

## Acute and Chronic Toxicity of Chromium, Behavioral Responses and Histological Changes in the Carp (*Cyprinus carpio* L. 1758)

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**Abstract:** The aim of this study was to determine the acute and chronic toxicity of chromium for common carp of *Cyprinus carpio*. The specimens of *Cyprinus carpio* were exposed to chromium to determine the median lethal concentration (LC<sub>50</sub>) value and effects of sub-lethal concentrations on behavioral responses and Histological Changes. The LC<sub>50</sub> (median lethal concentration) of chromium on *Cyprinus carpio* were 59.673, 59.527, 58.770 and 57.723 mg/L respectively. Fishes exposed to sub-lethal concentrations (9, 18 and 22 mg/L) for 3 and 6 weeks. In general, behavioral responses under this investigation showed prominent changes of uncontrolled swimming, erratic movements, equilibrium loss, swam near the water surface with sudden jerky movements and opened mouth finally settles to the bottom. Histological studies in organs like gill, liver, muscle and kidney of *Cyprinus carpio* community were made to assess tissue damage due to sublethal concentration of heavy metals chromium after 3 and 6 weeks of exposure. Several histological alterations were observed in the gills, including the epithelium of gill filaments and secondary lamellae, congestion of secondary lamellae and short villi. Dilation and congestion in gill filaments blood vessel, heavy inflammatory cells infiltration with absence of cartilage and inflammatory cells infiltration. The liver showed dilation in cells hepatic, congestion with necrosis and mild chronic inflammatory cells infiltration, cells hepatic degeneration, degenerative changes of hepatocyte cells with excessive accumulation of cholesterol inside the cell and apoptosis cell. In the muscle, showing mild hyalinization of skeletal muscles fibers, atrophy of skeletal muscles fibers. Regarding in kidney, dilation in renal cells, degenerative changes in shape cytoplasmic, renal tissue showing mild necrosis of epithelial cells with mild chronic inflammatory cells infiltration and haemorrhage. It was concluded that the heavy metal such as chromium caused several histological alterations in the tissues of common carp of *Cyprinus carpio*.

**Keywords:** *Cyprinus carpio*, LC<sub>50</sub>, Chromium, Behavior, Histological Changes

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