ABSTRACT OF THE THESIS

Man uses a variety of synthetic material for his comfortable materialistic life. Thus human interactions may become harmful for various terrestrial and aquatic lives. This is by contaminating their habitat and by becoming a threat to organisms itself. Thus the application and dispersal of several organic pollutants can lead to the development of several mutated forms of the species when exposed to sublethal concentrations of the pollutants. Otherwise, a decrease in number or extinction of these exposed species from earth’s face may happen. Pesticides, we use for the benefit of crop yield, but its persistence may become havoc to non-target organism. Pesticides reaching a reservoir can subsequently enter the higher trophic levels. Organophosphorus compounds have replaced all other pesticides, due to its acute toxicity and non-persistent nature.

Hence the present study has concentrated on the toxicity of the largest market-selling and multipurpose pesticide, chlorpyrifos on the commonly edible aquatic organism, fish. The euryhaline cichlid Oreochromis mossambicus was selected as animal model. The study has concentrated on investigating biochemical parameters like tissue-specific enzymes, antioxidant and lipid-peroxidation parameters, haematological and histological observations and pesticide residue analysis.

Major findings of this work have indicated the possibility of aquatic toxicity to the fish on exposure to the insecticide chlorpyrifos. The insecticide was found as effective to induce structural alteration, depletion in protein content, decrease in different metabolic enzyme levels and to progress lipid peroxidation on a prolonged exposure of 21 days. The ion-transport mechanism was found to be adversely affected. Electrophoretic analysis revealed the disappearance of several protein bands after 21 days of exposure to chlorpyrifos. Residue analysis by gas chromatography explored the levels of chlorpyrifos retaining on the edible tissue portions during exposure period of 21 days and also on a recovery period of 10 days.