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KEY TO THE IDENTIFICATION OF LARVAE AND POSTLARVAE OF THE PENAEID PRAWNS (DECAPODA: PENAEIDEA) OF THE INDIAN OCEAN

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ABSTRACT

Some of the major criteria for identifying the larvae and early postlarvae of the penaeid prawns of the Indian Ocean are presented based on the study on material collected during the International Indian Ocean Expedition (1960-'65). The key also permits identification of the species of protozoeae, mysis and postlarvae of 13 genera, both of commercial importance and of less commercial value.

Key words: Penaeid prawns, Indian Ocean.

INTRODUCTION

The penaeid prawns contributing to the commercial fishery of the East and West coasts of India are mostly identified by Alcock (1906), Mohammed, Rao and George (1968), George (1969, '80) and Kurian and Sebastian (1976). Knowledge on the life history of many of these species is still incomplete; larval forms of the genera *Metapenaeopsis, Atypopenaeus, Trachypenaeus,* and *Trachypenaeopsis*, and a few others are not hitherto fully traced or assigned to their parentage. The larval stages of 3 commercially important genera, viz. *Penaeus, Metapenaeus* and *Parpenaeopsis* have been studied by various authors and key for identification of the penaeid larvae of some of the genera are also available (Cook, 1966, Hussan, 1974 Haq and Hassan 1975, and Rao 1973). Paulinose (1973, 1979) made an extensive study on the larvae of the penaeid genera other than the above 3 genera, namely *Trachypenaeus, Atypopenaeus, Trachypenaeopsis, Parapenaeus, Penaeopsis, Sicyonia* and *Funchalia.*

In view of the importance of correct identification for exploitation and proper management of the fishery a generic key to the identification of the larval and post-larval stages of both, commercially important and less important species of the Indian Ocean is, prepared and presented here. This is based on the material collected during the International Indian Ocean Expedition (IIOE) and other details already available in the literature. The present key provides criteria for identification of the larvae and postlarvae of the following genera, *Penaeus* Fabricius; *Metapenaeus* Wood-Mason and Alcock; *Parapenaeopsis* Wood-Mason; *Parapenaeus* Smith; *Trachypenaeus* Alcock, *Metapenaeopsis* Bouvier; *Atypopenaeus* Alcock, *Penaeopsis* Bate; *Funchalia* Johnson; *Trachypenaeopsis* Burkenroad; *Sicyonia* H.M. Edwards; *Aristaeomorpha* Wood-Mason and *Solenocera* Lucas.

Key to the genera and species of penaeid larvae and early postlarvae

I. PROTOZOEAE

1. Rostrum long, reaching beyond the basal segment of the antennular peduncle 2

   Rostrum short, not reaching the basal segment of the antennular peduncle 3

2. Dorsomedian spine of the 2nd abdominal segment longer than the rest; posterolateral spines present on 3-6 abdominal segments .. *Aristaeomorpha.*

   Dorsomedian spines present on the 1st 5 abdominal segments; posterolateral spines present on the 5th and 6th abdominal segments 4

3. Rostrum very short; supraorbital spines absent; antennule is the longest appendage; distal segment of the antennular peduncle with 3 long terminal setae; endopod of antenna with 1 + 2 + 3 lateral setae; telson with 7 + 7 telsonic processes .. .. *Sicyonia.*

   Rostrum short; terminal segment of the antennular peduncle bearing 2 long and a short seta; endopod of antenna with 2 + 2 lateral setae; telson with 8 + 8 telsonic processes .. .. .. *Parapenaeopsis.*

4. Telson with 7 + 7 telsonic processes 5

   Telson with 8 + 8 telsonic processes 7

5. Supraorbital spines absent; basal segment of the antennular peduncle subsegmented and distal segment with 2 long and a short seta; endopod of antenna with 2 + 2 lateral setae

   Supraorbital spines present 6

6. Supraorbital spines weak and small; distal segment of the antennular peduncle with 2 long a short terminal seta, endopod of antenna with 1 + 2 + 2 lateral setae *Penaeopsis.*

   Supraorbital spines prominent; distal segment of the antennular peduncle with one long and two short setae; endopod of antenna with 1 + 2 + 3 lateral setae *Metapenaeus.*

7. Carapace with 2 pairs of supraorbital spines; distal segment of the endopod of antenna with 5 terminal setae *Parapenaeus.*

   Carapace with a single pair of supraorbital spines (bifurcate supraorbitals in the 2nd protozoea) present *Penaeus.*

II. MYSIS

1. Carapace and abdomen with many spines, a dorsal organ present on the dorsal surface of the carapace *Solenocera.*

   Carapace and abdomen without many spines; a dorsal organ absent .. 2.

2. Ventromedian spines present on the abdominal segments .. 3.

   Ventromedian spines not present on the abdominal segments .. 6.

3. Rows of ventrolateral spines (5-10) present on the 6th abdominal segment; carapace with a hepatic spine .. .. .. 4.

Rows of ventrolateral spines not present on the 6th abdominal segment 5.

4. Dorsomedian spines present on 2-6 abdominal segments and that of the second is the longest; 4-6 pairs of ventrolateral spines present on the sixth abdominal segment .. .. .. *Aristaeomorpha.*

Dorsomedian spines present only on the 6th abdominal segment; body pubescent; 5-10 pairs of ventrolateral spines present on the 6th abdominal segment .. .. *Funchalia.*

5(a) Dorsomedian spines present only on the sixth abdominal segment; dorsolateral spines absent; ventromedian spines curved anteriorwards; hepatic spine absent .. .. *Sicyonia.*

(b) Dorsomedian spines present on 3-6 abdominal segments and that of the 3rd is the longest; dorsolateral spines present on the 5th and the 6th abdominal segments; ventral spines curved posteriorwards, hepatic spine present .. .. *Parapenaeus.*

A pterygostomian spine present .. .. .. b(1)

A pterygostomian spine absent; the 3rd dorsomedian spine on the abdominal segment is borne on a crest; telson with 10 + 1 + 10 telsonic processes .. .. *P. longipes.*

b(1) The pterygostomian spine is placed a little behind the anteroinferior angle of the carapace; 6th abdominal segment long; telson with 8 + 1 + 8 telsonic processes .. *P. investigatoris.*

The pterygostomian spine is placed at the antero-inferior angle of the carapace; rostrum with a small number of dorsal teeth; telson with 9 + 1 + 9 telsonic processes .. .. *P. fissurus.*

6. Dorsomedian spines present on 3 to 6 abdominal segments; telson with 7 + 1 + 7 telsonic processes 7

Dorsomedian spines present on 4-6 abdominal segments; telson without median spine .. .. .. 8.

7(a) Pleura of the first 5 abdominal segments not serrated ventrally; dorsomedian spines smaller; size of animal small .. .. *Atypopenaeus.*

(b) Pleura of the first 5 abdominal segments serrated ventrally; dorsomedian spines longer; size of animal bigger .. .. *Metapenaeopsis.*

A pair of dorsolateral spines present on the fifth abdominal segment .. b(1).

A pair of dorsolateral spines not present on the fifth abdominal segment .. .. *M. mogiensis.*

b(1) Rostrum long, only the anteroinferior margin of the carapace is serrated .. .. *M. barbata.*

Rostrum not long, both the anteroinferior and posteroinferior margins of the carapace are serrated .. .. *M. andamanensis.*

8(a) Telson without a median spine; spine formula is 8 + 8; size of the animal bigger .. .. .. 9.

(b) Telson with a median spine; spine formula is 7 + 7; size of animal smaller .. .. *Metapenaeus.*

Median dorsal spine on the 5th abdominal segment is conspicuous .. b(1)

Median dorsal spine on the 5th abdominal segment is less conspicuous .. .. *M. dobsoni.*

b(1) Rostrum extending to 3/4th the eye; larvae conspicuously brownish; size slightly bigger .. .. *M. monoceros.*

Rostrum reaching the tip of the eye or slightly beyond it; larvae not brownish; size smaller .. .. *M. affinis.*

9. Rostrum long; dorsomedian spines present on 3 to 6 abdominal segments; dorsolaterals present on the 5th and 6th abdominal segment .. *Penaeus.*

Rostrum short; dorsomedian spines present on the 5th and 6th abdominal segments; dorsolateral spines not present on abdominal segments .. 10.

10. Rostrum shorter than eye; hepatic spine absent; supraorbitals small .. .. *Parapenaeopsis.*

Rostrum reaches the end of the eye; antennal spine prominent; hepatic absent .. .. *Trachypenaeus.*

11. Anteroinferior margin of carapace is serrated; telson with 7 + 1 + 7 telsonic processes .. .. .. 12.

12. Dorsolateral spines present on the 5th abdominal segment; hepatic spine present .. *Penaeopsis rectacuta.*

Dorsolateral spines present on the 5th abdominal segment; hepatic spine absent .. .. *Trachypenaeopsis.*

III. POSTLARVAE

1. Telson with a median spine .. .. .. 2.

Telson without a median spine .. .. .. 9.

2. Ventromedian spines present on the abdominal segments .. .. 3.

Ventromedian spines not present on the abdominal segments .. 6.

3. Rows of ventrolateral spines present on the sixth abdominal segment .. 4.

Rows of ventrolateral spines not present on the sixth abdominal segment 5.

4. Carapace with a hepatic spine; dorsomedian spine on the 2nd abdominal segment longer than the rest; ventromedian spines curved posteriorly; thoracic legs with exopods .. .. *Aristaeomorpha.*

Dorsomedian spines not present on the abdominal segments; ventromedian spines curved anteriorly; thoracic legs without exopods .. *Funchalia.*

5(a) Rostrum very short; dorsomedian spines not present; a dorsal carina present on 3-5 abdominal segments; first abdominal segment with an anteromedian spine on dorsal surface; walking legs without exopods .. .. *Sicyonia*

(b) Rostrum long; dorsomedian spines present on 3 to 6 abdominal segments; that of the 3rd is the longest; dorsolateral spines may be present or absent on the last 2 abdominal segments; thoracic legs with exopods .. *Parapenaeus.*

Supraorbital spines absent; dorsomedian spine on the 3rd abdominal segment is present on a crest .. .. .. b(1).

Supraorbital spines prominent; pterygostomian spine is placed at the anteroinferior angle of the carapace; dorsomedian spine on the 3rd abdominal segment without a crest; telson with 9 + 1 + 9 telsonic processes .. *P. fissurus.*

b(1) Pterygostomian spine present and placed a little behind the anteroinferior angle; telson with 8 + 1 + 8 telsonic processes; a pair of dorsolateral spines present on the 5th abdominal segment .. .. *P. investigatoris.*

Pterygostomian spine absent; telson with 10 + 1 + 10 telsonic processes; dorsolateral spines on the 5th abdominal segment not present .. *P. longipes.*

6. Rostrum very short; branchiostegal spine present; hepatic small; posterior margin of telson tapering between posterolateral spines; telson with 8 + 1 + 8 telsonic processes .. .. *Parapenaeopsis.*

Rostrum medium; branchiostegal spine absent; a ventromedian spine present on the 7th thoracic segment; telson tapering towards the end; telson with 7 + 1 + 7 telsonic processes .. .. *Trachypenaeopsis.*

7. Dorsomedian spines present on 3 to 6 abdominal segments; telson with 7 + 1 + 7 telsonic processes .. .. .. 8.

Dorsomedian spines present only on the last two abdominal segments; a pair of dorsolateral spines present on the 5th abdominal segment .. *Penaeopsis.*

8(a) Rostrum short; supraorbital spines not present; anteroinferior margin of the carapace smooth; hepatic present; dorsolateral spines present on the 5th abdominal segment; segment; abdominal pleura not serrated .. *Atypopenaeus.*

b) Rostrum long; supraorbital spines present; anteroinferior margin of carapace serrated; hepatic prominent; dorsomedian spines longer; dorsolateral spines on the 5th abdominal segment not present; abdominal pleura serrated *Metapenaeopsis.*

Dorsolateral spines present on the 5th and 6th abdominal segments .. b(1).

Dorsolateral spines not present on the abdominal segments .. *M. mogiensis.*

b(1) Pleura of abdominal segments forming spines except that of the 5th segment .. .. *M. andamanensis.*

Pleura of abdominal segments serrated but not forming spines .. *M. barbata.*

9. Rostrum long; supraorbital spines present; antennal spine absent; dorsomedian spines present on abdominal segments; telson with 8 + 8 telsonic processes .. 10
Rostrum short; antennal spine present; supraorbital spine absent; dorsomedian spines present only on the 6th abdominal segment; telson with 7 + 7 telsonic processes .. .. *Metapenaeus.*

(a) Rostrum short; pterygostomian spine absent; anteroinferior angle of carapace smooth, long setae on distal lateral aspect of the 6th abdominal segment .. .. .. a(1).

Rostrum short; anteroinferior angle of carapace is pointed; no setae on distal lateral aspect of the 6th abdominal segment; first 3 pairs of legs with basial spines .. .. *M. dobsoni.*

a(1) Epigastric tooth on carapace absent; larva brownish; 1st pair of legs with an ischial and a basial spine .. .. *M. monoceros.*

Epigastric tooth on carapace present; larva not brownish; legs with no spines .. .. *M. affinis.*

10(a) Carapace without supraorbital and hepatic spines; dorsolateral spines present only on the 6th abdominal segment; antennal spine present; a dorsal carina is present on 3 to 5 abdominal segments .. .. *Trachypenaeus.*

(b) Carapace with supraorbital and hepatic spines; dorsolateral spines present on the 5th and 6th abdominal segments; dorsomedian spines present on 3-6 abdominal segments .. .. *Penaeus.*

b(1) Rostrum having a small crest; antennal spine present; antennal scale and peduncle equal in length; dorsolateral spines present on 4 to 6 abdominal segments .. .. *P. merguiensis.*

b(2) Rostrum without crest; antennal spine absent; scale surpasses the antennal peduncle .. .. *P. indicus.*

b(3) Hepatic spine very strong; thoracic legs without exopods; antennular peduncle and antennal scale equal in length; telson slightly longer than the uropods .. .. *P. monodon*

b(4) Hepatic spine small; antennal scale surpasses the antennular peduncle, uropods longer than the telson .. .. *P. semisulcatus.*

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