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**THE MARINE FISHERIES INFORMATION SERVICE:** Technical and Extension Series envisages the rapid dissemination of information on marine and brackish water fishery resources and allied data available with the National Marine Living Resources Data Centre (NMLRDC) and the Research Divisions of the Institute, results of proven researches for transfer of technology to the fish farmers and industry and of other relevant information needed for Research and Development efforts in the marine fisheries sector.

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## LARVAL REARING AND SPAT SETTLEMENT OF BROWN MUSSEL *PERNA INDICA* IN THE LABORATORY\*

Earlier work at the Central Marine Fisheries Research Institute has proved the great potential for mussel farming in the coastal waters of India. The brown mussel *Perna indica* is one of the two species occurring in India, but with a narrow distribution along the extreme south-west coast. The inadequacy of mussel seed in the wild is one of the constraints for taking up commercial mussel farming. Initial success has been achieved in the artificial breeding of the brown mussel and spat have been raised in the laboratory.

Spawning in this species commences from May and lasts till August, with a peak during June-July. Induced spawning in the laboratory in June was achieved by thermal stimulation by keeping mature animals at 31°-34°C. Sudden change in temperature induced spawning at 34°C. But the eggs developed only upto veliger

stage and were not healthy. In July, the mussels spawned in the tanks naturally without any external stimuli. Males spawned first. The milt was expelled in a jet. The eggs were liberated usually in two or three spells, at intervals ranging from 30 minutes to 3 hours. The eggs were spherical and brick red in colour and measured 45-60  $\mu$ . The milt was mixed with the eggs kept in beakers with filtered sea water and fertilization took place immediately.

Trochophore larvae were noticed within 7 hours after fertilization. Within 20 hours early veliger stage was observed in the larval rearing tanks and the larvae were D-shaped within 24 hours (Fig. 1). The larvae measured 70-76  $\mu$  in the antero-posterior axis and 62 to 65  $\mu$  in dorso-ventral axis. Early umbo stage was observed from 7th day onwards (Fig. 2). Late umbo stages

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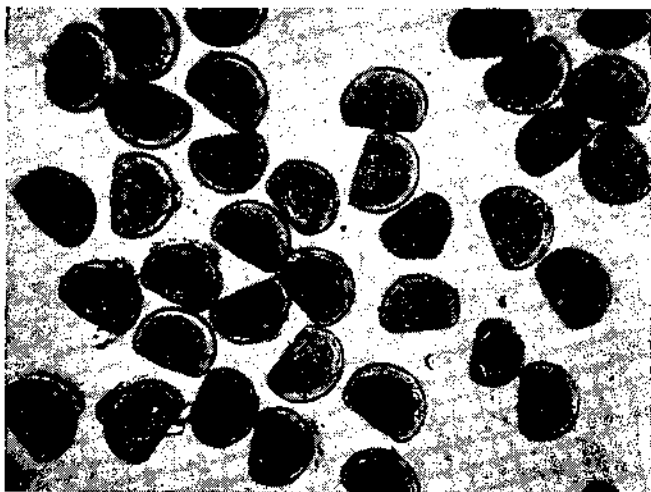


Fig. 1. D-shaped veliger larvae of *Perna indica*

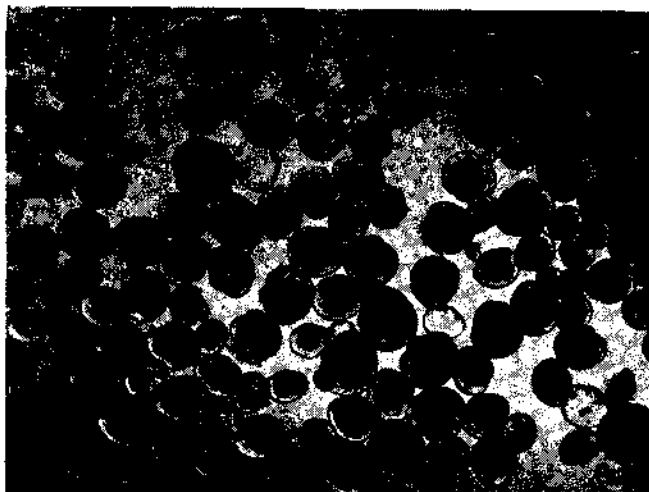


Fig. 2. Umbo larvae of *P. indica*

were noticed from 9th day and larvae measured  $200\ \mu$  in the antero-posterior axis. The larvae showed a thick greenish yellow digestive gland in the antero-dorsal region visible through the transparent shell. Larvae reached eyed stage by 13th day with a characteristic dark pigmented eye spot ventral to the digestive gland. The valves were more convex with concentric striation and the antero-posterior axis measured  $208$  to  $261\ \mu$  and dorso-ventral axis  $200$  to  $260\ \mu$ . From 16th day onwards pediveliger stages were found in the rearing tanks. This stage was characterised by the slightly oblique valves, protruding foot and reduced velum. Shell became thick and brown colouration started appearing in the valves. On 17th day the largest pediveliger measured  $489\ \mu$  in the antero-posterior axis and  $437\ \mu$  in the dorso-ventral axis. The larvae crept at the bottom of the tanks with the help of foot and aggregated near the points of aeration. The velum had disappeared totally and the larvae started settling on clutches viz., nylon monofilament, plastic sheets, granite pebbles, mussel shells and glass plates by 21st day. The spat have attained characteristic shape and brown colour of the adult (Fig. 3). Good settlement of spat was observed in the bottom of the rearing tanks also. The maximum length of spat observed on 21st day was  $780\ \mu$ . By 32nd day the maximum size of the spat in the rearing tanks was  $2.7\ \text{mm}$ .

For larval rearing sea water filtered through  $40\ \mu$  bolting silk was used. Fibre glass tanks of  $50\ \text{l}$  capacity were used as rearing vessels and sea water was changed once daily and aerated well. The larval density was  $10,000$ – $15,000$  per litre upto 5th day and became reduced to  $5,000$ – $6,000$  per litre afterwards. Feeding of larvae with micro algae *Isochrysis galbana* and *Pavlova* sp. was



Fig. 3. Young spat of *P. indica* settled on monofilament.

started from the straight-hinge veliger stage. The total cell count per microlitre varied from  $71$  to  $120$  cells. The quantity of algae fed was increased gradually as the larvae grew to umbo, eye spot and pediveliger stages. Phytoplankton, with additional inoculation of *Isochrysis*, cultured in open tanks was given for the spat from 29th day onwards. Further research has been taken up to standardise water quality, larval density and food concentration to achieve maximum settlement and survival.

