

**STUDY ON ACCUMULATION LEVELS OF Pb, Hg
AND Cd IN TWO SELECTED RESERVOIRS IN
BADULLA DISTRICT, SRI LANKA**

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by

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Abstract

Contamination of aquatic ecosystems with heavy metals is an emerging problem in Sri Lanka. Ulhitiya and Mapakada are two reservoirs situated in Badulla District, Sri Lanka. They are important for inland fishery, flow balancing and irrigation. The aim of this study was to determine the levels of Pb, Hg and Cd in sediment, surface water, fish skin, fish gill and fish muscle samples of Ulhitiya and Mapakada reservoirs. Sampling sites were selected for each reservoir based on simple random sampling method to represent entire reservoir. Collected fish, sediment and surface water samples were subjected to microwave accelerated acid digestion before the analysis. Pb, Hg and Cd concentrations of digested fish, sediment and surface water samples were determined using atomic absorption spectroscopy (AAS). The data obtained were analyzed using multivariate analysis. Results revealed that Hg was not detected in all the surface water and sediment samples of both reservoirs. Pb was not detected in all fish samples of both reservoirs. Moreover, all three heavy metals were not detected in all the water samples in both reservoirs. The mean concentrations of heavy metals namely Pb and Cd in sediments of Ulhitiya reservoir were recorded as 6.357 ± 0.871 , 0.081 ± 0.024 mg kg⁻¹ and Pb and Cd concentrations in sediments of Mapakada reservoir were recorded as 8.809 ± 1.041 , 0.104 ± 0.029 mg kg⁻¹. The mean concentrations of Hg and Cd in fish samples of Ulhitiya reservoir were recorded as 0.008 ± 0.031 , 0.002 ± 0.005 mg kg⁻¹ besides Hg and Cd concentrations in fish samples of Mapakada reservoir were recorded as 0.000 ± 0.000 , 0.106 ± 0.026 mg kg⁻¹ respectively. Significant differences accepted at $P \leq 0.05$. As per the results of the study, no significant differences were observed in Pb and Cd concentrations of sediments between two reservoirs. In addition, no significant differences were observed in Hg and Cd concentrations of fish samples between two reservoirs. Thus, it can be concluded that Pb, Hg and Cd concentrations in water of these two reservoirs do not exceed the maximum allowable limits stipulated by WHO and EU for drinking purposes. Nevertheless, sediments are considerably comprised of Pb and Cd in both reservoirs. Therefore, it is important to mitigate the emission of untreated water and sewage into the reservoirs.

Keywords: Reservoirs, Fish, Water, Sediment, Pb, Hg, Cd, Uva province