Sediments toxicity in the rivers draining Ibadan metropolis, southwestern Nigeria

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Introduction and Methods

The drainage structures in Ibadan Metropolis are depocenter for both industrial and domestic wastes/effluents [1] contributing potentially harmful elements (PHE) into stream sediments. This study examine the trace metal content in the sediments and evaluate their origin, pollution status and their bioavailability in the environment. Two hundred and thirty three (233) samples from Agricultural, Industrial; Old city, and new city zones (zone 1,2,3,4) respectively; were analyzed using XRD and inductively coupled plasma-mass spectrometry (ICP-MS) and sequential leaches.

Discussion of Results

Kaolinite, illite, montmorillonite and quartz were the dominant minerals. The PHEs concentrations for Cu (18.30-513.00), Pb (40.30-5140.00), Zn (80.90-2450.00), As (0.20-7.10), Cd (0.08-24.40), Cu-Pb-Zn-Cd revealed highest concentrations in the old city (densely populated) and industrial areas of the city respectively. Pollution Load Index (PLI) values for zones 1 to 4 include PLI-127, 471, 582, 512, respectively indicating polluted sediments and metal sources link to human and landuse activities. Percentages of Pb, Zn and Cd ranged correspondingly from 26.4-43.5; 25.5-36.9 and 17.0-51.0 in the exchangeable phase indicating their bioavailability in the environment. Cu, Pb, Zn, Cd and Ni concentrations in all the zones exceeded the threshold values in the sediment quality guidelines (SQGs) suggesting that the sediments were polluted [2].

[1] Camusso, M., Galassi, S. and Vignati, D. 2002. Assessment of river Po sediment quality by micropollutant analysis *Water Res* **36**: 2491-2504. [2] Singh, M., Muller, G. and Singh, I.B. 2002. Heavy metals in freshly deposited stream sediments of rivers associated with urbanization of the Ganga Plain, India *Water Air, and Soil Pollution*, **141**, 35-54.