PREFACE

The laboratory of Zoology Department of Shivaji University, Kolhapur (Maharashtra), India has been engaged in extensive work on some hitherto neglected biochemical and histochemical aspects of animal metamorphosis and, as can be judged from the literature several papers have been published in various international Journals devoted to various disciplines; mainly the behaviour and functional significance of lysosomal enzyme, β-glucuronidase and the most ubiquitous naturally occurring metabolites the lipids, have been studied in somewhat greater details in the metamorphic events in both the anurans and insects.

Insect metamorphosis is very complicated affair to deal with, not only because it represents in its most advanced state such a profound conversion of the living system, but also because there exist within the insect groups so many gradations in transforming changes, when the larva develops in to the imago. The biochemistry and physiology of insect development and metamorphosis has been the object of many investigators, but in most of the cases enzymes, proteins, nucleic acid, and lipids have been studied in detail. Most of the aforementioned work has been carried out with the experiments in which homogenates

of whole insects and that to in the one of the stage of either egg development, larval growth or pharate adult development is used. While such experiments can give useful general information concerning the occurrence, quantity and interconversion of metabolites and the enzyme systems involved, they reveal little about location, transfer or change within the insect and during the life cycle. Insects are known to be characterized by an unusually high concentration of free amino acids and studies on the metabolism of amino acids in insects have yielded a wealth of data. Though the pattern of free amino acids have been worked out in several dipteran species, there is no work on Chrysomyia rufifacies. To get a clear insight into the biochemical aspects of free amino acids and their relation to metamorphic events involving transition from one type of habitat to another, a change in the diet and also those changes of adaptive value in which both histolysis and histogenesis occur significantly, a detailed investigation of the alterations in the free amino acids in the insect metamorphosis was felt unavoidable and hence desirable. It is through the present thesis for the first time that a detailed analysis of total and individual free amino acids, and alterations in them during embryogenesis, larval

growth and metamorphosis of Chrysomyia are being brought to light. The free amino acid alterations not only in the entire insects but also in metabolically important organ systems in growth and metamorphosis, have been reported in the present thesis, along with their probable functional significance and also importance in various metamorphic events. To achieve technological perfection both the recent and well established biochemical techniques involving paper and thin layer chromatography have been employed.

For the sake of convenience and ease of understanding, the thesis is divided into seven chapters with a concluding chapter on general discussion. The first chapter gives a detailed and critical account of the existing literature on the biochemistry of insect metamorphosis. It also gives the outlines of the plan of the present investigation along with the reasons that lead to take up this work. The second chapter describes the materials and the biochemical techniques employed in the present work. Chapters three to five describe the free amino acids in embryogenesis, larval growth and metamorphosis respectively. Chapter Six deals with alterations in the fat body and haemolymph during larval growth and metamorphosis. The last Chapter gives a general

discussion of the observed facts with reference to comparative visualization of the free amino acid composition and alterations in them during embryogenesis larval growth and metamorphosis. I assume responsibilities for the opinions expressed in the present thesis and also for omissions and errors, if any, in the body of thesis.

I wish to express my deep gratitude to Dr.V.A. Sawant, Lecturer in Physiology Department of Zoology for his valuable guidance scholarly criticism of the work and many inspiring discussions.

I owe and wish to be thankful to my institution Shri Swami Vivekanand Shikshan Sanstha, Kolhapur and Prin. Mrs. Vijaya Patil, A.C.S.College, Miraj and Prin. D.A.Patil A.S.C. College, Ichalkaranji, who gave me an opportunity to deal with my research work.

Also I would like to make a grateful mention of the inspiration and encouragement, I received from respected late Mr. Dattajirao Kadam (Ex.M.P.)Ichalkaranji, during my education.

I would like to express my deep gratitude to the Head of the Zoology department and authorities

of the Shivaji University for allowing me to work in the university department of Zoology and providing me all possible facilities.

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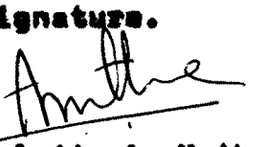

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