



## **Trends and Dimension of Heavy Metal Interaction with Microbial Load in Water Bodies in Port Harcourt and its Environs**

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### **Abstract**

The physiological and biochemical properties of microorganisms can be altered by the presence of heavy metals in water body. Microorganisms are highly sensitive to heavy metal pollution and play an important role in the material cycling, energy flow and water quality of the ecosystem. Some of these heavy metals (Fe and Cu) are essential nutrient to the human body but when their amount exceeds the regulatory standard, they can become detrimental. Thus, seasonal trends and dimension of heavy metal interaction with microbial load in water body (borehole, river and well water) was investigated in Port Harcourt and its environs during the dry and wet season of 2021. Seven sampling locations were established and designated as Abuloma (ABU), Borikiri (BOR), Eagle-Island (EIS), Fimie (FIM), Macoba-Isaka, Rumekini (RUM) and Rumuokoro (ROM) respectively. Samples were collected in 10ml sterile containers from running tap, river and hand dogged wells and labeled according to the source and location. Samples for the determination of heavy metal contents were fixed with 2 drops of concentrated trioxonitrate (V) acid (HNO<sub>3</sub>) while that for microbial analysis were preserved in ice chests to inhibit the activity of microbes and were sent to the laboratory for analysis. Findings indicated that the value for heavy metal (Pb and Cu) for the well water had same concentration gradients seasonally with the bacteria enumerations. There were no concurrent increases of heavy metal concentration across the seven sampling stations, albeit, the dry season concentration in most of the heavy is significantly high with a corresponding increase in the microbial load during the dry season. The heavy metals values indicated that heavy metal affect the microbial load. The Pb concentration in surface water for Borikiri during the dry season, well water for Eagle-Island and Fimie during the dry and wet seasons was higher than the regulatory standard. Thus, it is recommended that government should provide basic services such as safe drinking water (pipe borne water) and improved sanitation infrastructures in a bid to prevent water borne or associated diseases. The well water from Eagle-Island and Fimie demand public health attention (removal of Pb). Therefore, such water body for human consumption should be withheld until necessary steps are been taken to ensure good water quality. There should be effort to monitor indiscriminate effluent discharged into river to prevent serious environmental problem in the nearer future in a bid to avert attendant health hazard thereto.

**Keywords:** heavy metal, heterotrophic bacteria, microbial load