A NOTE ON LARVAL REARING OF THE EDIBLE CRAB, *PORTUNUS PELAGICUS* LINNAEUS, AT ENNORE HATCHERY, MADRAS

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ABSTRACT

The results of an experiment on hatchery rearing of the blue swimming crab, *Portunus pelagicus*, from berry to second instar stage, conducted at the Ennore hatchery of the CIFR Institute, are reported.

Increasing demand for crabs in the domestic and foreign markets make them a much sought-after item among fishery products. Even if the level of exploitation was stepped up, the resultant landings might not fully satisfy the demands. Hence, the need for developing culture methods is obvious, for which the necessary seed material has to be raised in hatcheries, as the seed available in nature may not be sufficient.

Except for the descriptions of the larvae of *Portunus pelagicus* (Prasad and Tampi 1952) obtained from plankton collection and from laboratory rearing (Naidu 1953), no concerted effort on rearing crabs has so far been reported from our country. Hence attempts at breeding and larval rearing of crabs were made at the newly established hatchery of the Central Inland Fisheries Research Institute at Ennore. In this note the results of the first successful breeding and rearing of larvae of the blue swimming crab, *P. pelagicus*, through the entire cycle up to the 3rd instar stage are reported.

The Ennore hatchery is located about 1 km west of the bar mouth, which is kept perennially open by continuous dredging by the Tamil Nadu Electricity Board for the Ennore Thermal Station. The hatchery has an *in situ* filter for supplying filtered estuarine water, air compressors for continuous aeration, plastic pools for breeding and larval rearing, large reservoir tanks for storing water and a generator as a stand by during power failures.

An ovigerous *P. pelagicus* (150 x 60 mm; 150 g) collected from a marine catch off Ennore on 30-9-1984 was kept in a plastic pool (400 l capacity)

with well-aerated, filtered brackishwater. Chopped pieces of green mussel (*Perna viridis*) and trash fish were given as feed. As a prophylactic measure, the water was treated with Chloramphenicol (1 ppm). After 6-7 days of incubation, about 20% of the eggs in the berry hatched out into first zoeal stage. Their number was estimated to be about 36,000. The zoeae were active, and so further rearing was taken up after removing the mother crab and removing all the bottom debris, which was consisting mainly of unhatched eggs, egg shells etc. The larvae were evenly distributed in plastic pools at an average rate of 20|l. The larval stages were fed every 6 h as follows: The first zoeal stage was fed on *Tetraselmis* sp. cultured in the hatchery (10,000 cells|ml) and egg custard suspension (0.1 g|1000 larvae). For the second zoeal stage, in addition to the above items the rotifer *Brachionus plicatilis* (100 nos|ml) cultured in the hatchery was also given. The third zoeal stage was fed on a mixture of egg custard and green mussel tissue suspension (1:1) @ 0.2 g|100 larvae. Minute particles of green mussel and trash-fish flesh (1:1) were given to the megalopal stage. Water qualities were regularly monitored. The exuviae,dead larvae and the leftover feed at the bottom of the rearing pools were siphoned out every morning. About 50-80% of the water was replaced daily.

In the present study, the different larval stages were found to conform to the description given by Prasad and Tambi (1952). After 5 days, the first zoea moulted into the second zoea, which, after a further period of 5 days, attained the third zoael stage. The number steadily dwindled to 10,000 and 2,850 at the 2nd and 3rd zoeal stages, respectively. The third zoea metamorphosed into megalopa after a further period of 5 days. They were estimated at 1,020. The megalopae moulted twice, after 5 and 10 days, respectively, to give forth the 1st and 2nd postlarval instars. The survival rates, feeding schedule and water qualifies at different larval stages are given in Table 1.

Earlier workers had used brine shrimp nauplii as feed for rearing crab larvae (Bookhout and John Costlaw 1974, Chow 1978, Ong 1964). Though they are reported to be nutritious (Gallagher and Brown 1975), scarcity and high cost restrict their use in large-scale hatchery operations. As an alternative, in the present study, *B. plicatilis*, an equally nutritious (Charles John Bhasker 1952) and easily culturable live feed, was used for rearing the second zoeal stage. Similarly, *Tetraselmis* sp. (Parson et al 1961) cultured in the hatchery and easily available feeds such as egg (Chow 1978) and mussel in suspension were given for the first larval stage.

It has been shown that the density of shrimp larvae while rearing would depend upon many factors, of which food, temperature and salinity are the most important (Cook and Murphy 1969). The sudden fall in salinity in the estuary (33.4 to 8.0 ppt) during the rearing period necessitated a prolonged use of the same water, without having it replaced, which might be one of the reasons for the heavy mortality of early larval stages. Again at the megalopal stage

TABLE 1. *Survival rate, feeding regime and water qualities at different larval stages of* P. pelagicus.

Date	Larval stages	Estimated No. of larvae	Percentage survival over the survival stages.	Feeding Schedule	Water quality		
					Temp. °C	Salinity ppt	D.O. ppm
6-10-1984	I Zoea	36,000		1. *Tetraselmis* sp. 10,000 cells/ml.	25.8-	25.0-	5.0-
				2. Egg custard suspension 0.1g/ 1000 larvae	27.3	33.4	5.4
11-10-1984	II Zoea	10,000	27.7	1. Egg custard suspension 0.1 g/ 1000 larvae	26.0-	27.0-	4.8-
				2. *Tetraselmis* 10,000 cells/ml	29.2	30.0	5.2
				3. *Brachionus plicatilis* 100 Nos/ ml.			
16-10-1984	III Zoea	2,850	28.5	Egg & Mussel tissue 0.2 g/1000 suspension mixture larvae	23.0- 30.0	22.0- 28.0	5.2- 5.4
21-10-1984	Megalopa	1,020	35.7	Minute particles of green mussel and trash fish flesh	27.9- 28.8	24.2- 28.2	5.0- 7.0

mortality occurred, which was mainly due to cannibalistic tendency of the larvae and, possibly, due to unsuitability of the feed provided.

A hatchery with *in situ* filteration and aeration systems, constant monitoring of water qualities and provision of selective larval feed have led to the present success in the larval rearing, which is a significant achievement in the direction of seed production. However, further studies are necessary to standardise the methods.

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