

ON THE SPAWNING AND REARING OF *PENAEUS INDICUS* IN THE  
LABORATORY WITH A NOTE ON THE EGGS AND LARVAE

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ABSTRACT

*Penaeus indicus* has spawned in the laboratory and the larval stages reared for the first time in India. The salient features of the eggs and larvae are reported.

Research at the prawn-culture laboratory of the Central Marine Fisheries Research Institute at Narakkal has resulted in the successful spawning and mass culturing of the eggs and larvae of the commercially important species of penaeid prawns (viz., *Penaeus indicus*, *Metapenaeus dobsoni*, *M. affinis*, *M. monoceros* and *Parapenaeopsis stylifera*) to the post-larval stage under controlled laboratory conditions. Although descriptions of some larval stages of *Penaeus indicus* have been made, (Menon 1937, Rao 1973 and Subrahmanyam 1965), they were based on specimens sorted out from the plankton and were assigned to *P. indicus* purely on circumstantial evidence. The present experiments, where mature specimens of *P. indicus* were allowed to spawn in the laboratory, gave us an opportunity to describe the complete series of embryonic and larval stages of this very important commercial species. It was immediately apparent that the larval features of *P. indicus* were clearly different from the earlier descriptions. The salient findings are reported in this note. The detailed description of the complete series of larval stages is being published elsewhere.

*P. indicus* spawned in the prawn-culture laboratory on 5th, 10th, 15th and 26th February 1976. Mature female prawns collected from the sea off Cochin in the 20-25 metre depth zone were brought alive to the laboratory and kept in 50-litre plastic basins containing filtered sea water. The water was aerated through air stones. The spawners ranged in size from 132 mm to 175 mm. The temperature during the experiments varied from 24.4°C to 26.8°C and the salinity from 33.86‰ to 34.10‰. Continuous observations were made till the larvae transformed into post-larvae. The developing larvae from the culture tanks were preserved in 10% buffered formalin.

The nauplius larvae emerged from the egg 16-17 h after spawning. 6 naupliar, 3 protozoal and 3 mysis stages were recognised. The duration of each stage is given below:

Embryonal stage	:	16-17 h
Nauplius I to Protozoa I	:	35-55 h
Protozoa I to II	:	24-48 h
Protozoa II to III	:	48-72 h
Protozoa III to Mysis I	:	24-48 h
Mysis I to II	:	48-72 h
Mysis II to III	:	24-48 h
Mysis III to post-larvae I	:	24-48 h

The earliest post-larval stage was observed 12 days after spawning. The diagnostic features of each stage are given below and the egg and some of the larval stages are illustrated (Fig. 1 & 2).

*Egg* (Fig. 1,a): 0.27 mm in diameter, narrow perivitelline space, chorion with a purplish sheen.

*Nauplius I* (Fig. 1, b & c): A pair of furcal spines curved dorsally, minute posterodorsal tooth, non plumose setae on appendages.

*Nauplius II*: A pair of furcal spines, plumose setae, posterodorsal tooth absent.

*Nauplius III*: 3+3 furcal spines.

*Nauplius IV*: 4+4 furcal spines.

*Nauplius V*: 6+6 furcal spines.

*Nauplius VI* (Fig. 1, d): 7+7 furcal spines.

*Protozoa I*: Eyes sessile, 7+7 furcal spines, outermost furcal spine dorsally disposed.

*Protozoa II*: Eyes stalked, prominent supraorbital spines bifurcate, 7+7 furcal spines.

*Protozoa III* (Fig. 1, e): Supraorbital spines not bifurcate, uropods developed, dorsal spines on 1st to 5th abdominal segments and posterolateral spines on 5th and 6th abdominal segments, 8+8 furcal spines.

*Mysis I*: Carapace with well developed supraorbital, hepatic and pterygostomi-an spines, rostrum without teeth, dorsal spines on 3rd to 6th abdominal segments, posterolateral spines on 5th and 6th abdominal segments, a pair of minute ventro-lateral spines and a prominent, hooked postero-median ventral spine on 6th abdominal segment, no pleopod buds present, 8+8 furcal spines.

*Mysis* II: Dorsal spine on 3rd abdominal segment disappears, other spines as in *mysis* I, plecopod buds present.

*Mysis* III (Fig. 2,a): Plecopod buds 2-segmented, rostrum still without teeth, spines as in *mysis* II, spines on 4th abdominal segment may be absent.

*Post-larva* I (Fig. 2,b): Rostrum with a single tooth; supraorbital spine still fairly prominent; pterygostomial spine minute; hepatic prominent; dorsal spines on 5th and 6th abdominal segments, sometimes also on the

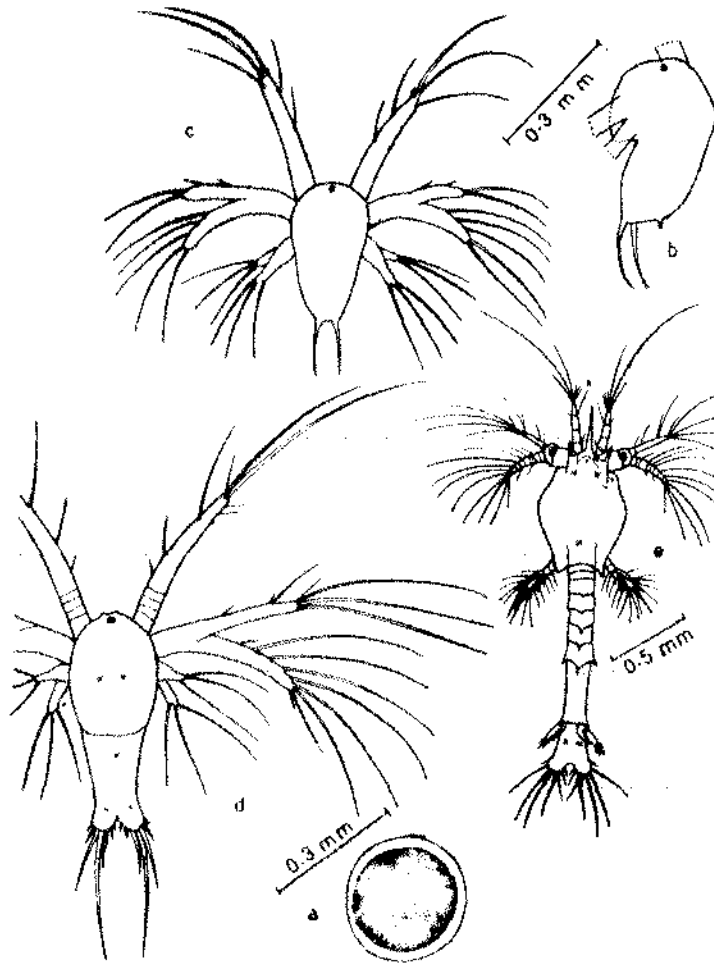


FIG. 1. Eggs and larvae of *Penaeus indicus*: a — egg; b — Nauplius I (lateral view); c — Nauplius I (dorsal view); d — Nauplius VI (dorsal view); e — Protozoa III (dorsal view).

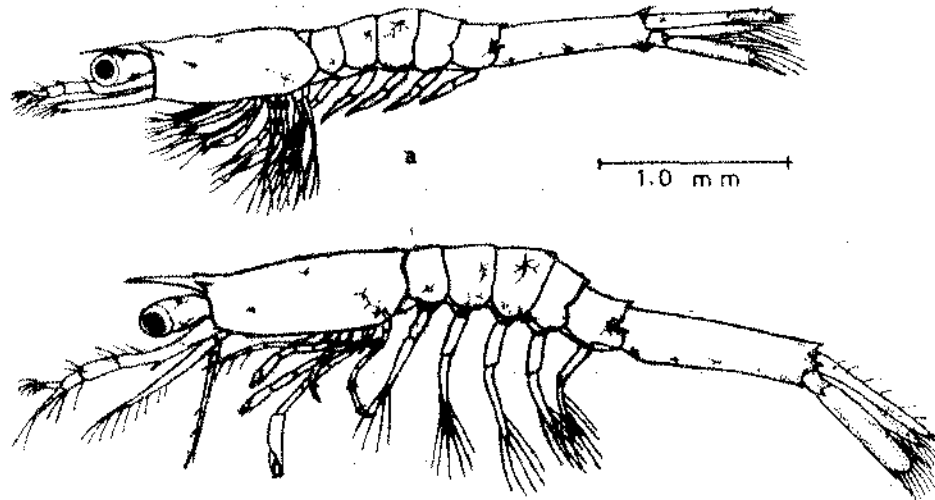


FIG. 2. a — Mysis III (lateral view); b — Post-larva I (lateral view).

4th; posterolateral spines on 5th and 6th abdominal segments, postero-median ventral spine still present on 6th abdominal segment; pleopods setose.

This is the first time that *P. indicus* has been cultured from egg to the post-larval stages in India. The techniques of getting *P. indicus* spawned in the laboratory and mass-culturing of eggs to post-larval stage are being perfected at the Narakkal Prawa Culture Laboratory of the Central Marine Fisheries Research Institute.

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