Sub-lethal toxicity of chlorpyrifos on Common carp, Cyprinus carpio (Linnaeus, 1758): Biochemical response

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Abstract:

Chlorpyrifos, an organophosphate pesticide, is widely used to control pests in agriculture farms and orchards of fruit trees. In this study, the fish were exposed to sub-lethal concentrations of chlorpyrifos which were determined based on numerical value of 96 h LC50. Blood was sampled after 10, 20 and 30 days and biochemical parameters including glucose, total protein, albumin, globulin, triglyceride and cholesterol levels, and aspartate aminotransferase (AST), alanine aminotransferase (ALT), lactate dehydrogenase (LDH), creatine kinase (CK), alkaline phosphatase (ALP) and acetylcholinesterase (AChE) activities were measured. Behavioral changes in the fish were also recorded during the experiment. Unbalanced swimming, swimming in the surface water and hyperglycemia, increased blood triglyceride, and increased levels of AST, LDH and CK activities as well as decreased levels of AChE activity were important changes that were observed in the specimens exposed to chlorpyrifos during experimental periods. The most important alterations in the blood biochemical parameters were measured in the specimens exposed to 40 µg/L chlorpyrifos on the 20th and 30th day of the trial. In conclusion, results of the present study indicated that exposure to sub-lethal concentrations of chlorpyrifos as low as 40 µg/L may cause biochemical and behavioral changes in Cyprinus carpio.

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