

Histopathological Assessment for Acute Exposure to Hazardous Chemicals on Freshwater Fish

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The effects of 31 hazardous chemicals, including acids/bases, heavy metals and organic solvents which are commonly monitored in industrial effluent, on fish tissue were studied in order to assess the fish kills by the acute exposure of these chemicals. The common carps (*Cyprinus carpio*) were exposed to one, single and lethal dose over 30 min or 96 hrs.

The concentrations of chemicals for the acute exposures were determined by acute toxicity test which were 5.0-1000 mg/l and 0.3-200 mg/l for 30 min and 96 hrs exposures, respectively. The gill, caudal fins, liver, kidney, spleen and anterior intestine were then histopathologically investigated.

In addition, other species of freshwater fish such as bluegill (*Lepomis macrochirus*), striped shinner (*Pungtungia herzi*), oily bittering (*Acheilognathus koreanus*) were also tested to figure out the differences in the sensitivity between species. For the evaluation of microchange in fish tissue of inner organ the transmission electron microscopy was performed.

As results, histopathological changes in carp exposed to chemicals could be classified into 33 major symptoms. When compared to controls, the representative symptoms include telangiectases in gills, detachment of epithelial cells, blood congestion, dilation of renal tube, enlargement of elipsoid space, etc., depending on the chemicals or chemical groups. It was found that the most sensitive organs to acute exposure of chemicals varied with chemical groups. Among freshwater fish species, oily bittering was observed to be most sensitive to the chemical exposure. On the other hand, bluegill tissue was found to be relatively resistant with chemicals

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