

## On the occurrence of Dorippidae zoea in Parangipettai coastal waters

S.M. Raffi, P.S.Lyla and S. Ajmal Khan

*Centre of Advanced Study in Marine Biology  
Annamalai University  
Parangipettai, Tamil Nadu - 608 502*

### Abstract

From the brachyuran zoea collected from Parangipettai coastal waters, few were found surprisingly different from others with the extraordinarily elongated rostral and dorsal spines and peculiar nature of telson armature. The identity was established as that of Dorippidae zoea. The zoea showed pronounced similarity to Dorippid zoea collected from elsewhere except the presence of a paired posterolateral spines in abdominal somite five.

Dorippidae zoea caught the attention of larval taxonomists, due to its wide divergence from other brachyuran larval forms. Cano (1891, 1893) made a preliminary account of Dorippid zoea followed by those of Boraschi (1921), Gurney (1924, 1942), Aikawa (1937), Kurian (1956), Bourdillon-Casanova (1960) and Heegard (1963). Investigations on the larvae of Hokkaido coast by Kurata (1964) and the materials collected during "Meteor Expedition" by Rice and Williamson (1977) made a critical reexamination of Dorippid zoea. Classical work of Rice (1980) on brachyuran zoea portrays the careful perusal of earlier works done on Dorippid larval forms. Apart from the description of Menon (1937), works on the larval stages of Indian species of Dorippidae are found wanting.

The authors are thankful to the Department of Ocean Development, New Delhi for financial support. The authors thank Prof. Dr.V. Ramaiyan, Principal Investigator and Prof. Dr. T. Balasubra-

maniam, Director, Centre of Advanced Study in Marine Biology, Parangipettai, for the encouragement and the authorities of Annamalai University for the facilities.

The following report embodies the description of Dorippidae zoea collected from coastal waters of Parangipettai (lat. 11°29'N, long. 79°46'E) during July, 2001. The zooplankton samples were collected during early hours before dawn at 10 fathom line using the plankton net made of bolting silk with a mesh size of 0.078mm (No. 20). Immediately after collection, the samples were preserved in 4% neutralized formalin and brought to the laboratory for detailed analysis. Decapod larvae of shrimps, hermit crabs, brachyurans and other forms were segregated from the soup. Among the zoeal stages of brachyuran crabs, 6 were found to be different from others due to their extraordinarily elongated rostral and dorsal spines. These larvae were identified as zoea of family Dorippidae based on the

key of Rice (1980) and Ajmal Khan *et al.* (2001). Detailed examination on the characteristics of the larvae was carried out and the description is given below.

### Description of zoea

Total length of carapace (carapace+rostral spine+dorsal spine) : 20.5mm

Carapace length : 3.26 mm

Rostral spine length : 8.45 mm

Dorsal spine length : 8.9 mm

Abdomen length : 6.23 mm

**Carapace :** More or less triangular in lateral view, anterior-dorsal margin together with carapace, dorsal and rostral spines forming an almost straight line, dorsal and rostral spines forming an almost straight line, dorsal and rostral spines two to four times of carapace length and spinulose, lateral spines absent (Fig.1a)

**Antenna:** Exopod and spinous process sub-equal, exopod bears 2 rows of minute spinules, with 2 prominent setae about midway along its length; endopod reaching  $\frac{1}{2}$  length of spinous process (Fig.1b).

**Maxillule :** 2 segmented endopod, proximal unarmed and the distal with 4 terminal setae (Fig.1c).

**Maxilla :** Endopod with 4 setae; scaphonathite with 4 marginal setae and a long posterior plumose process, coxal endite with 2 setae (Fig.1d).

**First maxilliped :** Basis with 2,2,2 and medial setae, endopod segments with 3,2,1,2, and 5 setae respectively.

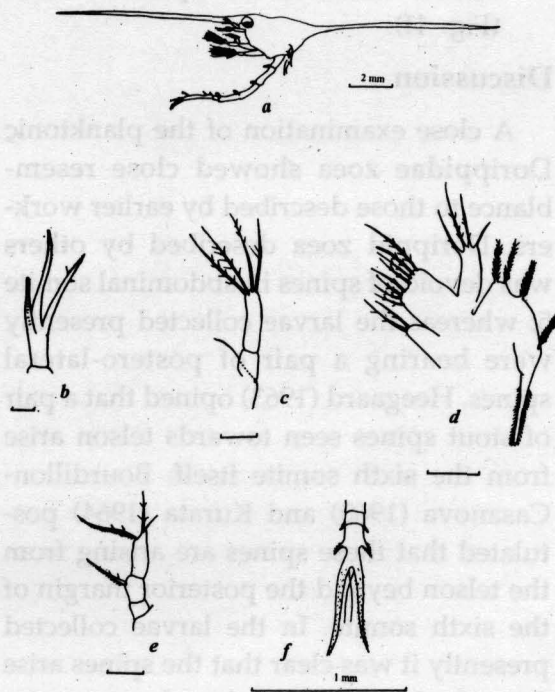


Fig. 1. *Dorippidae* zoea. a) lateral view of larva; b) antenna; c) maxillule endopod; d) maxilla; e) second maxilliped endopod; f) telson. Scale bars = 0.2 mm, except for a and f.

**Second maxilliped:** Basis with 3 medial setae, endopod segments with 0,1 and 3 setae respectively (Fig. 1e).

**Abdomen :** Abdomen with 6 somites, of which 2-5 about twice as long as broad, posterior margins unarmed, fifth somite bears a pair of posterolateral spines; pleopod buds present.

**Telson:** Total telson length at least six times its basal width, forks long, slender, spinulose and slightly divergent, devoid of outer spines (as that of other brachyurans), but a pair of stout spines, arise from basal part of the

telson anterior to apex of cleft (Fig. 1f).

### Discussion

A close examination of the planktonic Dorippidae zoea showed close resemblance to those described by earlier workers. Dorippid zoea described by others was devoid of spines in abdominal somite 5; whereas the larvae collected presently were bearing a pair of postero-lateral spines. Heegaard (1963) opined that a pair of stout spines seen towards telson arise from the sixth somite itself. Bourdillon-Casanova (1960) and Kurata (1964) postulated that these spines are arising from the telson beyond the posterior margin of the sixth somite. In the larvae collected presently it was clear that the spines arise from the basal part of the telson anterior to the apex of the cleft. Despite their anterior position, these spines are usually assumed to be homologous with the outer spines on the forks of brachyuran zoea, which vouch support for the present observation.

Dorippid zoea is so distinctive that it is difficult to see a close relationship between it and the larvae of other families of brachyura, due to the peculiar features such as enormous development of rostral and dorsal spines, telson armature etc.

In Parangipettai waters family Dorippidae is represented by only one species namely, *Dorippe facchino* (Sethuramalingam and Ajmal Khan, 1991). The zoea larva presently described may be of this species in all probability in

the absence of any other species occurring in the deeper waters. Laboratory hatching and rearing of larvae from berried females of *Dorippe facchino* will help to confirm this.

### References

- Aikawa, H. 1937. *Rec. Oceanogr. Wks Japan*, 9 : 87-162.
- Ajmal Khan, S., S. M. Raffi and P. S. Lyla. 2001. Larvae of decapod crustaceans. Annamalai University, 67p.
- Boraschi, L. 1921. *Memorie R. Com. talassogr. Ital.*, 87 : 1-32.
- Bourdillon-Casanova, L. 1960. *Recl. Trav. Stat. mar. Endoume*, 30: 1-286.
- Cano, G. 1891. *Memorie Soc. Ital. Sci. nat.*, 3 8(4) : 1-14
- 1893. *Attn. Acad. Sci. fish. nat. Napoli*, (2) 6(9) : 1-9
- Gurney, R. 1924. Decapod larvae. *Br. Antart. Terra Nova Exped. (Zoology)* 8 *Crustacea* : 37-202.
- 1942. Larvae of decapod crustacea. London : Ray Society.
- Heegaard, P. 1963. *Vidensk. Meddr dansk. naturh. Foren.*, 125 : 449-493.
- Kurata, H. 1964. *Bull. Hokkaido reg. Fish. Res. Lab.*, 29 : 71-74.
- Kurian, C.V. 1956. *Acta adriat.* 6 : 1-108.
- Menon, M.K. 1937. *Bull. Madras Govt. Mus.*, 3 (5) : 1-56.
- Rice, A.L. 1980. *Trans. zool. Soc. London*, 35 : 271-424.
- Rice, A.L. and D.I. Williamson. 1977. "Meteor" *Forsch. Ergebn.*, 26 : 28-64.
- Sethuramalingam, S. and S. Ajmal Khan. 1991. Brachyuran crabs of Parangipettai coast, Annamalai University, India, 44p.