarity on land, vegetation and water changes in the region of interest. Several terrestrial and deep-water species correlated well with vegetation and water indices. Shorebirds, marsh birds and others at the water's edge showed subtler and sometimes unexpected reactions to habitat change. The technique also revealed differences not seen in conventional analyses such as the response of dabbling ducks. A powerful methodology was developed to study the impact

of habitat restoration on Avian populations combining remote sensing and bird observation data. It showed that the habitat restoration had a positive impact on several species, while also revealing interesting and unexpected effects on others. It is expected that the technique will be very useful for ongoing habitat management by wetland managers.

#### Biography

Ashwin Sivakumar is a student at Flintridge Preparatory School in La Canada-Flintridge, CA. He has been an active birder since childhood and is extremely interested in ornithology, ecology, conservation, and evolutionary biology. Having lived on the Pacific Flyway of North America, he has always been interested in observing the birds as they migrate and has had the joy of participating in pelagic trips off the coast of Oregon to observe albatrosses and jaegers. A few years ago, he traveled with his family to the Osa Peninsula in Costa Rica and added more than 100 species to his life bird list.

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## Rapid changes and loss of freshwater springs and fish communities of the Arabian Peninsula

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During summer 2018, 132 springs from Saudi Arabia, Oman and Jordan were surveyed for water chemistry and fish communities. Although most springs in Oman are reasonably intact, only 14 of 46 springs flowing in Saudi Arabia in 1990 exist, and all springs visited in Jordan were heavily polluted from direct human contact. In addition, the electrical conductivity of the remaining

Saudi springs has increased profoundly during this period. Fish were sampled at each spring boil, if present, using a dip net, identified to species, photographed and returned to the location where collected. Five native species were found in the springs of Saudi Arabia and Oman, but all springs in Jordan lacked fish. In addition, two introduced Tilapia species were found in some Oman springs. Garra tibanica was found only in Saudi Arabian springs, while Cyprinion watsoni was restricted to a single spring in Oman. The general distributions of species in the Arabian Peninsula were compared with earlier surveys, and the relationship of each species to electrical conductivity was analyzed to assess whether increased

conductivity levels in springs since 1990 as a result of over pumping of groundwater has or will have an impact on fish tolerance and distribution. Aphanius dispar is limited to low conductivity springs, Cyprinion mhalensis and Gara tibanica to low-moderately high conductivity, while Garra tibanica can tolerate extremely high conductivity. Continued over extraction of groundwater will lead to loss of additional springs and the likely extirpation of species due to increased conductivity. This is a major conservation issue facing the Arabian Peninsula.

### Biography

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### Comparative structural and functional analysis of microbial diversity and physico chemical analysis of the Okhla landfill and compost soil New Delhi India

Bindu Yadav and Meenakshi Dua  
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Metagenomics provides a culture-independent assessment and gives an insight into complex relationships between microbial composition and functional diversity in soil. Landfill and compost sites provide unique habitat to study microbial interrelationships since they host a great microbial diversity. We report the taxonomic and functional characterization of the microbiome of composite soil sample isolated from typical landfill and compost in Okhla, New Delhi, India. Whole metagenome

sequencing was performed to identify the microbial community of the composite soil sample using the Illumina NextSeq500 platform. Prodigal was performed for the gene prediction and resulting genes were considered for downstream analysis. The taxonomical analysis was carried out using Kaiju. The high-quality reads were assembled using CLC genomics workbench. Analysis showed that *Methylocaldum*, *Thalassobacillus*, *Acinetobacter* were the most dominant genera where-as Proteobacteria, Acinetobacter, Firmicutes were the most dominant phyla in Landfill. Likewise, Streptomyces, Saccharomonospora, Nocardiosis the most dominant genera whereas Actinobacteria, Proteobacteria, Firmicutes were the most dominant phyla in compost. This suggests the key role these microbes play in biomass degradation.

The structure of microbiota in the landfill was affected by physicochemical properties like pH, EC, organic matter and moisture content and presence of various elements. Physicochemical analysis of various elements was done with ED-XRF. Our results provide applicable analysis and visualization approaches for studying the complexity and heterogeneity of soil microbial communities. For functional analysis COG, KEGG pathways and GO was performed using Cognizer. The COG class 'R' was found to have the highest number of hits for the composite sample. This showed that most of the genes were involved in "Metabolism" of carbohydrates, amino acids, energy, nucleotides and lipids, xenobiotics biodegradation. In our study, a significant decrease in *Candidatus Saccharibacteria* was observed in the presence of *P. Indica*, a plant endomycorrhiza. Further investigations are in process to

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study the interaction between the prokaryote bacteria and the eukaryote fungus.

### **Biography**

Bindu is pursuing PhD from School of Environmental Sciences, Jawaharlal Nehru University, New Delhi, India under supervision of Dr. Meenakshi Dua. She has enrolled in PhD in Microbial Ecology in 2016. She has

completed her graduation in 2014 from Gargi College, University of Delhi, New Delhi, India and post graduation in 2016 from Banasthali University, Rajasthan, India. Recently she attended International Conference on Microbiome Research (ICMR) which was held in Hyatt Regency Pune, India from 19-22 Nov 2018. She

participated in The Science Communication & Career Workshop Organized by The Wellcome Trust/DBT India Alliance and Nature India on 17 April 2018 at Jawaharlal Nehru University, New Delhi, India. She has publications in Mycopath and The Scientific Temper in 2016.

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## Climate change land cover/use and vegetation evolution in the upper Huai river basin

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Land use/land cover and vegetation in upper Huai river basin are considered to be highly susceptible to climate change. However, there is less indication of the change trends in both climate and land cover/land use in the study basin. Thus less understanding of the watershed sensitivity and

adaptability to climate change. Here we identified the spatial and temporal patterns of changes in climate (from 1960 to 2016), land cover/land use and vegetation (from 2000 to 2014) in the upper Huai river basin using land using the Mann-Kendall test estimator, land use transfer-matrix and NDVI for the four-year time interval. During the past 56 years, there was a slightly decreasing trend in precipitation while air temperature has increased by 1.2°C. During the past 15 years, land cover has changed significantly. Herein residence construction land, artificial water and, artificial

vegetation with a discrete distribution, increased and wetland and artificial water bodies showed a diminishing trend in the study period. On the other hand, natural vegetation coverage does not show obvious changes. Land use/cover change impact was gradually increased by human intervention on various land use types Our findings have implications for predicting the safety of water resources and water eco-environment in the Huai river basin under global change.

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### Serodiagnosis of human herpesvirus 8 in women with breast cancer

Dania Mudar Shakir  
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Human herpesvirus 8 (HHV-8) is a common virus in the Mediterranean region. It has been linked to a number of malignancies, and it is believed to be the causative agent in certain cases. The aim of this study was to evaluate the distribution and possible association between HHV-8 and breast carcinoma, and to assess the risk factors associated with an HHV-8 infection. A total of 90 blood samples were collected. Forty-five of these patients were recently diagnosed with breast cancer and presented at the Oncology Centre in Basra, with ages ranging from 28 to 68 years old. Forty-five apparently

healthy females made up the control group, with ages ranging from 25 to 70 years old. The HHV-8 immunoglobulin G (IgG) antibody detection was done using an ELISA with previously stored sera. HHV-8 was detected in 31.1% of the women with breast cancer, and a statistically significant difference was determined. The highest HHV-8 seropositivity (17.8%) was seen in the 51–60 years old age group, and significant differences were found between the patient and control groups with regard to the different age groups. Invasive ductal carcinoma was the most common type of breast malignancy in the women, with the majority of the patients classified as stage II. The histopathological types had a significant effect on the outcome proportion of the HHV-8 IgG antibodies. Fourteen of breast cancer patients with blood transfusion

histories, 6.7% were HHV-8 IgG antibody positive, indicating a significant difference. Diabetes mellitus was determined to be one risk factor associated with a high seropositivity of HHV-8, it occurred at a rate of 13.3% among women with breast cancer ( $p < 0.05$ ). In addition, the sexual route may be a significant risk factor. However, the HHV-8 infected breast cancer patients showed no statistically significant association with the coexistence of breast cancer markers. Based on the results of this study, female breast cancer may be associated with HHV-8. A blood transfusion, diabetes mellitus and marriage were found to be risk factors for acquired HHV-8 infections in breast cancer patients.

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**Abundance and community structure of ammonium monooxygenase (*amoA*) genes in Liaohe estuary sediments**

Hongxia Ming, Jingfeng Fan and Quanrui Chen  
 National Marine Environmental Monitoring Center, China

Ammonia oxidation is an important part of the global nitrogen cycle. Ammonia-oxidizing archaea (AOA) and ammonia-oxidizing bacteria (AOB) are important players in the ammonia oxidation process. In this study, 13 sediment samples from the Liaohe

estuary were collected. The abundances of 16S rRNA and *amoA* genes were detected by real-time fluorescence quantitative PCR. The diversity and community structure of AOA and AOB were investigated by constructing clone libraries. Quantitative PCR results showed that the 16S rRNA gene abundances of archaea and bacteria were  $1.05 \times 10^8 \sim 1.31 \times 10^9$  and  $3.05 \times 10^{10} \sim 1.37 \times 10^{12}$  copies/g wet sediment, respectively. The AOA and AOB *amoA* gene abundances ranged from  $3.10 \times 10^6 \sim 2.85 \times 10^7$  and  $6.59 \times 10^5$  to  $1.20 \times 10^7$  copies/g wet deposit, respectively. At all sites, AOA abundance

was greater than AOB. Phylogenetic analysis showed that the AOA *amoA* sequences were mainly Nitrososphaera and Nitrosopumilus, and the AOB *amoA* sequences were mainly located in estuarine sediments and wetland soils. In addition, canonical correspondence analysis showed that the environmental factors affecting AOA community distribution were salinity, pH, ammonia ( $\text{NH}_4^+$ ), conductivity, total phosphorus, sand, and silt content, while the sand and silt content had a significant effect on AOB community structure.

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## **Spatial distribution characteristics of bacterial community structure and gene abundance in sediments of the Bohai Sea**

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 National Marine Environmental  
 Monitoring Center, China

This study investigated differences in the community structure and environmental responses of the bacterial community in sediments of the Bohai Sea. Illumina high-throughput sequencing technology and real-time PCR were used to assay the bacterial 16S rDNA in the surface sediments of 13 sampling stations in

the Bohai Sea. The results showed that heavy metal pollution showed regional characteristics, most of the sediments were contaminated by Hg, and the 16S rDNA abundance of bacteria appeared low in the northern regional station. The main phyla of bacteria recorded included Proteobacteria (52.92%), *Bacteroidetes* (11.76%), *Planctomycetes* (7.39%) and Acidobacteria (6.53%). The genus with the highest relative abundance was *Desulfobulbus* (4.99%), which was the dominant genus at most sampling stations. The main factors influencing bacterial community structure were total organic carbon, followed by the depth and total phosphorus. The

content of lead, cadmium, chromium, copper, and zinc had a consistent effect on community structure. Arsenic showed a negative correlation with bacterial community structure in most samples, while the more polluted mercury and chromium in sediments had no significant effect on bacterial community structure. The bacterial community in sediment samples from the Bohai Sea was rich in diversity and displayed an increase in diversity from high to low latitudes. The data indicated that the Bohai Sea had abundant microbial resources and was rich in bacteria with the potential to metabolize many types of pollutants.

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## Emergence of dark septate endophytic fungi in microbial world

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 Periyar University, India

**D**ark septate endophytic (DSE) fungi are diverse facultative ascomycetes found inside the root tissues without any pathogenicity to the host. Like arbuscular mycorrhizal fungi, DSE has predominant positive ecological roles in plants. The DSE fungal associations exhibit positive effects on plant growth, water, and nutrient uptake especially, the least available nutrient, phosphorus (P). Phytohormones secretion by the DSE adds up in the crop improvement.

Nevertheless, the presence of melanin in DSE has a wide range of photoprotection and antioxidant properties which could scavenge free radicals under stress condition. Four DSE fungi, *Curvularia geniculata* RSL06, *Phoma multirostrata* RSL03, *P. multirostrata* RSL04 and *Eurotiomyces* sp. RSL05 were isolated from roots of different plants exposed to light stress such as UV and a different wavelength of lights. The pH of the broth, biomass, amylase enzyme and specific activity, and their melanin production were significantly varied among the fungal isolates and light conditions. The FTIR spectroscopic analysis of melanin in all DSE showed distinct variation

in the functional groups. Further, the higher radical scavenging activity of melanin was recorded in *C. geniculata* exhibited 29.65%-51.94% in UV and 10.52%-39.38% in the wavelength of light. Previously, we proved *C. geniculata* improved plant growth through phosphate solubilization and phytohormone production. Hence, this study suggested that fungal melanin acts as a potential agent against various light stress and contains antioxidant activity, which extends our knowledge to analyze the activity of DSE fungi under molecular level. In the future, DSE fungi could replace the usage of chemical fertilizers in agriculture.

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### An econometric study of the impact of foreign direct investment and energy consumption on the environment of China

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The massive economic growth in China in recent years has generated into an upsurge in demand for energy and a tumultuous rise in carbon dioxide emissions. Yet, precise estimation of economic and energy impact of environmental pollution remains at the edge of extant studies. Though several scholars have struggled to reveal the main factors accounting for environmental degradation; most these studies utilized common econometric models such as

vector auto regression and aggregate the variables, which for the most part prompts however contradictory and mixed results. Thus, there is an exigent need for precise study of the economic and energy efficiency of environmental degradation whilst applying strong econometric models and disaggregating the variables into its separate individual variables to explicate their respective effects on the environment. This help to provide robust results and advances the debate for better policy formulation and guidelines to mitigate carbon dioxide emissions especially in China. This study, therefore, seeks to examine the causal effect of Foreign Direct Investment and energy consumption on the environment of China using a robust and recent econometric approach such as Dynamic Ordinary Least Squares (DOLS) and bootstrapped Granger

causality. Our study impanels and tests an ensemble of a group of vital variables predominant in recent studies on environment-energy-economic causality: economic growth, energy consumption, Foreign Direct Investment, international trade, and carbon dioxide emission. Our study further disaggregated energy consumption by their sources to identify their respective influence on the environment. Our results showed that the Dynamic Ordinary Least Squares method provide accurate statistical inference regarding the direction of the causality among the variables than the conventional method such as OLS and Granger Causality predominantly used in the literature as it is more robust and provide accurate critical values.

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**Impacts of anthropogenic activities on physicochemical composition in Awba Dam University of Ibadan Southwest Nigeria**

**KF Farinloye**

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**A**wba dam (AwD) is a reservoir of recreational potentials in Ibadan, Nigeria. The dam was dredged for the sake of ecotourism development in 2013, hence there could be tendencies for dredging; an anthropogenic activity to impact the reservoir, hence effects of anthropogenic activities on the present physicochemical

characteristics of the dam site was assessed. A reconnaissance study was carried out around AwD to make a general assessment. This gave the description of the habitat. The physicochemical parameters of AwD including water and air temperatures, transparency, total dissolved solids [TDS] dissolved oxygen [DO] etc was investigated. Bird survey was carried out using the line transect method. Stratified random sampling was used to allocate 7 transects into within the dam site. Data obtained were analyzed using descriptive and inferential statistics. Values of physicochemical parameters of the dam observed ranged as follows:

water temperature, 24-26°C, transparency 0.0-0.3m, TDS 143.2-151.5mg/L, conductivity, 289.2-391.5µmhos/cm respectively. The mean rainfall for 2013-2015 was 1550mm, while mean air temperature was at 22-23°C respectively. Zn was (-0.641), Cu was (0.788) while Fe was (0.797) respectively. The AwD had no worker/staff as at the time of documenting the findings. Dredging has taken a heavy negative toll on the physicochemical parameters of the reservoir. Environmental Impact Assessment (EIA) is highly necessary if such massive habitat change will be required later in the future to forestall a drastic change in physicochemical composition.

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**Ecology, Ecosystem and Conservation Biology**

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ACCEPTED ABSTRACTS

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**Inactivation of a  
 proteorhodopsin  
 like gene in  
*Aurantiochytrium* by  
 double homologous  
 recombination**

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*Aurantiochytrium limacinum*, a marine heterotroph which belongs to a crude oil-degrading class of protists called the Labyrinthulomycetes, is one of a variety of thraustochytrids known to produce zoospores that respond to chemical cues, as well as light, but the mechanisms by which they do so are unknown. While many papers have been published concerning how zoospores across different taxa respond

to light, little research has been done in investigating the mechanism of light sensitivity of *Aurantiochytrium limacinum*, which plays an important role in the carbon cycle by decomposing crude oil, tarballs, and other non-living organic matter. Since rhodopsins can be involved in phototaxis, we hypothesized that the gene 7690 in *Aurantiochytrium*, which encodes a protein with similarity to rhodopsins, serves as a photoreceptor for zoospore phototaxis. By attempting to knock out the 7690 genes through double homologous recombination, this research aimed to determine whether the 7690 protein is required for phototaxis of the zoospores. We extracted, purified and restriction digested a plasmid

containing the antibiotic resistance cassette we call 'GZG' (made of promoter and terminator regions of the *Aurantiochytrium* GAPDH gene surrounding, and driving the expression of, the sh ble gene, which encodes resistance to zeocin) in between DNA from upstream and downstream of the 7690 genes, and introduced that whole construct into *Aurantiochytrium* by electroporation. After testing 6 different isolates using colony PCR to search for double homologous recombinants, we identified a singular potential knockout which can be useful in investigating whether the 7690 genes is required for phototaxis.

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## **Socioeconomic impact of capture and sale of *Sylla serrata* in Metuge community**

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The mangrove crabs *Sylla serrata* are very important for the livelihood of coastal communities particularly in Metuge District, South of Cabo Delgado Province, where the study was conducted from June to August 2014. The aim of this study is to estimate the socioeconomic impact of mangrove crabs captures in communities of Metuge

district. Data were collected in the landing sites in the village and in local crab markets. In total 26 crabs, fishermen and 6 traders were surveyed it was found that activity of capture mangrove Crabs is practiced 100% by man. Their ages ranged from 15 to 68 years old and the range 35-60-year-old was dominant. To capture the mangrove crabs the fishermen use a long hook iron with 1.5 to 2 meters, they goes 5-7 times per week and spend about 5-8hours a day in mangrove forests, the quantities captured by fishermen can vary from 2 to 20kg per day, the price

of crabs depend on where fishermen sell, in village one kilogram cost 1 to 1.5USD and 3USD for local traders. On the other hand, the traders can sell until 50kg of crabs along the road and specific places in Pemba city. The incomes vary from 11 to 174USD per month. The money is intended to purchase food and agricultural instruments. 90% of interviewed dropout the school, high number of family members, poor housing made by local materials, and relies on community wells to access water and most do not have electric power.

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### Evolution of contamination features and health risk of potentially toxic metals in dust from selected schools in Shiraz megacity, SW Iran

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The concentrations of eight potentially toxic metals (i.e., As, Co, Cr, Cu, Cd, Ni, Pb, and Zn) and their contamination levels in dust collected from some schools of Shiraz city, Iran, have been studied in this work. The Pollution of studied metals was

assessed using the pollution index (PI), geoaccumulation index (I<sub>geo</sub>), and enrichment factor (EF). The results of calculated PLI showed that the contamination status can more likely belong to the anthropogenic activities in this region. Statistical analyses results also showed that traffic sources and combustion of fossil fuels, as well as industrial activities, are important factors contributing to the rise concentrations of heavy metals in school dust. According to the present situation, the non-cancer risk of individual metals for both, children and adults followed the decreasing trend of Pb > Cr > As > Ni > Cd > Cu > Zn > Co and Cr > Pb > As > Cd >

Ni > Cu > Zn > Co, respectively. The HI value of Pb and Cr for children is very close to the safety limit. However, the HI values of other studied metals were in the safe level. In terms of cancer health risk, Cr, As, and Pb present at most of the study schools were found to be within the cancer threshold limit. Meanwhile, the cancer risk of exposure to Cd, Ni, and Co was the lowest and could be neglected. The findings of the present study indicate that more investigations should be spent to potentially toxic metal contaminations of dust from schools of Shiraz city, especially for Cr, As, and Pb.

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