

Heavy Metals in Coastal Sediments and Soils Impacted by Anthropogenic Activities in Mauritius

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Extended Abstract

Soils and coastal sediments normally take the brunt of all the anthropogenic wastes created by man. Once the threshold has been reached, the negative impacts of these contaminants start to become apparent through their effects on agricultural productivity, crop yields in terms of quantity and quality. Metals such as lead, copper and nickel, amongst others, can be found in soils in considerable concentrations especially in locations where the use of chemical compounds are intensive. The present study aims at quantifying the concentrations of heavy metals in soils and coastal sediments that are suspected to have been contaminated and evaluating its effect on soil health. Seven land sites and coastal areas were selected based on their land use background and history.

Analysis through a completely randomized design showed significant differences between each heavy metal (Pb, Ni, Zn, Mn, Cu, Cr, Cd) for the 14 sites ($P < 0.05$). A land site next to a petrol station was found to be the most contaminated with respect to Zn (126.65 ppm). This value exceeds the permissible limit recommended by the FAO/WHO [1] (60 ppm) and is consequently very dangerous for human health. Other heavy metal concentration was close to the threshold limits. Pearson correlation of heavy metal concentration with bacterial count (plate count method) showed a general high value. Due to prolonged exposure to high concentrations of heavy metals in the environment, the bacteria have developed tolerance and are able to adapt to the new environment as supported by Rajapaksha et al., [2]. Using Bergey's Manual [3], the main species of bacteria identified were *Bacillus* Spp and *Pseudomonas* Spp. With an increase in the number of bacteria, the rate of respiration also increased and therefore beneficial reactions such as nitrification, carbon fixation, breakdown of contaminants etc...contributed to the betterment of the soil health, as concluded by Hayes and Krause [4].

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References

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