Annual Congress on ENVIRONMENTAL POLLUTION AND SUSTAINABLE ENERGY July 20-22, 2017 Melbourne, Australia

Risk assessment of trace metals in sediment and porewater: The case of the Ogbese river, Nigeria

Isaac Ayodele Ololade¹, Monday Olawale Ajisafe¹, Francis Femi Oloye^{1,2}, Oluwaranti Olubunmi Ololade³, Nurudeen Abiola Oladoja^{1,4}, Samuel Babatunde Obadawo¹, Mayowa Monday Anifowose¹, Thompson A Akinnifesi¹, Adenike Bosede Alabi³ and Adedapo Oluwasanu Adeola¹ ¹Adekunle Ajasin University, Nigeria

²University of Aberdeen, UK

³Federal University of Technology Akure, Nigeria

⁴Technical University of Munich, Germany

The concentration of some essential (Cu, Ni and Zn) and nonessential (Cd, Cr and Pb) trace metals (TMs) in the surficial sediments and porewater (PW) of Ogbese River (OGR) in Ondo State, Nigeria with a view to evaluate ecotoxicological potential was investigated using inductively couple plasma atomic emission spectrophotometry (ICP-AES). Contamination of TMs in both sediments and PW were in the following order: Cu>Zn>Ni>Cr>Cd>Pb. TMs value in sediment (mg kg⁻¹) (PW, mg L⁻¹, in brackets) ranged from 54.2-84.2 (1.0-2.3), 75.5-113.7 (1.5-2.8), 46.7-61.6 (1.0-2.1), 25.5-47.4 (0.6-1.2), 4.1-6.4 (0.4-0.8) and 3.4-4.6 (0.3-0.5), respectively. The study noted that sediments are a key compartment that has to be taken into account in aquatic ecosystem risk assessments. Lead and Cu adsorbs very strongly to the dissolved organic carbon (DOC) in sediments than the other TMs. High OM impeded remobilization of metals from the sediments. The study observed intensive anthropogenic activities significantly contributed to accelerated input of TMs into the river system through run-off. The study truly reflects a case of TM enrichment of the aquatic ecosystem when compared with previous study within the area. The results will be helpful in predicting partitioning behaviors of TMs, their bioavailability (PW concentration) and ecotoxicological potential according to existing numerical sediment quality guidelines which can be applied to similar aquatic environments.

olisa200@yahoo.com, isaac.ololade@aaua.edu.ng