

Toxicological Effects of Heavy Metals; Copper, Lead and Chromium on Brain and Liver Tissue of Grass Carp (*Ctenopharyngodon idella*)

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Abstract : The present study deals with the toxicological effects of copper, lead and chromium on brain and liver tissues of grass carp (*Ctenopharyngodon idella*). The average length of experimental fish was 8.5 ± 5.5 cm and weighed 9.5 ± 6.5 g. Grass carp was exposed to lethal concentration (LC_{15}) of copper, lead and chromium for 24, 48, 72 and 96 hours respectively. (LC_{15}) for copper was 1.5, 1.4, 1.2 and 1mgL^{-1} . Similarly, LC_{15} of lead was 250, 235, 225 and 216mgL^{-1} while (LC_{15}) for chromium was 25.5, 22.5, 20 and 18mgL^{-1} respectively. During the time of exposure against various doses of heavy metals the grass carp showed some behavioral changes. In the initial stages of experiment, the rapid movements and gulping of air were observed. Several times the fish tried to jump to scat from the toxic median. In addition, the accumulation of heavy metals in different tissues of grass carp particularly in liver and brain tissues were observed. Lead was highly accumulated in brain tissue after the exposure of fish for 24 and 48 hours, while highly accumulated in liver tissues after the exposure of fish for 72 and 96 hours. Chromium was highly accumulated in the liver tissues after the exposure of fish for 24 hours while its accumulation was found highly in the brain tissues after the exposure of fish for 48, 72 and 96 hours. Similarly, accumulation of copper concentration was found highly in brain tissues after the exposure of 48 and 96 hours while its accumulation was high in liver tissues after the exposure of 24 and 72 hours. Comparatively maximum accumulation of lead was found in brain and liver tissues of grass carp followed by chromium and copper. Furthermore, accumulation of these metals caused many abnormalities like gliosis, destruction of cell, change in cell shape and shrinkage of cells in brain tissue while in liver tissues aggregation in hepatocytes, widen space between cells and also destruction of cell was observed. These experiments and observations can be useful to monitor the aquatic pollution and quality of aquatic environment system.

Keywords : brain, grass carp, liver, lethal concentration, toxicity

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