SYNOPSIS OF THE PH.D., THESIS ENTITLED

STUDIES ON THE GROWTH AND SURVIVAL OF HATCHERY REARED LARVAE OF GIANT FRESHWATER PRAWN, MACROBRACHIUM ROSENBERGII (DE MAN, 1879) WITH BETTER MANAGEMENT PRACTICES

BY

M. SHAILENDER M. Sc., M. Phil.

UNDER THE GUIDENCE OF

Dr. P.V. KRISHNA M. Sc., M. Phil., Ph.D.

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The giant freshwater prawn, *Macrobrachium rosenbergii* (de man, 1879) is commercially one of the most important crustaceans, species in several countries both as a food item for local consumption as well as high export value. It is becoming increasingly popular in India, particularly in the coastal states, where it has become a significant culture fishery. The reason for the majority of the farmers in coastal states, having faced severe disease outbreaks in shrimp farming, switched over to freshwater prawn farming. Under controlled culture in freshwater and low saline ponds in inland as well as coastal area, it grows fastest among all freshwater prawns. It shows a wide range of temperature and salinity tolerance, acceptance of a wide range of formulated diets, culture compatibility with non-predaceous species of fish, and it has short larval period. The fresh water prawn is a good candidate species for polyculture with surface and column feeding carps. Integration of prawn culture with carp production is another culture practice followed in India when freshwater prawn advanced post larvae were stocked tighter with larvae of catla, rohu and other carps.

However, a major constraint in the large scale aquaculture of this species is the adequate supply of seed at required quantities and in all locations where the majority of seed used in grow out farming comes from hatcheries. Existing hatcheries are not producing up to their installed capacity due to various reasons. Availability of healthy and high quality larvae has always been a major obstacle in the expansion of *M. rosenbergii* culture. The low yield and mortality of hatchery reared seed may be affected by several factors such as poor reproductive performance of brood stock, polluted water and imbalanced feed.

The present study was undertaken to improve better management practices for scampi seed production though investing a number of factors that play an important role in success of larval rearing. These include embryonic development, hatching and larval development, broodstock stock, larval stocking densities, larval feeds and
feeding ratio, *Artemia* replacement diets, larval culture techniques, efficiency of probiotics and diseases management as a tool to control pathogens in prawn larval rearing.

The thesis is presented in twelve chapters.

**Chapter-1**: Deals with the *introduction* of aquaculture, status of scampi culture and its importance in India and world fisheries.

**Chapter-2**: To emphases the present status of giant freshwater prawn farming, seed production and hatchery management to pinpoint for various factors through better management practices. **Review** of previous studies on broodstock rearing, larval rearing techniques and nutritional aspects, disease management and use of probiotics as a tool to control diseases in scampi seed production.

**Chapter-3**: The present the *material and methods* employed in the present study of hatchery performance with reference to the larval survival, growth, disease management and water quality parameters in the hatchery for successful seed production.

**Chapter-4**: Deals with the complete life cycle of *Macrobrachium rosenbergii*. Detailed experiments on *egg incubation, hatching and larval development* conducted in the freshwater prawn hatchery, Kakati Aqua Tech Ltd. Related aspects in this regard are the influence of salinity and temperature on the embryonic development, hatching and larval development.

**Chapter-5**: To emphases the present study on *reproductive performance* and offspring quality of *M. rosenbergii* broodstock from four different stocks were compared with the objective to determine which broodstock source is better suited for seed production under different conditions prevailing in scampi farming areas in India.

**Chapter-6**: Deals with the effects of *larval stocking density* on larval survival and feeding ratio on larval growth, duration of the larval rearing cycle and larval quality of *M. rosenbergii*. The purpose of this study was to optimize larval stocking densities
and feeding ratio which reduces production cost, but also maximizes productivity of the hatchery.

Chapter-7: To discuss the use of supplementary feeds and the replacement rate of live feed for successful larval production. Accordingly, a series of experiments were conducted to evaluate the use of formulated larval diets to supplement or replace *Artemia* nauplii partially or completely in freshwater prawn larval rearing.

Chapter-8: Present the experiments carried out the post larval production of *M. rosenbergii* by using different feed combination in order to reduce the production cost, and increase the productivity of the hatchery.

Chapter-9: To investigate the larval development of *M. rosenbergii* with different culture systems. Further, larval performance was observed in clear water system and green water systems.

Chapter-10: Deals with the effect of probiotics on the survival of post larvae of the giant freshwater prawn *Macrobrachium rosenbergii* and on the micro-biota (total bacteria and *vibrio* spp.) associated with the larvae and post larvae in the hatcheries. The results are presented with the application of probiotics, and to find out its affect in controlling the harmful bacteria in water.

Chapter-11: Presents various diseases affecting the larvae during larval rearing cycle and their control using the application of different antibiotics and chemicals to reduce the diseases caused by bacterial, fungal and protozoan’s associated with larvae and post larvae in the hatcheries.

Chapter-12: Presents general discussion, summary and conclusion carried out on the better management practices of hatchery conditions for scampi, *M. rosenbergii* under ambient conditions in India.

Finally references were placed.