LARVAL REARING OF THE CRAB *PORTUNUS PELAGICUS* (CRUSTACEA, PORTUNIDAE) IN HATCHERY AT MANDAPAM REGIONAL CENTRE OF CMFRI

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The blue swimmer crab *Portunus pelagicus* (Herbst) supports a good fishery in the Palk Bay and the Gulf of Mannar and forms the major species of crab caught in trawl nets. On an average it fetches Rs. 35-40/kg and in some seasons it goes upto Rs. 55/kg. This species is getting more market demand nowadays.

Shrimp culture has been the major attraction of aquaculturists for some time. But during the recent years they encountered heavy loss due to disease outbreaks in shrimp farms. Therefore it has become necessary to diversify the culture operations and to restrict the over emphasis given to shrimp culture. Considering the high export value, this crab is a good candidate species for aquaculture and for rotation of the crop.

The nonavailability of crab seed is the main constraint in crab culture at present. The farmers are completely dependent on natural resources for seed and juvenile crabs. Larval rearing and seed production of *Scylla serrata* has been demonstrated by several workers. But hatchery production of *Portunus pelagicus* has not been undertaken in our country. So work was taken up to standardise and popularise a technology for the hatchery production of seed of *P. pelagicus* with a view to overcome the non-availability of crab juveniles for farming and also to replenish the depleting stock of the wild by sea-ranching (by releasing the laboratory reared young ones into the sea) which would help a sustainable fishery of crab in the region.

Broodstock

Healthy ovigerous females of *P. pelagicus* were collected from trawler catches off Mandapam and were brought to the hatchery. Crabs with characteristic yellow coloured eggs were kept in 1.5 t tanks (5 nos.) at salinity 25 ± 1 ppt, pH 8.2 ± 0.1, temperature 28 ±1°C, with continuous aeration. Daily 60-70% of water was exchanged in the morning and evening hours. Only filtered seawater was used for the entire operations. Crabs were fed with fish and clam meat. After a few hours the left out feed was removed to avoid fouling of water.

Spawning

Changes in the egg colour was observed daily and when the egg mass became deep grey in colour the animals were transferred into separate tanks with known volume of seawater

for spawning. The total weight and carapace width were noted. At this stage crabs were not given any feed. Tank was cleaned daily.

Larvae

Larvae were counted by taking different samples and stocked in fibreglass tanks with different stocking densities. Water quality parameters such as temperature, pH and salinity were determined daily. Other parameters viz. nitrate, ammonia, phosphate and H_2S were measured twice a week. Good aeration was provided in each tank with an air compressor.

Larval feed

Larvae (zoeae) were fed with mixed phytoplankton with *Chaetoceros* spp. (dominating) and *Chlorella*, rotifier and freshly hatched *Artemia* nauplii. The megalopae were fed with macerated shrimp in addition to rotifer, shrimp nauplii (of *P. semisulcatus*) and *Artemia* nauplii. Crab instars were fed with shrimp, clam meat and shrimp post larvae.

The rearing tanks were observed daily for successive developmental stages, moulting larvae and exuviae. Seventy five per cent of the water was exchanged in the morning and evening hours.

When the larvae reached zoea-V stage different substrata were provided in the tank. Nylon ropes, edible oyster shells, sea grass, polypropylene fishing nets, asbestos sheets and PVC pipes were placed in the tanks as the megalopa stage requires substratum for its attachment. When the megalopae metamorphosed into first crab stage, they were transferred into a new tank with similar water quality parameters.

Mixed phytoplankton, rotifers, shrimp nauplii and *Artemia* nauplii were raised according to the hatchery requirements for feeding. Filtered seawater was used for these cultures.

Observations

The berried crab showed only occasional swimming behaviour in the tank by means of fifth pair of legs, but often it stood on pereopods with the egg mass held above the substratum. Total incubation days varied between 10-12 days. The larvae hatched out during the early morning hours and the number of total zoeae hatched out varied according to the size of the mother crab (2-14 lakhs in the present experiments). In all the cases 100% hatching was observed.

There were five zoea stages, passing through five moults to reach the megalopa stage, which metamorphosed into first crab stage. Zoea phase (Z1-Z5) took 12-13 days to metamorphose into megalopa, each zoea stage taking a minimum period of 2-3 days before it moulted into the next stage.

The zoeae were photopositive, swimming towards the source of light. All the zoea stages were observed to be active swimmers and found aggregating into groups very often along the sides of the tanks near the surface.

Megalopae which were less active than zoeae took 6-7 days to reach the crab stage. They swam by means of pleopods. Megalopae more often rest at the bottom or cling to the substrata provided in the tank. Among the different materials tested as substrata for the megalopal attachment, asbestos sheets and polypropylene nets were preferred most by them. Moreover, nets were easy to clean and did not affect the water quality of the rearing tank. The chelipeds were used to collect the food particles or to catch the swimming prey. Cannibalistic nature of megalopae was very much evident.

Mortality was less till the larvae reached zoea-V stage and the rate of survival was 80-85%. Increased mortality was observed when the zoea-V moulted into megalopa stage. At this stage tanks with a stocking density below 10,000 larvae/t showed comparatively better survival rate. Mortality was also observed while the megalopae moulted to juvenile crabs. Profound cannibalism was observed among the juvenile crabs also, though they were supplied with shrimp meat, mussel meat and postlarvae of *Penaeus semisulcatus* as feed.