PREFACE

The crustaceans have been called the "Insects of the Sea" which has juxtaposed the physiologists since many decades. This group of arthropods present exciting problems at all levels of organization from the cellular to the organismic. In addition, in a more applied vein, the study of Mandibular Organ in Crustacea has opened a new vista to the endocrinologists and holds promise of attaining in the future, an even more prominent position in the panoply of biological fields of inquiry.
Le Roux (1968) described a pair of ductless glandular organs in the cephalothorax of decapod crustaceans. He named them as "Mandibular Organs" (MO) because of their proximity to the mandibles. Since then, some studies on the ultrastructure and physiological role of the mandibular organ of some crustaceans have been made (Nagabhushanam and Fingerman, 1990). However, the exact role of this enigmatic organ has not yet been firmly established. Only a cursory study has been made on the mandibular organ and its control on physiology of the natantians.

The changes in the mandibular organ cells occurred after eyestalk ablation in some crustaceans. While in others, implants of the mandibular organ accelerated molt or stimulated vitellogenesis. The major secretory products of the mandibular organ in crustaceans appears to be Methyl Farnesoate (MF) which is a precursor of Insect Juvenile Hormone III. However, in the crab,
*Scylla serrata* Farnesoic Acid (FA) appears to be the major product of the mandibular organ. The possible endocrine role of the MF and FA in crustaceans remains to be elucidated.

The current probe highlights the comparison of mandibular organ in the freshwater prawn, *Macrobrachium kistnensis* and crab, *Barytelphusa cunicularis*. Prawns and crabs are fragile crustaceans which are generally relished as an article of food. Hence, these crustaceans were selected for the present probe. The thesis was divided into five chapters.

The first chapter embodies the information of the gross morphology, histology and histochemistry of the mandibular organ in the freshwater prawn and crab. This view of study indicates the inaccurate classical picture of the mandibular organ cells in both the prawn and crab. A comparison has been made.

The second chapter comprises of the histological changes of the mandibular organ during the various stages of the molt cycle in both the
prawn and crab. It was aimed to evaluate the role of mandibular organ in inducing molting. Distinguished light microscopical analysis was carried out.

The third chapter constitutes the histological changes of the mandibular organ after eyestalk ablation in the crab as well as prawn. Here, an attempt was made to investigate the effect of bilateral extirpation of eyestalks in the mandibular organ. It shows the affinity between eyestalk and the mandibular organ. Several important perceptions gleaned from the literature.

The fourth chapter concerns the mandibular organ cycle in relation to reproductive cycle. This contemplation was undertaken with a view to study the correlation of the mandibular organ of the male and female prawn and crab at various stages of their life cycle. The possible significance of the findings were presented and discussed.

The fifth chapter includes the effect of implantation of mandibular organ on the immature male and female on gametogenesis in the prawn and
crab. This experiment was performed to clarify the role of mandibular organ in stimulating the production of yolk material, whose accumulation triggers a series of events culminating in vitellogenesis accompanied with spermatogenesis and that they perhaps also have roles in the regulation of crustacean morphogenesis and metamorphosis.

It was therefore concluded with a list of references. Expecting that this current investigation will be an appreciation and may be an indicative for the basis in paving way for further discoveries on the crustacean mandibular organ.