Bioaccumulation study of toxic and essential metals in muscle, liver, and gills of *Perca fluviatilis* L. in Anzali Wetland

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Abstract

The present study intended to investigate the bioaccumulation of six non-toxic (copper, nickel, iron, zinc, manganese, aluminum) and five toxic (lead, cadmium, mercury, arsenic, chromium) metals in edible (muscle) and inedible (liver, and gills) tissues of *Perca fluviatilis L*. (Perch) in Anzali Wetland. A sample size of 20 fish was caught in May 2015 from Anzali Wetland and MOPPAM method and atomic absorption device were used to prepare and analyze the samples. The results showed that metal accumulation was significantly different among the three tissues of liver, gill and muscle in a descending order. The accumulation of non-toxic metals Cu, Ni, Fe, Zn, Mn, Al, in muscle 4.84, 0.42, 64.32, 13.2, 0.09 and toxic metals Pb, Cd, Hg, As, Cr 0.87, 0.47, 0.11, 0.07, 0.57; non-toxic metals in liver 136.52, 0.92, 377, 64.97, 60.16, 0.21 and toxic metals 1.25, 0.92, 0.35, 0.18, 0.98; non-toxic metals in gills 97.63, 0.66, 284.33, 47.15, 53.79, 0.15 and toxic metals 1.05, 0.67, 0.25, 0.13, 0.84 were respectively. Pearson's correlation *coefficient* showed that the accumulation of metal uptake in muscle had a significant direct relationship with the uptakes in liver and gills. Moreover, investigating the relationship between metal uptakes showed that all metals had significantly positive relationships with one another except lead. Comparing the metal bioaccumulation in muscle with WHO standards showed that the accumulation of all metals except lead, cadmium and manganese was lower than standard limits. The concentrations of all metals were below NHMRC standard while their concentrations except for lead and mercury were below MAFF standard.

Keywords: Toxic and non-toxic metals, *Perca fluviatilis*, Anzali Wetland.