

## II

### Larval development — *PENAEUS MONODON* FABRICIUS

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*Penaeus monodon*, the giant tiger prawn, has spawned in the Narakkal Prawn Culture Laboratory of the CMFRI and larvae have been reared to the juvenile stage. At a rearing temperature of 26.5°C to 28.5°C the nauplii hatched out of the eggs 16-17 hours after spawning; the nauplius stage lasted 40-55 hours; the duration of protozoa stage was 4½-6 days and the mysis stage lasted for 3-6 days. The larva passed through 6 nauplius, 3 protozoa and 3 mysis substages before becoming postlarva I. The detailed structure of the larval substages is described and illustrated in this paper.

*Penaeus monodon*, the giant tiger prawn spawned in the Prawn Culture Laboratory at Narakkal and the larvae were reared up to juvenile stage. Although the larval history of this species has been studied by Villaluz et. al. (1969, *Philippine J. Sci.*, 98 (3-4): 205-233) at Philippines, the figures are not clear enough to show the details of setation. The object of this paper is to illustrate and describe in detail the morphological characters of the larval stages of this most important species of penaeid prawn, so that they can be readily compared with the other species of *Penaeus* already described. The rearing temperature was 26.5°C

to 28.5°C and the salinity of the water 30.2‰-33.5‰.

#### DESCRIPTION OF DEVELOPMENTAL STAGES EGGS

The eggs (Fig. 1.a) are small with a narrow perivitelline space. The egg diameter varied from 0.25 to 0.27 mm and the yolk mass 0.22 to 0.24 mm. The radiating jelly like substance seen in the case of *P. indicus* is also present in the freshly laid eggs of this species. The developing nauplius almost fills up the entire space inside the egg. The eggs hatched out 16-17 hours after spawning.

### NAUPLIUS I

MTL: 0.31 mm (0.29-0.32 mm); MW: 0.17 mm (0.17-0.18 mm); MFS: 0.12mm (0.10-0.13mm):

Furcal setae 1+1; minute posterodorsal tooth present; all setae non-plumose; A1 with 2 inner lateral setae distal one longer than proximal, 2 long setae and 1 minute setal rudiment terminally and 1 long seta on outer distal margin; A2 exopod bears 5 long setae along inner and distal margin, endopod with 2 short inner lateral setae and 2 long setae and a minute setal rudiment terminally; Md with 3 long distal setae on exo and endopods (Fig. 1. b). Duration of this substage was 3-4 hours.

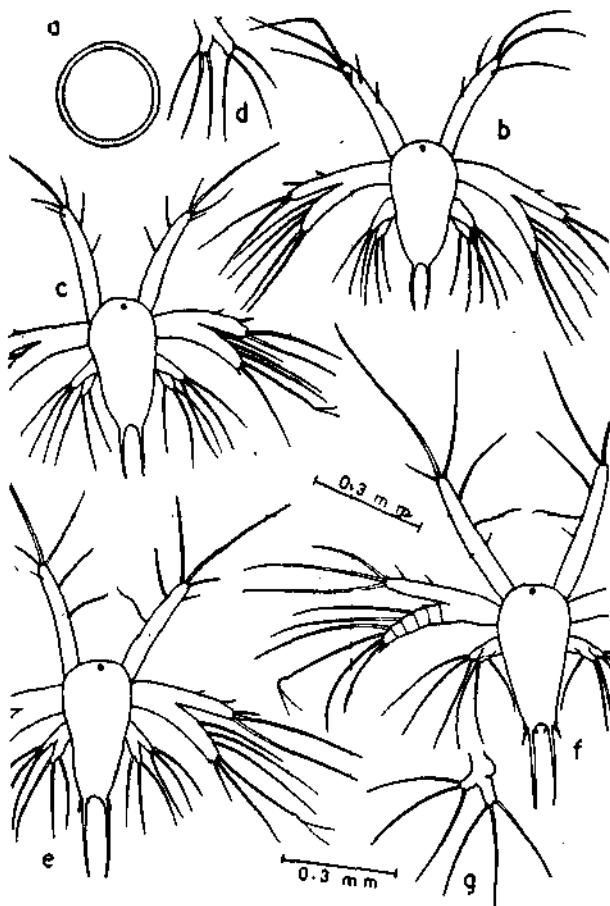


Fig. 1 *Penaeus monodon*: a - egg; b - nauplius I; c - nauplius II; d - Md of nauplius II; e - nauplius III; f - nauplius IV; g - Md of nauplius IV

### NAUPLIUS II

MTL: 0.32mm (0.31-0.32mm); MW: 0.17 mm (0.17-0.18mm); MFS: 0.14mm.

Furcal setae 1+1; posterodorsal tooth

absent; setae plumose; outer terminal and outer lateral setae of A1 shorter than in previous stage, setal rudiment has become a short seta; a setal rudiment added to distal outer angle of A2 exopod, the 4th seta from proximal end bifurcate distal to characteristic bend, this particular seta remains bifurcate in all subsequent nauplius substages (Fig. 1, c,d). Duration of this substage was 3-4 hours.

### NAUPLIUS III

MTL: 0.33mm (0.31-0.34 mm); MW: 0.17mm (0.17-0.18mm); MFS:0.18mm (0.17-0.20mm).

Furcal setae 3+3 (Fig.1,e); inner terminal setae of A1 longer than outer terminal seta, outer lateral seta very thin and short, a minute seta added proximal to 2 existing inner lateral setae, A2 exopod with 6 plumose setae and a setal rudiment, in endopod setal rudiment has grown into a short non-plumose seta. Duration of this substage was 4-5 hours.

### NAUPLIUS IV

MTL: 0.36 mm (0.34-0.36 mm); MW: 0.19 mm (0.18-0.21mm); MFS: 0.20mm (0.18-0.21mm).

Furcal setae 4+4 (Fig.1,f), frontal organs seen, outer distolateral seta of A1 lost, inner terminal seta longer; A2 exopod with faint segmentation, setal rudiment has become a short seta and another setal rudiment added terminally, a minute seta also added proximally on inner margin, in endopod inner terminal seta longer and plumose and another setal rudiment added terminally; base of Md swollen (Fig. 1,g). Duration of this substage was 5-6 hours.

### NAUPLIUS V

MTL: 0.39 mm (0.36 - 0.41 mm);MW:0.18mm; MFS: 0.25 mm (0.22 - 0.25 mm).

Furcal setae 6+6; A1 with minute seta added on outer lateral margin opposite to origin of long distal inner lateral seta, faint segmentation seen in proximal half; A2 exopod with outermost seta longer but still non-plumose (Fig.2,a). Duration of this substage was 10-12 hours.

## NAUPLIUS VI

MTL: 0.49 mm (0.46-0.53 mm); MW: 0.20 mm (0.18 - 0.20 mm); MFS: 0.30 mm (0.28 - 0.32 mm).

Furcal setae 7+7 (Fig.2, b), frontal organ prominent, carapace rudiment seen, 2 short setae added to outer distal margin of A1, these 2 setae and the short terminal seta appear to be aesthaetes, the middle one equidistant from other 2; A2 exopod with proximal setal rudiment of previous stage longer, another setal rudiment added proximal to it, a setal rudiment added on outer margin

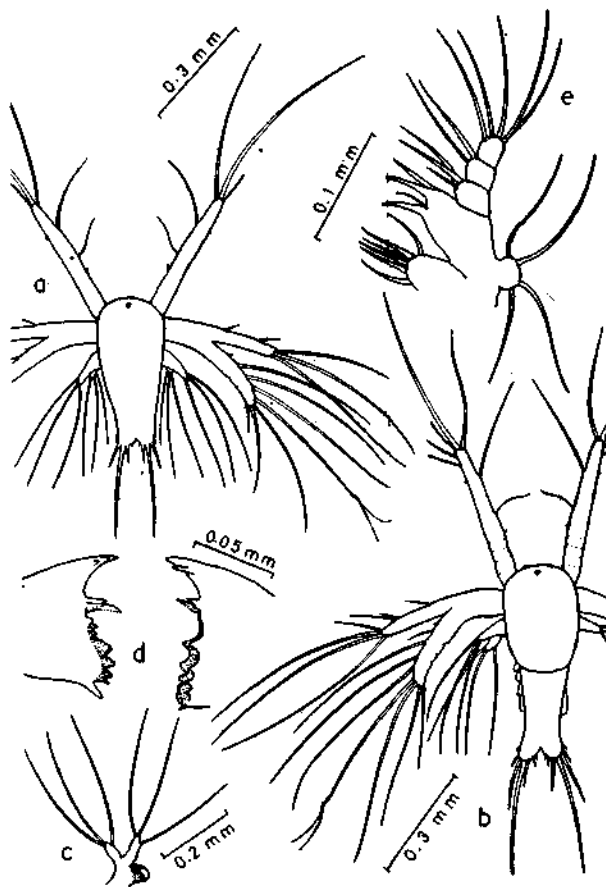


Fig. 2 *Penaeus monodon*: a - nauplius V; b - nauplius VI; c - Md of nauplius VI; Protozoa I; d - Md; e - Mx1

proximally, endopod with 4 terminal setae, 3 long and one short, a short seta added to base of distal inner lateral seta which has become longer; Md with basal swelling very prominent, cutting blade of Md seen

inside cuticle, exopod and endopod empty (Fig.2,c). Duration of this substage was 15-24 hours.

## PROTOZOEAE I

MTL: 1.06 mm (1.05 - 1.09 mm); MCL 0.47 mm (0.44 - 0.49 mm).

Frontal organs rounded; telson (Fig.3,a) with 7+7 setae, outermost pair dorsally disposed, 3rd pair from inner margin of furcal lobes characteristically sigmoid, furcal lobes broad and short with semicircular space between them.

A1 (Fig.3,a) with 3 main segments, proximal one subdivided into 5 subsegments, basal segment with 1 short inner seta, middle segment with 1 long and 1 medium inner lateral setae and 1 short outer lateral seta, distal segment terminally with 2 long setae, 1 short seta and 3 aesthaetes, 1 of which appears to be subterminal; A2 (Fig.3,a) with 9-10 segmented exopod bearing 11 setae along inner and distal margin and 2 short setae on outer margin, endopod 2 segmented, distal segment with 5 terminal setae, one of which is short, proximal segment has 3 inner lateral setae, 2 distal, 1 in middle and 1 at junction of endopod with protopod; Md (Fig.2,d) almost symmetrical with 1 free standing tooth between incisor and molar processes; Mx1 (Fig.2,e) protopod with 2 endites, distal with 1 slender and 3 stout setae and proximal with 6 setae, exopod with 4 feathery setae, endopod 3 segmented, distal segment with 5 long terminal setae, middle with 2 long setae and basal with 3 setae, 2 long and 1 short; Mx2 (Fig.3,b) protopod with 5 endites; basal endite with 6 setae and others with 3-4 setae, exopod with 5 feathery setae, endopod with 4 indistinct segments, distal with 3 long setae and rest with 2 lateral setae each; Mxp1 (Fig.3,c) protopod with 2 indistinct segments bearing numerous setae, endopod 4 segmented, 1st with 3 setae, 2nd with 1, 3rd with 2 and 4th with 5 setae, exopod unsegmented with 7 plumose setae; Mxp2 (Fig.3,d) protopod with 2 indistinct segments bearing 7 inner lateral setae, endopod indistinctly divided into 4 segments, 1st segment with 2 setae, 2nd with 1,

3rd with 2 setae and 4th with 5 setae, exopod with 6 setae; Mxp3 absent. Duration of this substage was 36-48 hours.

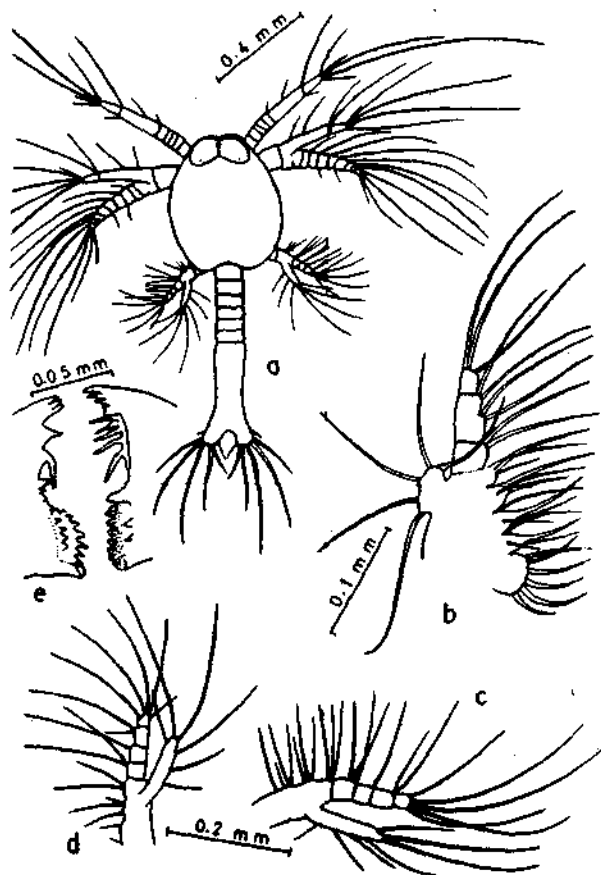


Fig. 3 *Penaeus monodon*: Protozoa I; a - dorsal view; b - Mx2; c - Mxp1 d - Mxp2; protozoa II; e - Md.

#### PROTOZOEIA II

MCL: 0.72 mm (0.70-0.77 mm); MTL: 1.06 mm (1.65-1.68 mm).

Carapace (Fig.4.a) with long ventrally bent rostrum and bifid supraorbital spines, telson with 7 pairs of furcal setae; A1 (Fig.4.a), one hair like seta added to middle segment on outer margin; A2 (Fig.4, a) setae have become longer; Md (Fig.3.c) asymmetrical, left with 5 free standing teeth and right with 1 free standing tooth, molar surface of right Md appears to have a concavity with the rim produced into a number of crenulate teeth, molar surface of left Md not concave but covered with number of toothed ridges and appears to

fit into the concavity on right Md; Mx1 (Fig.4,c) distal endite with 7 setae; no change in Mxp1 and Mxp2; Mxp3 absent. Duration of this substage was 36-48 hours.

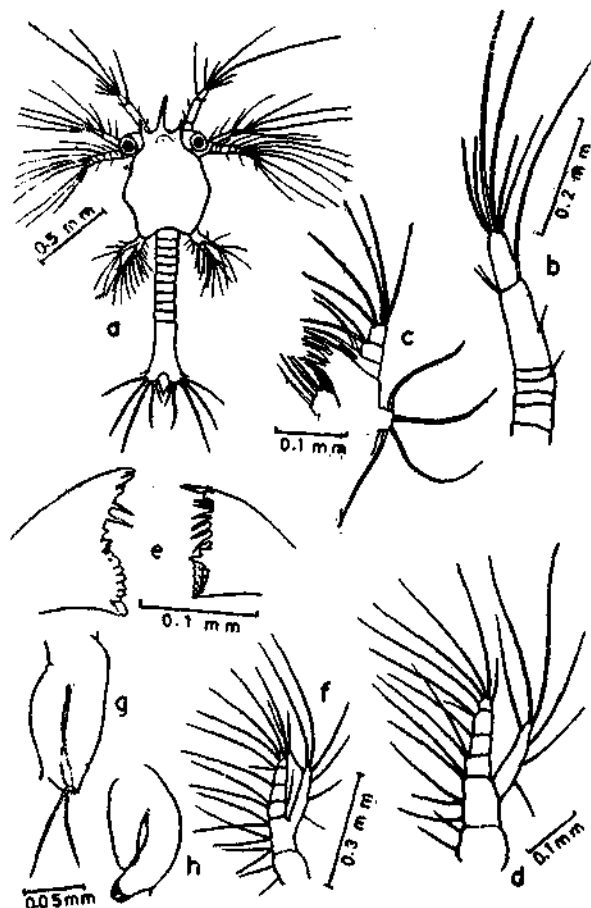


Fig. 4 *Penaeus monodon*: Protozoa II; a - dorsal view; b - A1; c - Mx1; d - Mxp1; Protozoa III: e - Md; f - Mxp2; g - Mxp3; h - bud of P.

#### PROTOZOEIA III

MCL: 0.79 mm (0.70-0.84 mm); MTL: 2.28 mm (2.14-2.38 mm).

Rostrum long, supraorbital simple, not bifid (Fig.5.a); abdominal segments (Fig.5.a) 1 to 5 with dorsomedian spine, 5th and 6th segments with posterolateral spines, 6th also has a pair of ventrolateral spines; biramous buds of Mxp3 (Fig.4.g) and P1 to P5 (Fig.4.h) present; uropods (Fig.5.c) present, exopod tipped with 6 setae and endopod with 2 setae; telson with 8 pairs of furcal setae.

A1 with 5 subsegments of basal segment fused into one unit; no change in A2; Md (Fig.

4,e) right Md with 2 and left with 6 free standing teeth; Mx1.(Fig.5,b) distal endite with 10 setae and proximal with 7 setae; Mx2(Fig. 5,c), more setae added to endites; Mxp1 (Fig.5,d) one inner lateral seta added to 2nd segment of endopod, exopod with 2 additional setae; Mxp2 (Fig.4,f), an outer lateral seta added to 1st segment of endopod, 1 more seta added to exopod; Mxp3 developed,

pterygostomial and hepatic spines present; abdominal segments 3-6 with dorsomedian spines, 5th and 6th with prominent postero-lateral spines, 6th with prominent posteroventral spines also, curved ventromedian spine present at junction of 6th abdominal segment with telson, minute pleopod buds on abdominal segments; telson (Fig.5,g) with 8+8 short stout setae, cleft deep reaching halfway between level of origin of 2 pairs of outer lateral setae.

A1 (Fig.6,b) 3 segmented, basal segment with anteromedian ventral spine, 2 setae above stylocerite rudiment, outer flagellum with 5

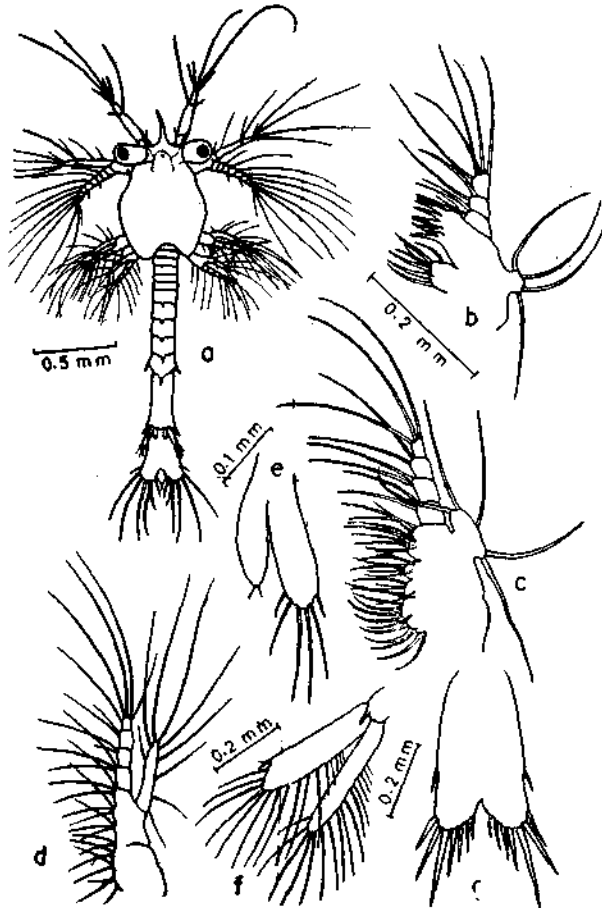


Fig. 5 *Penaeus monodon*: Protozoa III: a - dorsal view; - Mx1; c - Mx2; d - Mxp1; e - uropod. Mysis I: f - uropod; g - telson.

as biramous bud (Fig.4,g), endopod rudiment with 2-3 setae. Duration of this substage was 36-48 hours.

#### MYSIS I

MCL: 1.18 mm (1.14-1.23 mm); MTL: 3.79 mm (3.65 - 3.96 mm).

Carapace (Fig.6,a) with rostrum longer than eye, no rostral tooth, supraorbital,

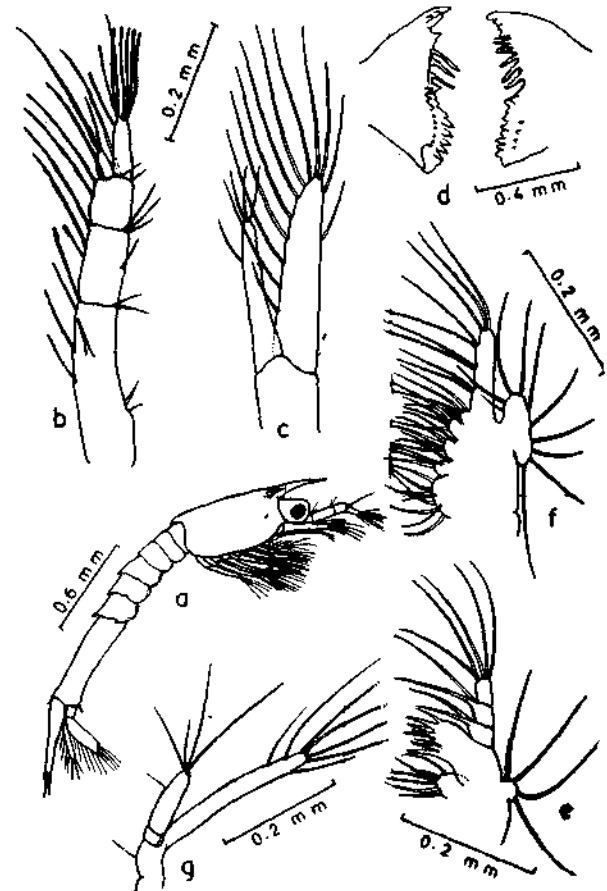


Fig. 6 *Penaeus monodon* Mysis I: a - lateral view; b - A1; c - A2; d - Md; e - Mx1; f - Mx2; g - P3

aesthaetes and 3 setae, inner flagellum minute with 2 setae, 1 long and 1 short; A2 (Fig.6,c), exopod unsegmented, fringed with 11 setae on inner and distal margin, and a plumose outer distolateral seta, endopod tipped with 3 short setae; Md (Fig.6,d), right with 3 and left with 7 free standing teeth, palp not seen; Mx1

(Fig.6.e) exopod retained; Mx2 (Fig.6.f) 10 setae on exopod; Mxp1 (Fig.7.a) exopod with 12 setae; Mxp2 (Fig.7.b) outer lateral setae added to 1st and 2nd segment of endopod; Mxp3 (Fig.7.c) well developed, with 5 segmented

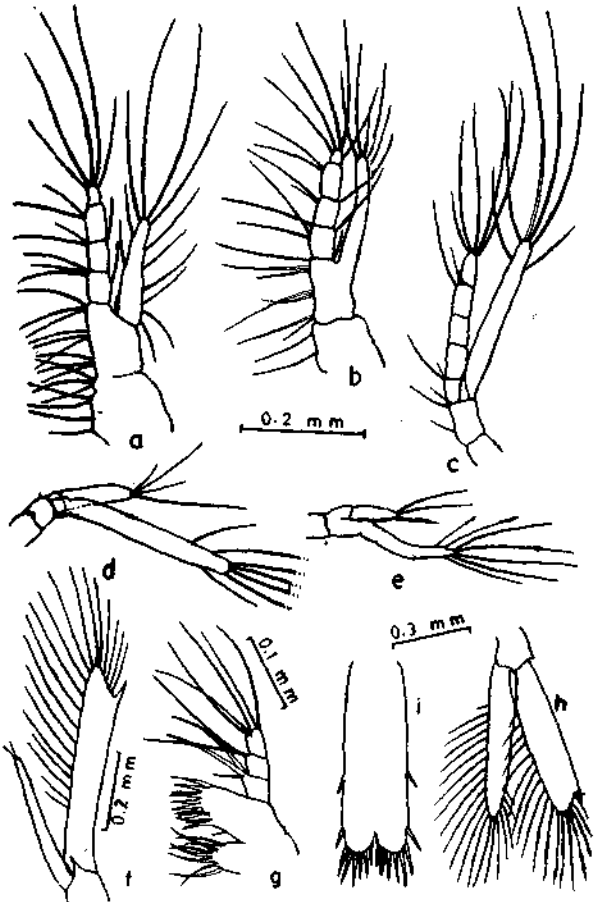


Fig. 7 *Penaeus monodon*: Mysis I: a - Mxp1; b - Mxp2; c - Mxp3; d - P1; e - P4. Mysis II: f - A2; g - Mx1; h - uropod; i - telson.

endopod, exopod tipped with 6 setae (1+4+1), some times 5 setae (0+4+1); P1 to P3 (Fig 7.d; 6.g) with endopod 2 segmented, with incipient chela, tipped with 4 long setae and one inner lateral seta, exopod with 7-8 setae (2+4+1 or 2+4+2); P4 and P5 (Fig.7,e) endopod tipped with 3 terminal setae, exopod with 7 or 8 setae; uropod (Fig.5,f), exopod with prominent distolateral spine followed by a short nonplumose seta shorter than distolateral spine and 16-17 long plumose setae; endopod with 16 long plumose setae. Duration of this substage was 24 to 48 hours.

**MYSIS II**

MCL:1.39 mm (1.34 to 1.47 mm) MTL: 4.16 mm (3.90-4.37 mm).

Rostrum usually without teeth, rarely a minute tooth may be present, no change in spination of carapace and abdomen (Fig.8.a), pleopods short, unsegmented; telson with cleft reaching to level of origin of penultimate pair of outer setae (Fig.7,i).

A1 (Fig.8, b) inner flagellum 3/4 length of outer; A2 exopod (Fig.7,f) with 19 plumose setae and a prominent distolateral spine, endopod unsegmented tipped with 2 short setae; Md (Fig.8,c) with 3 and 7 free standing teeth on right and left Md respectively, palp developed; Mx1 (Fig.7,g) without exopod, distal endite with 12 and proximal with 8 setae; Mx2 with 16 setae on exopod (Fig.8,d); Mxp1 (Fig.8,e) with

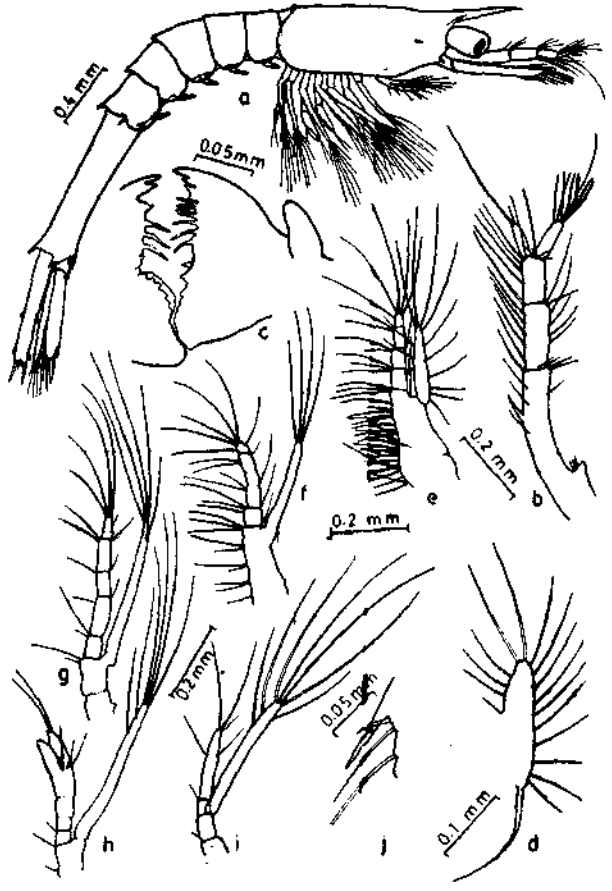


Fig. 8 *Penaeus monodon*: Mysis II: a - lateral view; b - A1; c - Md; d - Mx2 exopod; e - Mxp1; f - Mxp2; g - Mxp3; h - P1; i - P4; j - distolateral portion of exopod of uropod.

12 setae on exopod, rarely with 13 setae; Mxp2. (Fig.8,f) endopod with penultimate segment indistinctly divided into 2, distal segment with 6 setae, exopod with 4 terminal setae; Mxp3

(Fig.8,g) exopod with 0+4+1 or 1+4+1 setae; P1 to P3 (Fig.8,h) endopod 2 segmented, distal segment indistinctly divided into 3, chela developed with 2 terminal setae and 3 short setae at junction of dactylus with propodus, 1 short seta on inner margin of 1st segment, exopod with 1+4+2 or 2+4+2 long plumose setae; p4 and p5 (Fig.8,i) endopod 2 segmented, distal segment indistinctly divided into 2, tipped with 3 setae 1st segment with 1 short outer seta, 2nd with 1 outer seta and 1 inner; uropod (Fig.7,h), endopod with 20 plumose setae, exopod with 18 plumose setae and 1 nonplumose seta shorter than prominent distolateral spine (Fig.8,j) Duration of this substage was 24-48 hours.

### MYSIS III

MCL: 1.40mm (1.32-1.51 mm); MTL: 4.24mm (4.00-4.40mm).



Fig. 9 *Penaeus monodon*: Mysis III: a - lateral view; b - A1; c - A2; d - Md; e - Mx1; f - exopod of Mx2; g - Mxp1; h - Mxp2; i - Mxp3; k - P4; l - uropod; m - telson.

Rostrum with 1 tooth in some specimens, no change in spination of carapce and abdomen (Fig.9,a); pleopods long, 2 segmented without setae; cleft in telson reaching level of origin of 3rd pair of outer lateral setae on telson (fig.9,m).

A1 (Fig.9b) with flagella unsegmented, more or less equal in length, outer with 7 aesthaetes and 2 setae, inner with 3 apical setae; A2 (Fig.9,c) with 22-23 plumose setae and a prominent distolateral spine, endopod 2 segmented; Md (Fig.9,d) with palp longer, right and left Md with 3 and 7 free standing teeth respectively; Mx1 (Fig.9,e) with 13 setae on distal endite; Mx2 with 22 setae on exopod (Fig.9,f); Mxp1 (Fig.9,g) with gill rudiment on protopod, exopod with 12, rarely 13 setae; Mxp2 (Fig.9,h) no appreciable change; Mxp3 (Fig.9,i), endopod longer than exopod which has 1+4+1 or 0+4+1 setae; P1 to P3 (Fig.9,j) with 5 segmented endopod, well formed chelae retain the long setae; P4 and P5 (Fig.9,k) with 5 segmented endopod, distal segment with 2 apical setae, 4th segment with 1 inner and 2 outer setae, 3rd with 1 outer and 1 inner setae, 2nd with no seta and 1st with one inner seta; uropod (Fig.9,l) with 22 plumose setae on endopod, exopod with 20 plumose setae and 1 non-plumose seta shorter than distolateral spine. Duration of this substage was 24 to 48 hours.

### INTERMEDIATE STAGE

MCL: 1.50mm (1.48-1.53 mm); MTL: 4.54 mm (4.49-4.59 mm).

Rostrum with 1 distinct tooth; no change in spination of carapce and abdomen (Fig. 10,a); pleopod (Fig. 10,k) with 10 plumose setae; exopods of Mxp2, Mxp3 and P1 to P5 with plumose setae; shallow cleft of telson still present (Fig.10,l).

A1 (Fig.10,b) with 3 segmented inner flagellum which is longer than 2 segmented outer flagellum; A2 (Fig.10,c) endopod 6 segmented tipped with 5 setae, exopod with 23 plumose setae and prominent distolateral spine; Md (Fig. 10, d) free standing teeth absent, palp unsegmented, with 4 setae; Mx1 (Fig. 10,e) no appreciable change; Mx2 (Fig.10,f) with 19 to 20 plumose setae on exopod; Mxp1 (10,g) exopod and endopod reduced in size, protopod segments

enlarged, gill rudiment developed; Mxp2 (Fig.10,h) endopod sigmoid, setae reduced in length; Mxp3 endopod longer than exopod, exopod setae still present; P1 to P3 (Fig.10,i) chela fully developed without long terminal setae; exopods still with setae; P4 to P5 (Fig.

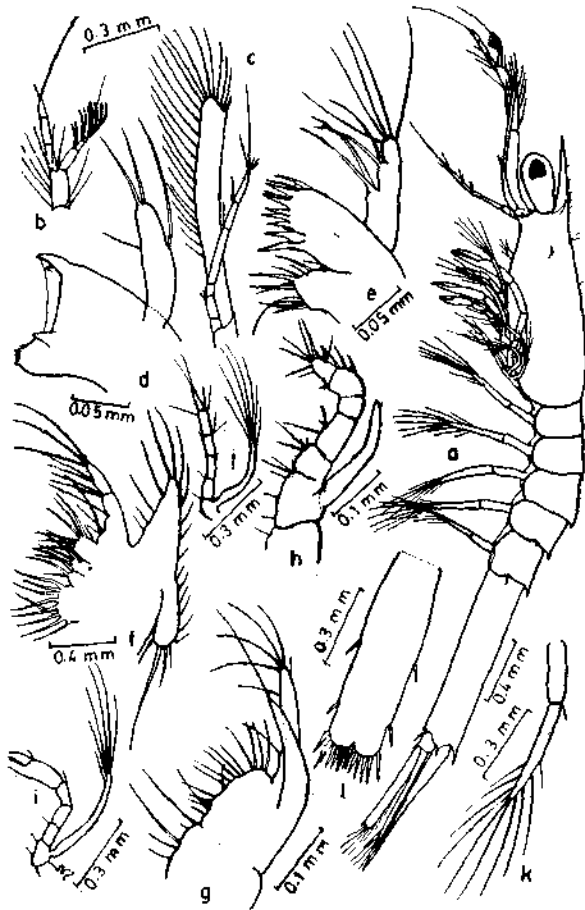


Fig. 10 *Penaeus monodon* - Intermediate stage: a - lateral view; b - tip of A1; c - A2; d - Md; e - Mx1; f - Mx2; g - Mxp1; h - Mxp2; i - P1; j - P4; k - pleopod; l - telson.

10,j) endopods without long terminal setae, exopods retain the setae; uropod with 23 plumose setae on endopod, exopod with 22 plumose setae and 1 nonplumose seta shorter than prominent distolateral spine. Duration of this substage was 24 to 30 hours.

#### POSTLARVA 1

MCL: 1.46 mm (1.40-1.54 mm), MTL: 4.56 mm (4.45-4.70 mm).

Rostrum with 1 distinct tooth, supraorbital spine reduced in size, no change in spination

of carapace and abdomen (Fig.11,a) pleopods setose (Fig.11,l) exopods on Mxp2, Mxp3, p1 to p5 shrunken, without setae; shallow cleft in telson still present (Fig.11.b).

A1 (Fig.11,b) 3 segmented inner flagellum twice as long as 2 segmented outer flagellum; A2 (Fig.11,c) endopod 6 segmented, exopod with 25 plumose seta and prominent distolateral spine; Md (Fig.11,d) cutting edge developed, palp 2 segmented, short distal segment with 2 and longer proximal segment with 4 setae; Mx1 (Fig.11,e) setae on distal endite short and stout, endopod reduced in size, without setae; Mx2 (Fig.11,f) exopod

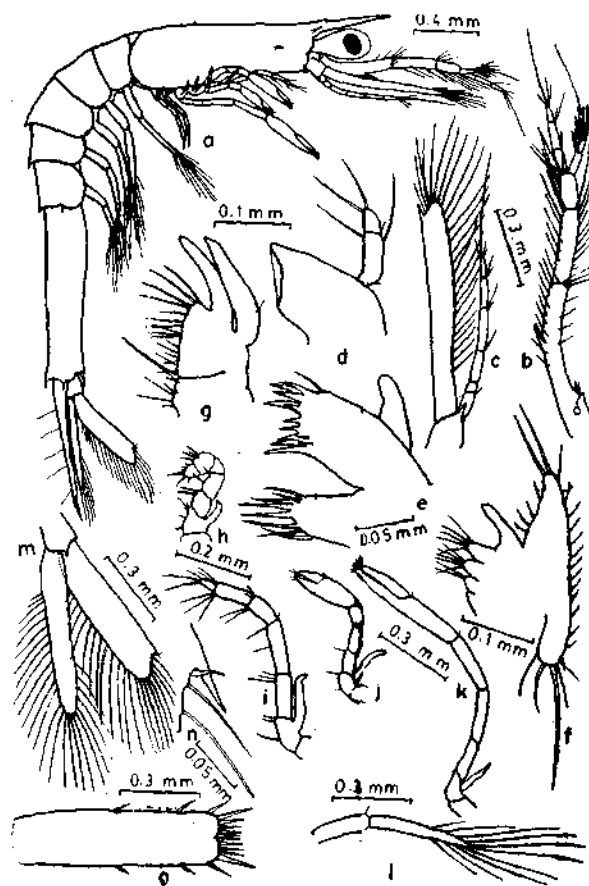


Fig. 11 *Penaeus monodon*: Postlarva 1: a - lateral view; b - A1; c - A2; d - Md; e - Mx1; f - Mx2; g - Mxp1; h - Mxp2; i - Mxp3; j - P1; k - P3; l - pleopod; m - uropod; n - uropod, distolateral angle; o - telson.

with 24 setae, endopod unsegmented reduced in size; Mxp1 (Fig.,11g) protopod enlarged, exopod and endopod unsegmented, reduced in size, endopod without setae, exopod with



single outer seta; Mxp2 (Fig.11,h) recurved endopod with stout setae on distal segment, exopod shrunken without setae; Mxp3 (Fig. 11,i) shrunken exopod without setae; p1 to p3 (Fig.11,j,k) chela functional, without long terminal setae, exopod vestigial; p4 and p5 exopod vestigial; uropod (Fig.11,m), endopod with 25 plumose setae, exopod with 22

plumose setae and 1 nonplumose seta shorter than distolateral spine (Fig 11.n).

#### DISCUSSION

The present larval description of *P. monodon*, differs from that given by Villaluz<sup>1</sup> in some respects. The differences are tabulated below:

	<i>P. monodon</i> (Present)	<i>P. monodon</i> (Villaluz <sup>1</sup> )
<i>Nauplius I</i>		
A 1	distal inner lateral seta long	distal inner lateral seta short
A 2	endopod with 4 setae, 2 inner lateral, 2 long terminal, a setal rudiment present terminally	endopod with 3 setae, 1 inner lateral, and 2 long terminal
<i>Nauplius II</i>		
A 1	1 long and 2 short terminal setae, 1 short outer lateral seta and 2 longer inner lateral setae	1 short and 2 long terminal setae, long outer lateral and 2 short inner lateral setae
A 2	endopod with 2 long setae and 1 setal rudiment at tip and 2 short inner setae	endopod with 2 long and 1 short seta at tip and 1 short inner lateral seta
<i>Nauplius III</i>		
A 1	7 setae, 2 long and 1 short at tip, 2 long and 1 minute on inner margin and 1 very thin outer lateral	5 setae, 3 long at tip and 2 long at sides
A 2	endopod with 5 setae 2 long and 1 short at tip and 2 short inner lateral	enopod with 6 setae, 3 long at tip and 3 short inner lateral
<i>Nauplius IV</i>		
A 1	6 setae, 2 long and 1 short at tip and 2 long and 1 short inner lateral	5 setae, 3 long at tip and 2 short at sides.
A 2	exopod with 9 setae, 2 long, 1 short and 1 rudimentary at tip, 4 long and 1 rudimentary on inner lateral margin; segments not distinct; endopod with 6 setae, 3 long and 1 rudimentary at tip, 2 short at side	exopod with 7 setae, 2 long and 2 short at tip and 3 long on inner margin, segments distinct, endopod with 5 setae, 3 long at tip and 2 short at side

*Nauplius V*

A 1                    7 setae, 2 long and 1 short at tip, 2 long and 1 rudimentary on inner lateral side and 1 rudimentary on outer lateral                    6-7 setae, 2 long and 1 short at tip and 3-4 short at side; 2-3 tiny spines at sides

A 2                    exopod segments not clear                    exopod with 8 segments

*Nauplius VI*

A 1                    9 setae, 2 long and 1 short at tip and 2 short and 1 rudimentary on outer lateral side, 2 long and 1 rudimentary on inner lateral side, segmentation not clear                    6-7 setae; 2 long and 2 short at tip and 2-3 short at sides, 2-3 tiny spines at sides, 9-11 short basal segments

A 2                    exopod with 12 setae, 2 long, 1 short and 1 rudimentary at tip, 5 long, 1 short and 1 rudimentary on inner margin, and 1 rudimentary on outer margin, segmentation faint, endopod with 6-7 setae, 3 long and 1 short at tip and 2-3 short on inner margin                    exopod with 10 setae, 3 long and 1 short at tip and 4 long and 2 short at sides; 9 segments, endopod with 6-7 setae, 4 long at tip and 2-3 short at side

*Protozoa I*

Mx1                    6 setae on proximal endite and 4 setae on distal endite                    7 setae on proximal endite and 5 setae on distal endite

Mxp1                    endopod with 3, 1, 2 and 5 setae                    endopod with 2-3 setae on each of first 3 segments and 5 distal segments

*Protozoa II*

Mx1                    6 setae on proximal endite and 7 on distal endite                    7 setae on proximal endite and 5 setae on distal endite

*Protozoa III*

Mxp1                    9 setae on exopod                    7 setae on exopod

Mxp2                    7 setae on exopod                    6 setae on exopod

*Mysis I*

Mxp1                    exopod with 12 setae                    exopod same as in protozoa stage

Uropod                    17-18 setae on exopod and 16 setae on endopod                    16-17 setae on exopod and 15-16 setae on endopod

*Mysis II*

A 2	exopod with 19 setae	exopod with 17-18 setae
Uropod	exopod with 19 setae, endopod with 20 setae	exopod with 19-21 setae, endopod with 17-19 setae

*Mysis III*

A 1	outer and inner flagellum not segmented	outer flagellum with 2 faint segmentations, inner with 3 faint segmentations
A 2	endopod 2 segmented	endopod with 4 faint segments
Mx2	exopod with 22 setae	exopod with 19-20 setae

*Postlarva I*

uropod	endopod with 25 and exopod with 23 setae	endopod with 22-23 and exopod with 21-22 setae
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The intermediate stage described here is rare and is probably a deviation from the normal course of larval development. not mentioned by Villaluz *et. al.* <sup>1</sup>. Even during the present study the intermediate stage was