

**BIOACCUMULATION OF CADMIUM (Cd) AND
MERCURY (Hg) IN TILAPIA (*Oreochromis niloticus*)
FISH MUSCLES FROM THREE MAIN
RESERVOIRS IN BADULLA DISTRICT;
IMPLICATIONS ON FOOD SAFETY**

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by

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ABSTRACT

Bioaccumulation of toxic trace metals in fish muscle is a major issue in the aquatic environment. The consumption of toxic trace metal contaminated fish cause health risks to human. The objective of the present study was to determine cadmium (Cd) and mercury (Hg) concentrations in muscle tissues of tilapia (*Oreochromis niloticus*) randomly collected from Sorabora (n = 8), Mapakada (n = 7) and Ulhitiya (n = 9) reservoirs in Badulla District from September to October 2016. The samples were digested by microwave accelerated system and Cd & Hg concentrations in muscle tissues of each fish were determined by Atomic Absorption Spectrophotometry (AAS). The recorded mean concentration of Cd in Sorabora reservoir was 0.024 ± 0.026 mg/kg and Hg was not detected, while 0.018 ± 0.005 mg/kg Cd was recorded for Mapakada reservoir and Hg was not detected. The mean concentrations of Cd & Hg in Ulhitiya reservoir were recorded as 0.009 ± 0.001 mg/kg and 0.049 ± 0.136 mg/kg, respectively. The mean concentrations of Cd & Hg those were recorded for three reservoirs were lower than the maximum permissible levels of these two toxic trace metals (Cd < 0.05 mg/kg & Hg < 0.5 mg/kg) recommended by the European Union and Sri Lankan guide lines for food fish. The amount of fish that should be consumed to fulfill weekly protein requirement (total amount by eating fish) of a healthy person was calculated according to the guidelines of the World Health Organization. Thereby, the Probable Weekly Intake (PWI) levels of Cd & Hg were calculated (0.00009 and 0.0001 mg/kg of body weight per week, respectively) and those values were well below the Provisional Tolerable Weekly Intake (PTWI) recommended (0.275 for Cd & 0.385 mg/kg of body weight per week for Hg) by the Joint Expert Committee for Food Additives (JECFA - FAO and WHO). The results indicate that the consumption of *O. niloticus* fish from studied three reservoirs are generally safe in terms of toxicity risk by Cd & Hg for human health.

Key words: Tilapia (*Oreochromis niloticus*), Cadmium (Cd), Mercury (Hg), Bioaccumulation, Health risk