

Comparative Study on Heavy Metal Accumulation in Sediment Samples in China, India and Sri Lanka

Dahanayake¹, N.M.A and *Karunaratne¹, G.H.R.E

¹Faculty of Science, Horizon Campus, Knowledge City Malabe, Sri Lanka

*Corresponding E- mail: ekarunaratne@horizoncampus.edu.lk

Due to anthropogenic activities heavy metals in the environment tend to reach concentrations which are not permissible, causing adverse health conditions. These elements enter into the human body through dermal, inhalation, and ingestion pathways and may create carcinogenic, mutagenic and teratogenic toxic effects. Due to their ubiquitous nature, persistence and nonbiodegradability, and Toxicity in humans, and due to over exposure to heavy metals results in bioaccumulation and bio-magnification along food chains and ultimately lead to destruction of organisms and ecological systems. Excessive heavy metal accumulation in agricultural soils may lead not only in soil contamination but also affect food quality. Therefore, this review was done to identify the heavy metal accumulation on three selected samples of the Asian countries: Sri Lanka (Colombo city dust), China (Dongting Lake) and India (Pondicherry) in order to derive basic understanding on the heavy metal accumulation. Research articles (132) were initially collected based on carcinogenic heavy metals in sediment. Colombo city dust has recorded the highest accumulation for Zn (339 mg/kg) and Cu (173.5 mg/kg) in Sri Lankan sediment samples. Then, two Asian countries India and China were selected based on the high rate of anthropogenic activities. However, depending on the sample location the heavy metal accumulations may vary. Hence, the evaluation is done to compare the heavy metal composition on the three sample sites. Pondicherry has recorded as having the highest Cr (334 mg/kg) accumulation in sediment samples, Ganges River in India was reported as having high-Ni (48 mg/kg) content while the Dongting lake in China recorded as having the highest concentrations of Zn (322.6 mg/kg), and Pb (57.96 mg/kg). In conclusion, accumulation of heavy metals among the three sediment samples, Colombo city dust in Sri Lanka is reported as the highest while the second highest is reported at Dongting Lake in China, and third highest at Pondicherry, India.

Keywords: Anthropogenic sources, heavy metal concentrations, sediment samples, soil toxicity