ACCUMULATION OF LEAD, CADMIUM AND COPPER IN TWO SPECIES OF FOOD FISH, *Oreochromis mossambicus* AND *Heteropneustes fossilis* IN SELECTED INLAND WATER BODIES IN SRI LANKA

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ABSTRACT

Accumulation of three heavy metals, lead, cadmium and copper in two species of food fish, *Orechromis mossambicus* and *Heteropneustes fossilis* in three inland water bodies in Sri Lanka viz. Bolgoda Lagoon, Beira Lake and Parakrama Samudra during 1999 was investigated. The levels of the three metals in water and sediments of the water bodies were also monitored during the study period.

The highest concentrations of all three metals were found in Bolgoda Lagoon: copper 0.10 mgl^{-1}; cadmium 0.16 mgl^{-1} and lead 0.50 mgl^{-1}. Concentrations of cadmium and lead in Bolgoda Lagoon and Beira Lake exceeded the safe upper limits of concentration of Cd and Pb for potable drinking water.

The mean levels of lead in the muscle of fish collected from three water bodies ranged from 15.4 – 26 $\mu g\ g^{-1}$ in *Oreochromis mossambicus* and 11.99 – 30.05$\mu g\ g^{-1}$ in *Heteropneustus fossilis.* The mean levels of cadmium in the fish muscle ranged from 3.16 – 5.11$\mu g\ g^{-1}$ in *Oreochromis mossambicus* and 3.83 – 10.8$\mu g\ g^{-1}$ in *Heteropneustus fossilis*. The levels of lead exceeded the critical levels specified by FDA for fish and fishery products. The cadmium levels in the muscle of fish from Bolgoda Lagoon exceeded the critical levels where as the levels in fish from Beira Lake and Parakrama Samudra were near the critical limits. The mean levels of copper in fish muscle ranged from 0.76 – 2.56 $\mu g\ g^{-1}$ in *Oreochromis mossambicus* and

2.37 – 4.47µg g^{-1} in *Heteropneustus fossilis*. These levels were below the statutary limits for copper in food.

However the levels of three metals in liver of fish were 2 – 95 folds higher than the levels of specific metal in the muscle tissue of the same fish. The levels of metals in liver exceeded the statutory limits specified for food standards.

Although comparatively lower concentrations of lead and cadmium were found in the water and sediments of Parakrama Samudra, bioaccumulation factors for the metals in Parakrama Samudra were 2 – 7 folder higher than those in the other two water bodies resulting accumulation of considerably high levels of three metals in the fish tissues. Species wise comparison of the metal levels in the two species showed that there is no significant species specific difference in the bioaccumulation of the three metals except accumulation of cadmium in fish from Bolgoda Lagoon and copper in liver tissue of the fish in Parakrama samudra. The metal levels of the tissues were positively correlated with the body weight of fish in several occasions. The results of the present investigation revealed that there is a risk of contamination of lead and cadmium in the human body through consumption of inland food fish especially from Bolgoda Lagoon and Beira Lake.