This thesis entitled, 'Studies on physio-pathological effects of pesticides on some common Indian birds', is intended to serve as an introduction to certain aspects of structural, functional and biochemical toxicity of pesticides in Indian birds. The biocidal chemicals, PESTICIDES, are no doubt highly poisonous group of substances. Among environmental pollutants pesticides are unique in that they are present in minute quantities almost everywhere on the surface of earth and their effects are confined exclusively to biological systems. Insecticides constitute the most numerous and valuable pesticides. The necessity to use them properly forced people to learn how such low levels of these chemicals interfere with living systems and how living organisms react to these chemicals. Indeed, knowledge of pesticidal effects on wildlife is crucially important to assess environmental impact of such chemicals.

Assessment of impact of chemical pollutants on wildlife is a very recent concept. It is fostered, even necessitated, by a number of factors, most important being the heightened awareness of the adverse effects of such chemicals to wildlife. This is a significant departure from the traditional concerns of toxicologists only for man and his domestic animals. The new awareness has enlarged the domain of environmental toxicology to incorporate all forms of biological systems, specially the wildlife and the entire spectrum of ecosystems, physical environments, the biosphere, and even the total environment on a global scale. Despite these roots, however, toxicological studies on wildlife, particularly on birds, is rather limited.
From remote past birds indeed have had an uneasy coexistence with man. Excessive killing, habitat destruction etc., have often threatened, even exterminated many species of the winged denizens. They are also more susceptible to insecticides than any other form of wildlife (Matsumura, 1976). The number of such compounds of real concern is relatively small, but it is the extensive use which brought them within nearly every bird habitat in the world. A few are liable to cause acute mortality in certain applications, particularly when they are applied selectively on materials on which the birds may feed. In second instance birds of prey may be killed as well. This happens when seeds of cereals and pulses are dressed, for instance with insecticides like aldrin, dieldrin or alkyl-mercury compound before sowing. There is evidence that in Britain, Netherlands and Sweden the seed dressing application of the substances mentioned here has been an important cause in the decline of birds of prey.

Decline of bird population is often induced through other subtle ways. About three decades ago, Europe and North America witnessed a sudden crash in population of a number of raptorial birds like peregrine, bald eagle, osprey, Cooper's hawk, golden eagle, kestrel, sparrow hawk etc. Population decline of these birds are traceable not to the killing of adults or change in their behavior or habitat, but to a drastic drop in reproduction due to abnormal physiological changes caused by the persistent pesticides i.e., the chlorinated hydrocarbons. There may be many more long-term effects of such insecticides too delicate and too difficult to detect in the field and therefore calls for further laboratory study and scrutiny of their possible adverse effects.
With this idea in mind, the present study was undertaken. Initially subacute toxicity studies of some selected insecticides (organochlorine, organophosphorus and carbamate) have been undertaken to observe the pesticidal effect on hemopoietic system and microscopic structure of different visceral organs. In the next phase the organ function studies of liver and kidney of selected birds were carried out. The alterations noted in the above studies have been followed biochemically by the assessment of catecholamines, acetylcholine level and acetylcholinesterase activity in the brain. Finally analysis of residue in various organs and serum of selected birds were undertaken.

The thesis covering the above aspects has been presented in seven chapters in a logical sequence with the relevant references annexed at the end of the work. In the conclusion, the detailed studies have been linked up in a manner to justify the relevance of the work in establishing the degree of short- and long-term toxicity of the selected insecticides to birds.