

ON THE OCCURRENCE OF *METAPENAEOPSIS BARBATA*
(DE HAAN) (DECAPODA : PENAEIDAE) IN INDIAN WATERS
WITH TAXONOMIC NOTES ON THE GENUS

By M. J. GEORGE* and M. S. MUTHU†
Central Marine Fisheries Research Institute

DETAILED studies on a collection of penaeid prawns from Visakhapatnam coast showed that it contained two species belonging to the genus *Metapenaeopsis*. Out of these, *M. barbata* (De Haan) is not so far reported from Indian waters. Opportunity is taken to report about it here.

Metapenaeopsis barbata (De Haan)

Penaeus affinis barbatus De Haan 1850, p. 192.

Parapenaeus akayebi Rathbun 1902, p. 39.

Penaeus (Metapenaeus) akayebi De Man 1907, p. 433-34.

Penaeopsis barbatus De Man 1911, p. 88.

Metapenaeopsis barbatus Kubo 1949, pp. 413-19 ; Dall 1957, p. 17 (key) ; Hall 1961, p. 105.

Metapenaeopsis barbata Hall 1962, p. 32 ; Racek & Dall 1965, pp. 35-36.

Material : 29 females 47-10 5mm., carapace 9-22 mm., and 13 males 44-93 mm., carapace 8-18 mm.

Locality : Visakhapatnam coast, Lat. 17° 40'N. and Long. 83° 20'E, depth 24-48 m.

Remarks : The specimens on hand agree well with the detailed descriptions of De Man (1911) and Kubo (1949). Some variations noticed in the present material may be mentioned.

Rostrum straight and reaches tip of antennular peduncle. Kubo (*op. cit.*) noticed a variation of rostral teeth from 6 to 7 excluding epigastric spine. In the present collection specimens with 5 teeth were also present. The short subcarinae on the 4th abdominal segment noted by De Man (*op. cit.*) on re-examination of the type specimen in a dried condition and suggested by him as the effect of desiccation and later found to occur in Kubo's specimens as well as Singapore specimens recorded by Hall (1961), are found to be present in the Indian specimens also.

Present address : *Indian Ocean Biological Centre, Post Box 1913, Ernakulam, Cochin-18.
†Central Marine Fisheries Research Unit, Kakinada, Andhra Pradesh.

According to Kubo (*op. cit.*) the telson may or may not surpass the uropods. In the present material the telson, although reaching to the tip in some specimens, does not surpass the uropods. The ratio of length to width measured near the posterior end of the 6th abdominal segment varies from 1.85 to 2.30 in Kubo's specimens, while Hall's specimens are reported to be having a much higher ratio. The material on hand shows that the length is almost twice the width. Details of petasma and thelycum are dealt with separately.

Distribution : So far the species has been reported from the Japanese seas, Indonesia and Malaysia. This is the first report from Indian waters.

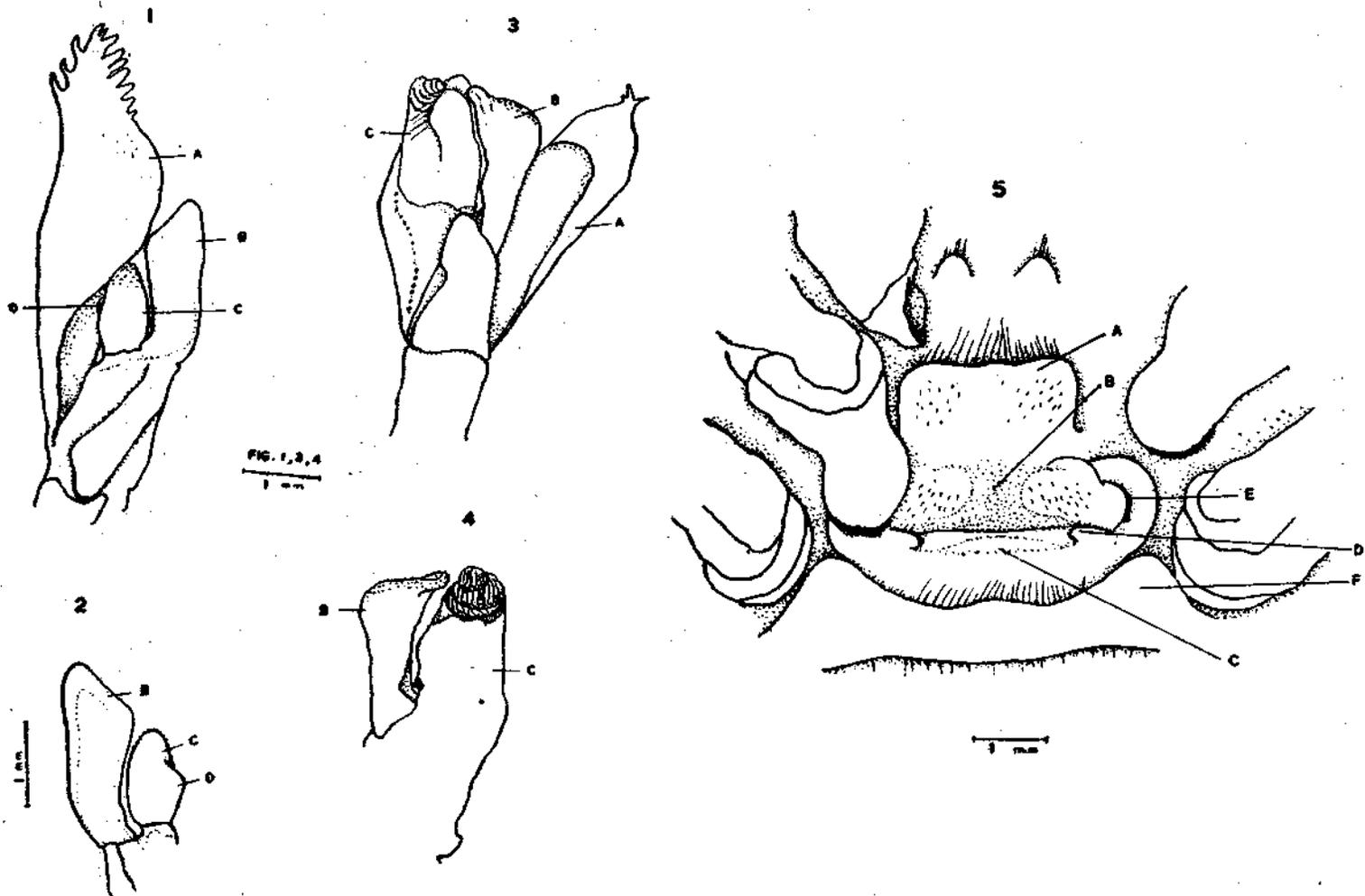
GENERAL REMARKS ON THE GENUS

The genus *Metapenaeopsis* established by Bouvier (1905) was redefined as a subgenus of *Penaeopsis* Bate by Burkenroad (1934). Kubo (1949) elevated it again to generic rank. Racek and Dall (1965) have listed 28 species of the genus from the Indo-West Pacific region. De Bruin (1965) has added two more species and quite recently Racek (1967) described yet another. The genus has two main divisions, one group having stridulating ridges on the carapace and the other without. The stridulating species had been greatly confused in taxonomic literature. Thanks to the excellent works of Hall (1961, 1962) and Racek and Dall (1965), ten stridulating species are now recognised. The latter authors have critically reviewed the stridulating species described earlier and added two new species.

However, in trying to identify the two closely related stridulating species *Metapenaeopsis stridulans* (Alcock) and *M. barbata* (De Haan) in the present collection it was found that the highly complex characters of the petasma and thelycum of the genus have not been fully exploited for taxonomic purposes. So far the most detailed descriptions of the structures are given by Kubo (1949) and Racek and Dall (1965). The present observations show that in the case of the petasma, in addition to certain differences described by the above authors, some of the six component parts of the distal piece depict specific differences which could be very useful in identification. Similarly in the case of females it is found that distinctly shaped grooves and openings which are highly characteristic and constant for each species are present underneath the coxal plates of the 4th pereopods. These grooves lead into the seminal receptacles. Although these grooves are clearly shown in the excellent figures of the thelycum given by Hall (1962) he makes no mention of these in the descriptions. A closer examination of his figures would show that each of the four stridulating species depicted by him has a distinctive configuration of grooves under the coxal plates of the 4th legs. It is suggested that these features also may prove to be very reliable criteria in the diagnosis of the stridulating species of *Metapenaeopsis*.

The detailed structure of the petasma and thelycum of *M. stridulans* (Alcock) and *M. barbata* (De Haan) are figured and described below to illustrate the usefulness of these criteria.

Metapenaeopsis barbata (De Haan). The dorsal and ventral views of the distal half of the left petasmal endopod are shown in Figs. 1 and 2. The left distoventral projection (Fig. 1A) is triangular distally bearing 8-9 short processes on the median margin and 3-4 longer processes on the outer margin. The inner intermediate strip (Figs. 1 and 2B) which is about twice as long as the outer is thin



FIGS. 1-5. *Metapenaeopsis barbata* (De Haan), distal half of the left petasml endopod—FIG. 1—dorsal view ; FIG. 2—ventral view. Distal half of the right petasml endopod ; FIG. 3—dorsal view ; FIG. 4—ventral view ; FIG. 5—theelycum.

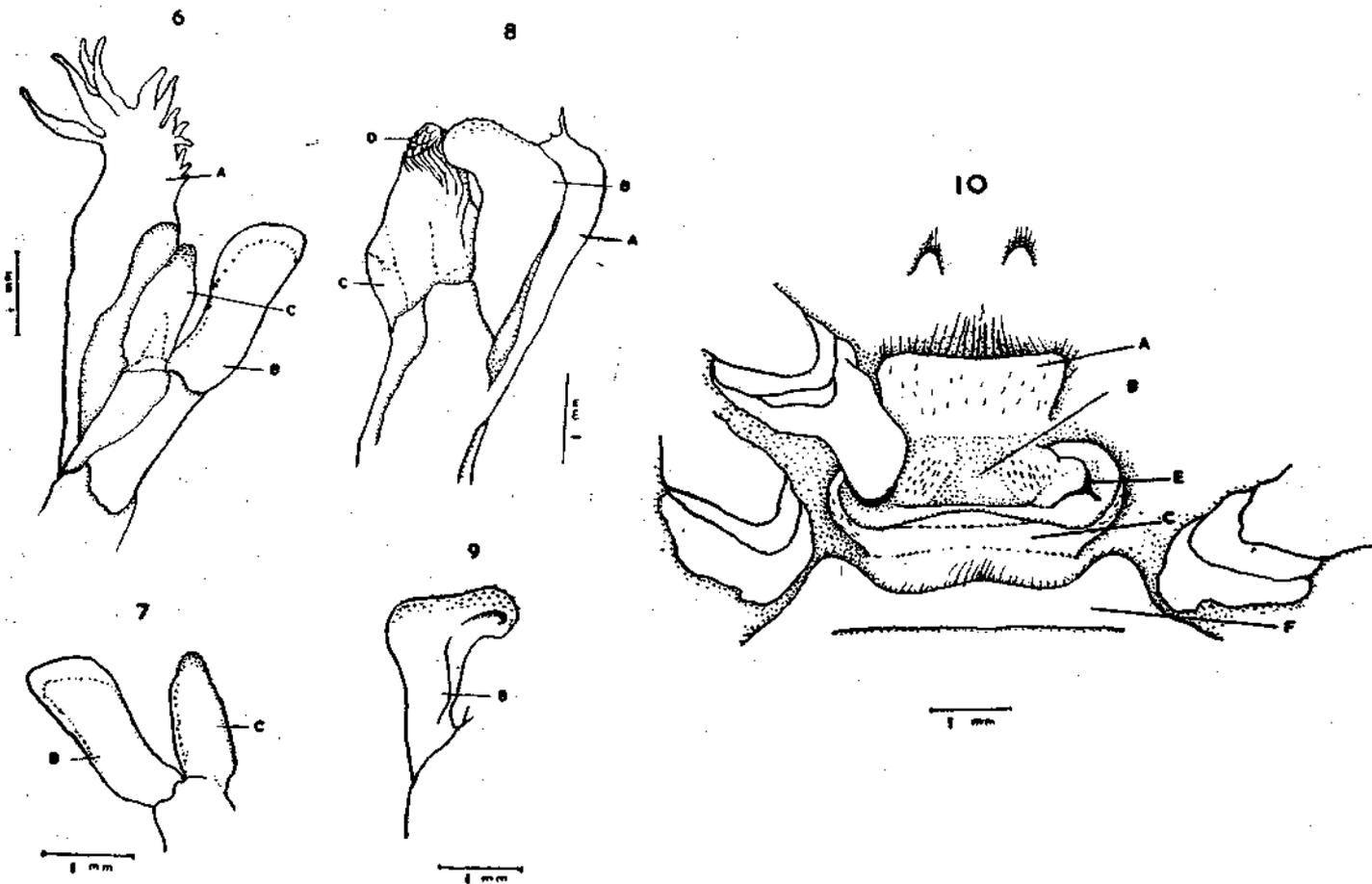
and leaf-like. The outer intermediate strip (Figs. 1 and 2C) is oval in shape with the surface sculptured by low irregularly hexagonal ridges and the distal end covered with minute tubercles; a small triangular lobe projects ventrolaterally from the outer margin of this oval plate (Figs. 1 and 2D).

The dorsal and ventral views of the distal half of the right petasmat endopod are shown in Figs. 3 and 4. The right distoventral projection (Fig. 3A) is tipped with a protuberance with 3 spinules. The distomedian lobule (Figs. 3 and 4B) is a little broader anteriorly and ends in a slightly twisted anteromedian projection. The surface of the lobule is sculptured and the anterior margin has minute tubercles. The distoventral flap (Figs. 3 and 4C) is truncately conical and distally spirally convoluted.

The thelycum is shown in Fig. 5, the coxal plate of the left 4th pereopod being lifted up and displaced to reveal the grooves underneath. The anterior thelycal plate (Fig. 5A) is broader than long with rounded and elevated anterolateral corners, the anterior border having a small median prominence. The intermediate plate (Fig. 5B) which is slightly sunken compared to the rest of the thelycum has slightly raised lateral swellings sparsely covered with setae; posteriorly a shallow transverse groove separates it from the anterior sternal plate (Fig. 5C) which has an ill-defined median convexity. Two small semicircular prominences (Fig. 5D) overhang the lateral ends of the transverse groove of the intermediate plate referred to above. The elevated lateral margins of the anterior sternal plate curve forward anteriorly in the form of a crescent. Between this crescent-like forward extension of the anterior sternal plate and the lateral margin of the intermediate plate is a crescent-shaped opening (Fig. 5E) which leads into the seminal receptacle. The posterior horn of the crescentic opening joins the lateral end of the shallow transverse groove of the intermediate plate. The semicircular lateral prominence on the anterior sternal plate actually overhangs this junction. The anterior horn of the crescentic opening is continued by a narrow medially curved crescentic groove which apparently defines the anterolateral border of the intermediate plate. The posterior sternal plate (Fig. 5F) has two prominent lateral lobes and a smaller median elevation. The posterolateral borders of the coxal plate of the 4th pereopods possess close-set stiff bristles.

Metapenaeopsis stridulans (Alcock). The dorsal and ventral views of the distal half of the petasmat endopod are shown in Figs. 6 and 7. The triangular distal extremity of the left distoventral projection (Fig. 6A) bears 4 very long filiform processes on the outer margin and 8-9 smaller finger-like processes on the median margin. In younger specimens the outer processes are not filiform (see Fig. 4 of Racek & Dall, 1965). The shape of the thin leaf-like inner intermediate strip (Figs. 6 & 7B) is more or less similar to that of *M. barbata*, but it is slightly twisted instead of being flat. The outer intermediate strip (Figs. 6 & 7C) is more elongated than in *M. barbata* and reaches more than 2/3 length of the inner strip. The surface of the outer strip is sculptured and the distal end covered by minute tubercles. The triangular lobe on the outer margin is absent.

The right distoventral projection (Fig. 8A) is tipped with 2 spines, one long and the other minute. The flat and sculptured distomedian lobule (Fig. 8B) is produced anteromedially into a rounded lobe; in the ventral view (Fig. 9) this lobe has a shallow excavation into which fits the tip of the distoventral flap. This flap is shown slightly displaced in Fig. 8C to bring out its shape clearly. The convoluted



FIGS. 6-10. *Metapenaeopsis stridulans* (Alcock), distal half of the left petasma—FIG. 6—dorsal view; FIG. 7—ventral view. Distal half of the right petasma; FIG. 8—dorsal view; FIG. 9—ventral view; FIG. 10—thelycum.

spiral is conical and bears 3-4 teeth-like thickenings (Fig. 8D) on the distal median border. These teeth are absent in *M. barbata*.

The thelycum (Fig. 10) is similar to that of *M. barbata* in general pattern. The anterior margin of the thelycal plate is entire. But in specimens 10 mm. and below in carapace length this plate is semicircular in shape with a mucronate tip; this condition obtains in juvenile *M. barbata* also. The intermediate plate has more prominent lateral elevations covered by setae and the posterior transverse groove is also deeper and well marked compared to the condition in *M. barbata*. The anterior sternal plate is also more elevated in its entire course and lacks the semicircular lateral prominences found in *M. barbata*. The opening of the seminal receptacle is triradiate with the anterior arm curving medially; the posterior inner arm is continuous with the lateral end of the posterior transverse groove on the intermediate plate. The rounded lateral lobes of the posterior sternal plate are less prominent.

Thus in the nature of the outer intermediate strip, the number of spines at the distal end of the right distoventral projection, the nature of the distomedian lobule and the distoventral flap etc. in the petasma and in the nature of the grooves underneath the coxal plates of the 4th peracopods in the female there are clear differences between the two species. It is felt that these characters would be of great use in identifying the species. In this connection it would be worthwhile if a study of the same characters in the other stridulating species of *Metapenaeopsis* is made.

The authors are thankful to Mr. K. H. Mohamed for a critical reading of the manuscript.

REFERENCES

- BURKENROAD, M. D. 1934. Littoral Penaeidae chiefly from the Bingham Oceanographic collections with a revision of *Penaeopsis* and descriptions of two new species. *Bull. Bingham Oceanogr. Coll.*, 4 (7) : 1-109.
- HALL, D. N. F. 1961. The Malayan Penaeidae (Crustacea, Decapoda) Part II. Further taxonomic notes on the Malayan species. *Bull. Raffles Mus. Singapore*, 26 : 76-119.
- 1962. Observations on the taxonomy and biology of some Indo-West Pacific Penaeidae (Crustacea, Decapoda). *Colonial Office Fish. Pub.*, London 17 : 1-229.
- KUBO, I. 1949. Studies on the penaeids of Japanese and its adjacent waters. *J. Tokyo Coll. Fish.*, 36 (1) : 1-467.
- RACEK, A. A. 1967. A new species of *Metapenaeopsis* (Crustacea-Decapoda) from Northern Australian waters. *Proc. Linn. Soc. New South Wales*, 92 (3) : 251-53.
- & DALL, W. 1965. Littoral Penaeidae (Crustacea, Decapoda) from Northern Australia, New Guinea and adjacent waters. *Verhand. koninkl. Nederlandse Akad. Wetensch.*, 56 (3) : 1-116.