

M.S.91. SARASU, T.N.—Larval biology of spiny lobsters of genus *Panulirus*—1988—Dr. M.J. George.

The spiny lobsters with their ever increasing demand as a delicacy all over the world have great importance in the commercial fishery. Through the export of products from this valuable Crustacean, a considerable amount of foreign exchange is earned by our country. The export oriented industry of frozen lobster tail production in India wholly depends on the commercial exploitation of the spiny lobsters occurring along Indian coasts, the important species exploited being *Panulirus homarus*, *P. polyphagus*, *P. ornatus* and *P. versicolor*.

In recent years considerable decline in the total production of these lobsters have been noticed indicating necessity for measures of conservation of fishery. One way of augmenting production is through artificial culture of the spiny lobster. This has attracted attention of researchers all over the world and various attempts have been and are being made to culture the spiny lobsters through all the larval stages in the laboratory. However, so far attempts to rear commercially important spiny lobsters from egg through all the phyllosoma stages and subsequent commercial culture have not been successful. To a large extent

knowledge about the biology of the phyllosoma larvae remains to be revealed in order to make commercial culture possible. Development of culture systems largely depends on evolving an efficient technology for commercial rearing of the larvae.

Knowledge about the phyllosoma larvae of spiny lobsters of India is mostly limited to larval samples from nature through plankton collections. A few attempts have also been made by some authors to rear the larvae in the very early stages. Therefore the Indian spiny lobster *Panulirus homarus* was selected to study the larval biology by hatching the eggs in the laboratory and subsequent rearing of the phyllosoma larvae through the stages and also by conducting experiments to determine optimum conditions of environment to minimise larval mortality and ensure successful growth and moulting of the larvae. Phyllosoma larvae of different species sorted out from plankton samples collected during research cruises were also studied.

Fully alive berried specimens of the lobster *Panulirus homarus* for hatching and rearing experiments were collected from Kayalpattinam near Tuticorim during January 1984 to June 1986. The phyllosoma larval samples for analyses were obtained from the zooplankton samples collected during cruises of the Fishery & Oceanographic Research Vessel Sagar Sampada of the Department of Ocean Development, conducted off Indian coasts in 1985.

A brief review of the literature on biology, taxonomy and other features of spiny lobsters especially with reference to larval biology, phyllosoma larvae and culture has been presented.

By keeping live berried specimens in brood tanks in the laboratory successful hatching of the eggs were obtained several times. Experiments conducted on rearing the larvae giving *Artemia* nauplii and jellyfish as food and the different stages obtained are described. In spite of several attempts to rear the larvae through successive moults only 4 stages were obtained in the laboratory and these stages are described in detail. One important observation requiring mention is that more than one moult occurs between two stages.

The presence of the naupliosoma in the life history of *P. homarus* was confirmed, although it was observed that there is no moulting from this to the 1st stage.

Another result worthy of mention is the fact that *Sagita* and jellyfishes are acceptable to the phyllosoma larvae as food in addition to *Artemia* nauplii. It was also noticed that the major cause of the larval mortality was the lack of suitable food for different larval stages.

Experiments conducted to determine the influence of Salinity, pH, temperature and dissolved oxygen on the survival and moulting of the larvae in the laboratory yielded useful results. Statistical analysis of results obtained by rearing batches of phyllosoma 1st stage, larvae in sea water of different grades of salinity, pH, temperature and dissolved oxygen in triplicate experiments showed that the optimum salinity, pH, temperature and dissolved oxygen to be in the range of 28 to 30 ppt, 8 to 8.6, 31°C and 4ml/ltr. respectively.

Taxonomic studies on the phyllosoma larvae collected from the plankton indicated occurrence of different stages of larvae *P. homarus*, *P. versicolor*, *P. penicillatus*, *P. longipes*, *P. polyphagus* and *P. ornatus* in the samples analysed. The stages are described with full details and figures in the thesis.