

## LARVAL AND POSTLARVAL STAGES OF *ATYPOPENAEUS* ALCOCK (DECAPODA, PENAEIDAE : PENAEINAE) FROM INDIAN OCEAN

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### ABSTRACT

Two of the early mysis stages and an early postlarva of a species of *Atypopenaeus* are described here for the first time. A total of 15 specimens were obtained from the Indian Ocean during the International Indian Ocean Expedition (IIOE). The species of the genus is tentatively assigned to the most common, local species, *Atypopenaeus stenodactylus* (Stimpson). This species is caught from the east and west coasts of India.

*Key-words:* Mysis, postlarva, *Atypopenaeus*, Indian Ocean.

### INTRODUCTION

Two of the early mysis stages and an early postlarva of the genus *Atypopenaeus* were obtained from the collections of the IIOE (1960-'65). The larvae included mysis I & II and an early postlarva (I). The species is not found in abundance in any area but for the coast off Bombay (Kunju, 1960 and 1967). No description of any kind on the larvae and postlarvae of this genus is available in literature. Information regarding the occurrences of the genus *Atypopenaeus* are available from the works of Alcock (1906) off Madras coast; Henderson (1893) from Martaban; De Man (1911) from Bay of Bima; Kunju (1960 and 1967) off Bombay; Kubo (1949), from the Inland Sea of Japan and Racek and Dall (1965) from the Australian waters in the Indo-Pacific. The specimens are tentatively identified as belonging to the genus *Atypopenaeus*. Literature on the descriptions of many of the penaeid genera found in the Indian Ocean are scanty. However, some of the adult characters noticed in the postlarvae, such as, a short rostrum, presence of a dorsal carina on carapace, carination of the abdominal segments, absence of longitudinal and transverse sutures on carapace and presence of exopodites on all legs, were useful in the identification of this genus. Moreover, the nature of distribution, the occurrence of the larvae and postlarvae in regions where the adults were reported, along with other circumstantial evidences support this identification.

Fifteen specimens were obtained from 11 samples which form the subject of the present study. *A. stenodactylus* (Stimpson) is the common species recorded in the east and west coasts of India. The present larvae and postlarvae were obtained from the southwest coast of India, off Bombay, off Madras, Gulf

of Martaban and north east of Maldives from where the adults were previously recorded. Hence, in all probability the present specimens belong to the species, *A. stenodactylus* which is only a synonym of *A. compressipes*.

#### MATERIALS AND METHODS

The samples were collected using the Indian Ocean Standard Net during cruises of INS 'Kistna', (Ki) 'Anton Bruun' (AB) 'Gascoyne' (Ga) and 'Meteor' (Me) in the International Indian Ocean Expedition (1960-65). Fifteen specimens were in mysis and postlarval stages.

#### DESCRIPTION

##### Larval Stages

*Mysis* I: Length 4.0-4.2 mm (Fig. 1a-h)

Material : 3 specimens

Locality: Stn. Ki 662; Me 188 and 196 (IOBC, 1969)

off Mangalore and southwest coast of India in the Arabian Sea.

Rostrum bears 1 + 1 epigastric tooth and extends slightly beyond the eyes. The epigastric is placed far back on the rostrum carapace with a small pterygostomian and hepatic spines. The anteroinferior margins of the carapace is serrated (Fig. 1a). Antennular peduncle 3-segmented, bearing 2 unjointed flagella; inner flagellum small and bears a seta terminally; basal segment of the peduncle has a prominent spine laterally (Fig. 1b). Antenna with an unsegmented endopod and scale; scale with a terminal seta on the outer margin (Fig. 1c). Mandible with incisor and molar processes; 7 denticular setae present in the left and 3 in the right mandible. Mandibular palp short and unsegmented (Fig. 1d). Maxillule with 5 setae on the distal segment of the endopod and 4 setae on the exopod (Fig. 1e). The distal segment of the endopod of the maxilla bears 3 setae and the exopod with 8 setae (Fig. 1f).

Dorsomedian spines present on 3 to 6 abdominal segments. A pair of dorsolateral spines present on the 5th abdominal segment. Thoracic legs with exopods. Pleopods absent.

The uropodial exopod with an externo-distal spine (Fig. 1g). Telson squarish, with a narrow, deep cleft, and a spine formula of 7 + 7 spines; 4th spine the longest (Fig. 1h).

*Mysis* II: Length 4.2 mm (Fig. 2 a-h). New description.

Material: 1 specimen.

Locality: Stn. Ki 662 (IOBC, 1969)-southwest coast, off Mangalore in the Arabian Sea.

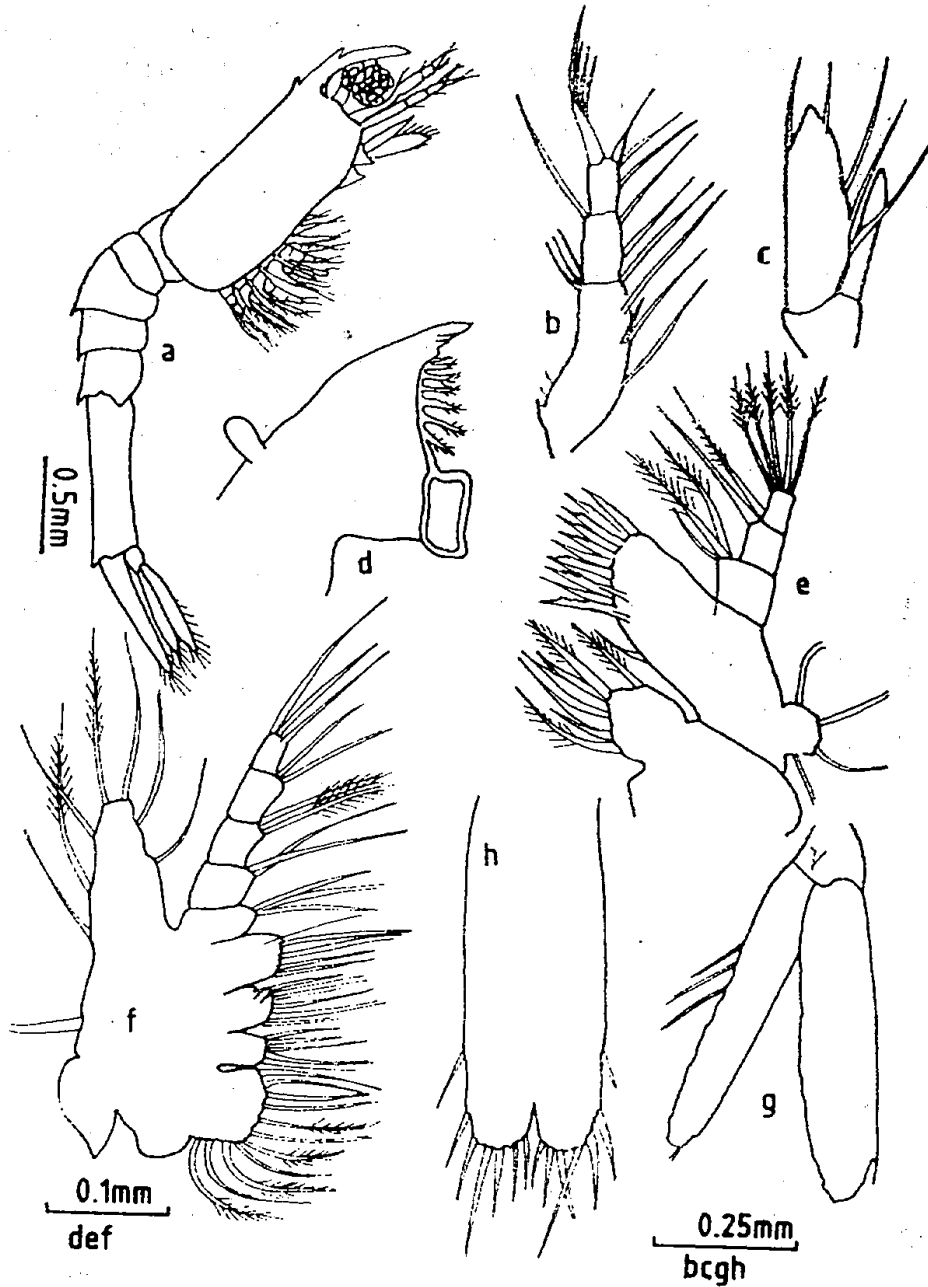


Fig. 1 *Atypopenaeus stenodactylus* (Stimpson), mysis I.  
 (a) entire animal; (b) antennule; (c) antenna; (d) mandible;  
 (e) maxillule; (f) maxilla; (g) uropod; (h) telson.

Rostrum bears 2 dorsal + 1 epigastric teeth, the latter is placed far back on the rostrum. Hepatic and pterygostomian spines more prominent. The serrations at the anteroinferior margin of carapace reduced (Fig. 2a). Antennule remains unchanged (Fig. 2b). Antenna with a segmented endopod; scale with terminal spine and a strong spine on the basal segment (Fig. 2c). The maxillule (Fig. 2d) without an exopod. Exopod of maxilla with a stout seta basally (Fig. 2e). Maxilliped I with setose exopods and endopods (Fig. 2f).

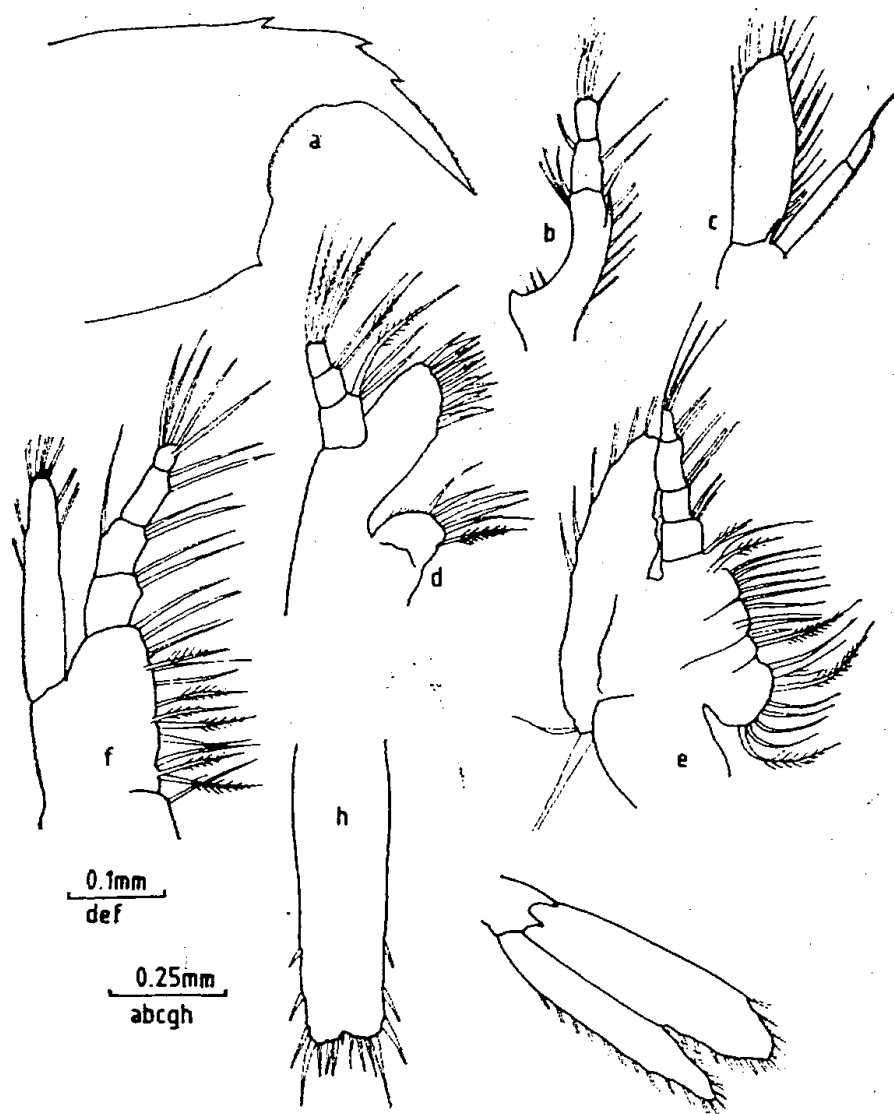


Fig. 2 *Atypopenaeus stenodactylus* (Stimpson), mysis II.  
 (a) carapace; (b) antennule; (c) antenna; (d) maxillule; (e) maxilla;  
 (f) maxilliped I, (g) uropod; (h) telson.

Spines of abdominal segments remain the same. Pleopods appear as small buds. Uropod unchanged (Fig. 2g). The cleft in the telson much reduced and a small median spine is implanted in it (Fig. 2h). The spine formula becomes 7 + 1 + 7 spines .

*Postlarva I*: Length 5.3-6.3 mm (Fig. 3 a-h). New description.

Material: 11 specimens

Locality: Stn. AB 326; Ga 187; Ki 326, 359, 515, 702; and Me 210 (IOBC, 1969) — Gulf of Martaban and off Madras in the eastern Indian Ocean and off Cochin and Bombay in the Arabian Sea.

Rostrum bears 3 dorsal + 1 epigastric teeth and extends slightly beyond the eyes. Hepatic and pterygostomial spines persist (Fig. 3a).

Antennule with stylocerite; strongly setose and the outer flagellum 2-segmented (Fig. 3b). Antenna with segmented flagellum, scale narrow with terminal spine and with many setae (Fig. 3c). Mandibular palp unsegmented and without setae. The number of denticular setae remains the same as in the previous stage; molar and incisor processes well developed (Fig. 3d). Maxillule

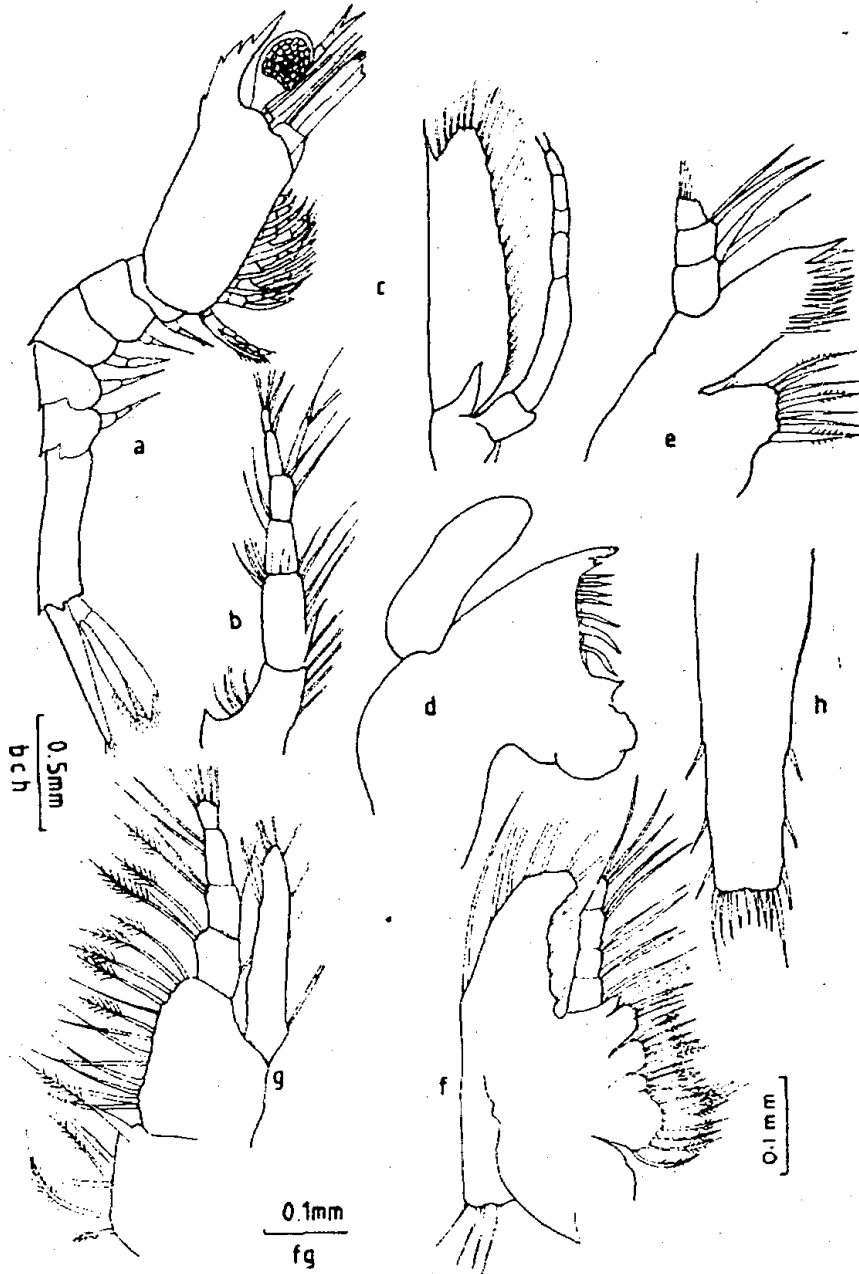


Fig. 3 *Atypopenaeus stenodactylus* (Stimpson), postlarva I.  
 (a) entire animal; (b) antennule; (c) antenna; (d) mandible;  
 (e) maxillule; (f) maxilla; (g) maxilliped I; (h) telson.

(Fig. 3e) remains unchanged. Exopod of maxilla with many setae and a thick and plumose basal seta (Fig. 3f). Maxilliped I with segmented endopod and with plumose setae (Fig. 3g).

All thoracic legs with exopods. Dorsomedian spines present on 3-6 abdominal segments. The 5th and 6th segments with a pair of dorsolateral spines. Pleopods uniramous with a seta. The tip of telson tapers, spines longer and spine formula remains  $7 + 1 + 7$  spines (Fig. 3h).

#### *Distribution of larvae*

It is rather difficult to say that the larvae are abundant in any region of the Indian Ocean, considering the very low percentage of the larvae obtained. Only a few regions have been noted for their presence and there were already records of adults of the species from all these regions. The larvae were mainly collected from areas close to the coasts and no larvae was collected from the central or southern parts of the Indian Ocean (Fig. 4). The present materials

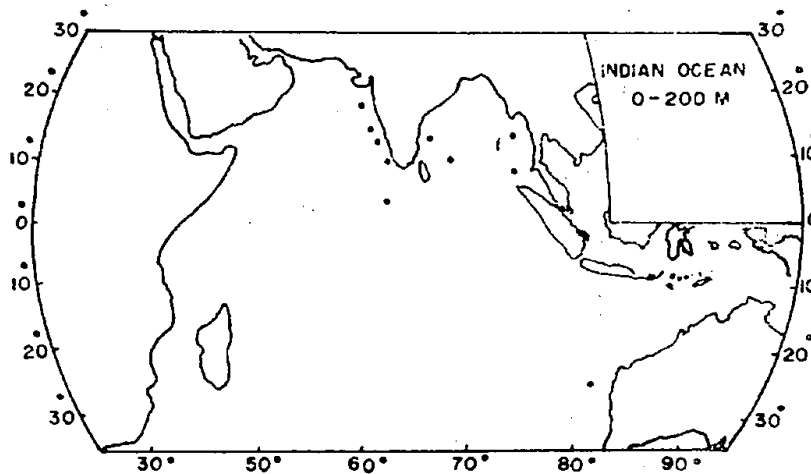


Fig. 4 Larval distribution of *Atypopenaeus stenodactylus* (Stimpson).

were collected from the gulf of Martaban north of northern head of Sumatra, east off Madras, north east of Ceylon in the eastern Indian Ocean and on west coast off Bombay, off Mangalore and Cochin in the Arabian Sea. The larvae occurred mainly in shallow, coastal stations which indicates that this is a shallow water species.

#### DISCUSSION

The present larvae and postlarvae differ from other larvae of penaeids described previously, and they are included under the genus *Atypopenaeus*. The first 2 mysis stages of this species were collected from the southwest coast of India, the first record of the larvae from this region. The place of occur-

rance of these larvae, the two early mysis stages in the same sample (Stn. Ki 662) gives additional support to the identification. The only other possible genus to which these larvae could be included is *Trachypenaeopsis*.

Kubo (1949) included *Atypopenaeus* and *Trachypenaeopsis* along with *Metapenaeus* and *Penaeopsis* in a single group based on the similarity of the thelycum in these genera. De Man (1911) remarked that *Trachypenaeopsis* and *Atypopenaeus* are closely related to each other. The larvae of these two genera have similarities in the spine formula of the telson. Dorsomedian spines on the abdominal segments is another important character. However, *Atypopenaeus* can be easily differentiated from *Trachypenaeopsis* by the presence of a dorsomedian spine on the third abdominal segment and a pair of dorsolateral spines on the 5th and 6th abdominal segments. Hence, in all probability the characters of the larvae and postlarvae support the larval identification to a species of *Atypopenaeus*. Two species of the genus viz. *Atypopenaeus compressipes* (Henderson) and *A. stenodactylus* (Stimpson) were known from the Indo-Pacific region. Hali (1961 & 1962) after a thorough study considered *A. compressipes* as a synonym of *A. stenodactylus* (Stimpson), which is confirmed by George (1979) and Holthuis (1980).

The larvae and postlarvae of the present material belonged to a single species of *Atypopenaeus*, *A. stenodactylus* ((Stimpson) being described as *A. compressipes* from different regions of the Indo-Pacific including the stations from which the present larvae have been collected by Alcock (1906), Kubo (1949), De Man (1911) and Racek & Dall (1965), the larval specimens are assigned to and described as *A. stenodactylus* (Stimpson).

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