World Academy of Science, Engineering and Technology
International Journal of Marine and Environmental Sciences
Vol:14, No:05, 2020

Diversity, Biochemical and Genomic Assessment of Selected Benthic Species of Two Tropical Lagoons, Southwest Nigeria

Authors : G. F. Okunade, M. O. Lawal, R. E. Uwadiae, D. Portnoy

Abstract : The diversity, physico-chemical, biochemical and genomics assessment of Macrofauna species of Ologe and Badagry Lagoons were carried out between August 2016 and July 2018. The concentrations of Fe, Zn, Mn, Cd, Cr, and Pb in water were determined by Atomic Absorption Spectrophotometer (AAS). Particle size distribution was determined with wet-sieving and sedimentation using hydrometer method. Genomics analyses were carried using 25 P. fusca (quadriseriata) and 25 P.fusca from each lagoon due to abundance in both lagoons all through the two years of collection. DNA was isolated from each sample using the Mag-Bind Blood and Tissue DNA HD 96 kit; a method designed to isolate high quality. The biochemical characteristics were analysed in the dominanat species (P.aurita and T. fuscatus) using ELISA kits. Physico-chemical parameters such as pH, total dissolved solids, dissolved oxygen, conductivity and TDS were analysed using APHA standard protocols. The Physico-chemical parameters of the water quality recorded with mean values of 32.46 ± 0.66mg/L and 41.93 ± 0.65 for COD, 27.28 ± 0.97 and 34.82 ± 0.1 mg/L for BOD, 0.04 ± 4.71 mg/L for DO, 6.65 and 6.58 for pH in Ologe and Badagry lagoons with significant variations ($p \leq 0.05$) across seasons. The mean and standard deviation of salinity for Ologe and Badagry Lagoons ranged from 0.43 ± 0.30 to 0.27 ± 0.09. A total of 4210 species belonging to a phylum, two classes, four families and a total of 2008 species in Ologe lagoon while a phylum, two classes, 5 families and a total of 2202 species in Badagry lagoon. The percentage composition of the classes at Ologe lagoon had 99% gastropod and 1% bivalve, while Gastropod contributed 98.91% and bivalve 1.09% in Badagry lagoon. Particle size was distributed in 0.002mm to 2.00mm, particle size distribution in Ologe lagoon recorded 0.83% gravels, 97.83% sand, and 1.33% silt particles while Badagry lagoon recorded 7.43% sand, 24.71% silt, and 67.86% clay particles hence, the excessive dredging activities going on in the lagoon. Maximum percentage of sand (100%) was seen in station 6 in Ologe lagoon while the minimum (96%) was found in station 1. P. aurita (Ologe Lagoon) and T. fuscastus (Badagry Lagoon) were the most abundant benthic species in which both contributed 61.05% and 64.35%, respectively. The enzymatic activities of P. aurita observed with mean values of 21.03 mg/dl for AST, 10.33 mg/dl for ALP, 82.16 mg/dl for ALT and 73.06 mg/dl for CHO in Ologe Lagoon While T. fuscatus observed mean values of Badagry Lagoon) recorded mean values 29.76 mg/dl, ALP with 11.69mg/L, ALT with 140.58 mg/dl and CHO with 45.98 mg/dl. There were significant variations ($P < 0.05$) in AST and CHO levels of activities in the muscles of the species.

Keywords : benthos, biochemical responses, genomics, metals, particle size
Conference Title : ICMEP 2020 : International Conference on Marine Environment and Pollution
Conference Location : Montreal, Canada
Conference Dates : May 18-19, 2020