PREFACE

Modern civilization imposed increasing demands on agricultural productivity concomitantly aided introducing a variety of chemicals as pesticides in agricultural practices. The wide spread use of these chemicals had played a major role as an integral component of the ‘Green Revolution’ to alleviate the nutritional needs of the rapidly expanding population. Further, the pesticides have brought remarkable, social and economic gains due to their role in the eradication of vector borne diseases. The inadvertent and injudicious use of the pesticides paved the way for the environmental pollution.

Among the different habitats, aquatic environment is the main target of pollution, as water happens to be the universal solvent. As such, water became the home of the effluents, byproducts, heavy metals, pesticides and so many biological contaminants. As a result, the fauna and flora are forced to contain different levels of these contaminants and their residues either directly or indirectly through the food chain cycle. Man, who posse himself as at the peak of the food pyramid, is facing the accumulated hazardous effects of these contaminants for which he has responsible.

Organophosphate compounds are widely used in the pesticidal area for a long time. Owing to their lipophilic nature, these pesticides pose serious health hazards in non-target organisms through bio-magnification and accumulation in the ecosystem thereby disrupting the ecological balance by intervening the members of the food chain.

The out break of Handigodusyndrome in the agricultural labourers of the Handigodu village in the Karnataka state in India, is a clear example of the biologica uptake of pesticides and their consequent effects. The cause of these diseases is ascribed to the long term consumption of the crabs from the paddy fields in the area, which were sprayed indiscriminately with the highly toxic endrin and follidol. This became the impetus for the present investigation on the pesticide effects on a non-target species. Keeping these points in view, the present investigation was aimed at examining the physiological and biochemical effects of organophosphate insecticide, phosalone on the crab, *Oziotelphusa senex senex* (fabricious), which inhabits the paddy fields and is a diet for poor people.
The findings of the present study are presented in four chapters. The first chapter deals with the calculation of LC$_{50}$/96 h of phosalone to *O.senex senex* and with the behavioural changes of crabs during phosalone intoxication. The second chapter comprises histosomatic indices and hydromineral (ionic) regulation. The third chapter summarises results on oxygen consumption, tissue respiration and enzymes related to energy metabolism. The fourth chapter contains data on a few aspects of the carbohydrate metabolism, nitrogen constituents and lipid metabolism. The chapters are followed by the summary and conclusions and the literature cited.

The results presented in this thesis are by no means complete and comprehensive and represents only a preliminary efforts on the part of the author towards an understanding of the hydromineral regulation and metabolic implications of pesticide toxicity. However, the results obtained and conclusions drawn are quite pertinent and useful when viewed against the multitude of resource constraints. It is the humble belief of the author that he has succeeded, atleast, in part, the making of the people realise the dire consequences of injudicious use of highly persistent OP insecticides in controlling insect pests.