**Abstract**

This study aimed to evaluate the median lethal concentration (LC50), acute (24 and 96 h) and sublethal (35 d) effects of deltamethrin, a synthetic pyrethroid pesticide on hormonal and enzymological responses in an Indian major carp, *Labeo rohita*. In this study, the LC50 values of deltamethrin for 24 and 96 h were found to be 0.438 and 0.38 mg L-1, respectively. During acute (0.438 mg L-1) and sublethal (1/10th of 24 h LC50 value, 0.0438 mg L-1) studies, plasma cortisol and prolactin levels were significantly increased (p< 0.05). When compared with the control group, a significant (p< 0.05) increase in alkaline phosphatase (ALP) activity was observed in liver and kidney of fish treated with deltamethrin. However, a significant decrease in the activity of acid phosphatise (ACP) was observed in liver and kidney of deltamethrin exposed fish. In addition, cholinesterase (ChE) activity was significantly (p <0.05) decreased in the plasma of fish exposed to both acute and sublethal concentrations of deltamethrin. These results suggest that the tested concentrations of deltamethrin could have significant adverse effects on the hormonal and enzymological parameters of fish *L. rohita.* The alterations of these parameters can be effectively used to monitor the impact of deltamethrin in aquatic ecosystem.