HEXAVALENT CHROMIUM-INDUCED OXIDATIVE STRESS IN LIVER AND KIDNEY OF GOLDFISH, *Carassius auratus*

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**Abstract:** Chromium is a heavy metal. It is also the sixth most abundant element in the earth’s crust. It is a common contaminant in ground-water and surface water; it also enters into the environment from various industrial processes. The release of chromium containing effluents into the environment causes major threat to the ichthyofauna. Oxidative stress is a state in a cell or an organism that causes imbalance between oxidants and antioxidants. Accumulation of oxidants in a cell develops oxidative stress and hampers the metabolic processes. In this research we have studied the oxidative stress in Goldfish with different antioxidants levels in liver and kidney at different concentrations (LC 12.5 (21.42 ppm), LC 25 (42.85 ppm) and LC 50 (85.7 ppm)) of hexavalent chromium for 96 hr static renewal bioassay. The activity of superoxide dismutase increased in both liver and kidney, however this activity significantly increased in the liver at LC 25 and LC 50, and in the kidney at LC 12.5, LC 25 and LC 50 compared to the control. The activity of catalase slightly decreased in liver and kidney but the decrease was not significantly different (p<0.05) from controls at all the concentrations of chromium. The hydroperoxide levels were elevated in both liver and kidney at all the concentrations of chromium due to lipid peroxidation of saturated and unsaturated fatty acids. The elevated levels of hydroperoxides in both liver and kidney were significantly different from the controls at all the three concentrations. Metallothionein (MT) concentrations were increased in liver and kidney at all the three concentrations compared to the control and the increase in MT concentrations was significantly different in liver at all tested concentrations, and only at the LC 50 concentration in the kidney. The altered enzyme activities and elevated levels of MT and hydroperoxides clearly indicate the biochemical responses of Goldfish to chromium-induced oxidative stress.

**Keywords:** Chromium, oxidative stress, superoxide dismutase, catalase, hydroperoxides, metallothionein, goldfish

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