PREFACE
Among the many stressful environmental factors to which animals are subjected to, xenobiotics have become more and more relevant due to anthropogenic impact on the environment. Industrial and domestic wastes have been dumping a wide range of chemicals to natural habitats. Phenol and its compounds are ubiquitous water pollutants which come to the natural water resources from the effluents of chemical industries such as petrochemical, paint, textile, etc and in non-specific pesticides, herbicides, bactericides and fungicides. The contamination of water bodies with phenol is a serious problem in terms of environmental considerations due to its high toxicity.

In the present study five species of commonly occurring freshwater fish viz., *Catla catla*, *Labeo rohita*, *Cirrhinus mrigala*, *Ctenopharyngodon idella* and *Channa punctatus* were selected. Though sufficient literature exists on other fish, the data regarding the toxicity and effect of phenol to these fishes were scarce. Hence, the present work was undertaken to determine the toxicity of phenol to the fish and its effect on the fish *Labeo rohita*.

The thesis includes seven chapters. The first chapter deals with the introduction which includes: history of phenol usage, physical and chemical properties of phenol, sources of environmental contamination, earlier work, significance of the present study and morphological characters of the selected fishes.

In the second chapter, toxicity methodology adopted and experimentation of phenol to the freshwater fishes *Catla catla*, *Labeo rohita*, *Cirrhinus mrigala*, *Ctenopharyngodon idella* and *Channa punctatus* for 24, 48, 72 and 96 h in static, static renewal and continuous flow-through systems along with behavioral changes were presented.
The third chapter deals with the effect of sublethal (5.02 mg l\(^{-1}\), 1/5 of static LC\(_{50}\)-96 h) and lethal concentration (25.09 mg l\(^{-1}\), static LC\(_{50}\)-96 h) of phenol on the oxygen consumption and hematological parameters of the fish *Labeo rohita*.

Biochemical changes in the tissues of the fish *Labeo rohita* exposed to sublethal and lethal concentration of phenol for 4 and 8 days were presented in fourth chapter. The biochemical parameters assayed include: Glycogen, total proteins and enzymes such as lactate dehydrogenase (LDH), aspartate amino transferase (AST), alanine amino transferase (ALT), acid phosphatase (ACP) and alkaline phosphatase (ALP).

The fifth chapter includes the effects of phenol on the histology of gill, liver and kidney of the test fishes after 8 days of exposure to sublethal and lethal concentration of the toxicant. Marked degenerative changes in the general histology of the fish *Labeo rohita* were presented.

In the sixth chapter, the uptake and depuration of phenol in various tissues were studied. For uptake studies the fish *Labeo rohita* were exposed to sublethal concentration of phenol for 0.5, 3, 6, 12, 24, 48 and 96-h and for depuration the exposure period was followed by their culture in running water. Qualitative confirmation of the residues by thin layer chromatography (TLC) and quantitative analysis by spectrophotometry were presented.

The results obtained in all the above studies were summarized in the final chapter.