PROCEEDINGS

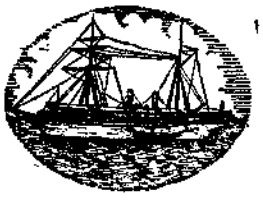
SYMPOSIUM ON CRUSTACEA

HELD AT

ERNAKULAM

FROM JANUARY 12 TO 15, 1965

PART I



SYMPOSIUM SERIES 2

MARINE BIOLOGICAL ASSOCIATION OF INDIA

MARINE FISHERIES P.O., MANDAPAM CAMP

INDIA

ON A COLLECTION OF PENAEID PRAWNS FROM THE OFFSHORE WATERS OF THE SOUTH-WEST COAST OF INDIA*

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ABSTRACT

13 species of penaeid prawns collected during the exploratory and research cruises of *M. V. Kalava* and *R. V. Varuna* respectively in 1962 and 1963 from the offshore waters of south-west coast of India are recorded. Of these, 8 are recorded for the first time from this region.

EXPLORATORY trawl fishing conducted by the vessels of the Indo-Norwegian Project *M. V. Kalava* and the Research Vessel *Varuna* during 1962 and 1963 in the offshore waters of Cochin and Alleppey upto 205 fathoms caught a large number of prawns. Some of these proved to be new records for this area and are reported here. Trawl operations of *M. V. Kalava* were conducted during these cruises mostly in the 160–200 fathom depths off South-West of Cochin. But *Varuna* operated in shallow waters upto 50 fathoms off North-West of Cochin. One or two species caught in the trawl nets of the small mechanised fishing vessels operating in the 5 to 10 fathom area off Cochin are also included.

Tribe **PENAEIDEA**

Family PENAEIDAE Bate

Subfamily SOLENOCERINAE Wood Mason and Alcock

***Solenocera pectinata* (Bate)**

Philonicus pectinatus Bate 1888, p. 279.

Philonicus cervicalis Zehntner 1894, p. 210.

Solenocera pectinata de Man, 1911, pp. 45–47.

Solenocera pectinata Anderson and Lindner, 1943, p. 286.

Solenocera pectinata Nataraj, 1945, p. 96.

Solenocera pectinulata Kubo, 1949, pp. 251–255.

Solenocera pectinata Hall, 1961, p. 80; 1962, p. 13.

Material: Seven males, 24–32 mm. and 7 females, 26–36 mm.

Locality: Arabian Sea, off Cochin (Lat. 9° 55′ N. and Long. 75° 50′ E.) and N.W. of Cochin off Ponnani (Lat. 10° 35′ N. and Long. 75° 20′ E.)—25–50 fathoms.

Distribution: Arafura Sea, south of Papua (Bate), Flores Sea, Ceram Sea and Buton Strait—32–95 m. (de Man), Kumanonada off Owase, Japan—350 m. (Kubo), Arabian Sea (Nataraj) and South China Sea (Hall).

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** Present Address: Central Marine Fisheries Research Substation, Ernakulam.

Remarks: The post-rostral carina does not extend beyond the cervical groove and interrupts the same at 0·55 length of carapace. The vertical groove connecting the hepatic spine and the post-orbital spine is very distinct. The antennular peduncles are 0·55 of the length of the carapace. The outer distal margin of the exopod of the uropod is without spine. The petasma is very much as described by Kubo (1949) for *Solenocera pectinulata*, with the distal third of the lateral margin fringed with fine setae regularly increasing in length distalwards.

Solenocera koelbeli de Man

Solenocera distincta Koelbel, 1884, p. 314.

Solenocera koelbeli de Man, 1911, p. 48.

Solenocera distincta Balss, 1914, pp. 5–6.

Solenocera koelbeli Anderson and Lindner, 1943, p. 286.

Material: One male, 66 mm. and 5 females, 60–79 mm.

Locality: Arabian Sea, N.W. of Cochin off Ponnani (Lat. 10° 35′ N., and Long. 75° 20′ E.)—35–40 fathoms.

Distribution: Koelbel recorded the species from Japan and this is the first record of the species from Indian waters.

Remarks: Rostrum rather short and armed with 7–8 teeth on upper border, anterior three teeth on the rostrum proper. Pterygostomian spine absent. Cervical groove not interrupted by the post-rostral carina. Antennal peduncle almost reaching apex of antennal scale. De Man has observed that the third maxilliped extends only to the apex of the antennal scale, but in the present specimens the third maxillipeds overreach the distal ends of the antennal scale by the length of the dactylus as in *S. brevipes* (Kubo, 1949). The fifth pereiopod reaches beyond the tip of the antennal scale by about $\frac{1}{3}$ of the length of the propodus and dactylus.

As mentioned by Burkenroad (1934 *a*), in synonymising *S. koelbeli* with *S. distincta* (De Haan, 1850), Balss (1914) apparently overlooked the fact that de Man (1911) had confirmed the occurrence of a pterygostomian spine in the type of the latter.

Solenocera hextii Wood Mason

Solenocera hextii Wood Mason, 1891, p. 275.

Solenocera hextii Alcock, 1901, pp. 20–21.

Solenocera hextii de Man, 1911, p. 7.

Solenocera hextii Ramadan, 1938, p. 56.

Solenocera hextii Anderson and Lindner, 1943, p. 286.

Material: One male, 55 mm. and 2 females, 138 and 109 mm.

Locality: Arabian Sea, S.W. Cochin off Alleppey (Lat. 9° 25′ N. and Long. 75° 40′ E.)—185–200 fathoms.

Distribution: Bay of Bengal—65–276 fathoms and Arabian Sea from Indus delta to the Malabar Coast—108–124 fathoms (Wood Mason and also Alcock), Gulf of Aden—186 m. and South Arabian Coast—201–274 m. (Ramadan). The present report extends the distribution of the species further south on the S.W. coast of India.

Remarks: Rostrum is ascendant and dorsally armed with 7–8 teeth, extending to the end of the basal joint of the antennular peduncle. Antennular flagella ⅔ the length of carapace. The 'L' shaped groove on the branchiostegal region of the carapace is conspicuous. The characteristic spine on the cervical groove ventral to the posteriormost spine of the rostral series is present. Telson is trifurcate and almost as long as the exopod of the uropod. Anderson and Lindner (1943) included this species in the group with tooth or spine absent on the outer distal margin of the exopod of the uropod. But in the present specimens these spines are present. The thelycum is quite similar to that of *S. alticarinata* described by Kubo (1949).

Hymenopenaeus aequalis (Bate)

Haliporus equalis Spence Bate, 1888, pp. 285–286.

Haliporus aequalis de Man, 1911, pp. 32–33.

Hymenopenaeus aequalis Kubo, 1949, pp. 219–222 (with synonymy).

Material: One female, 71 mm.

Locality: Arabian Sea, S.W. of Cochin off Alleppey (Lat. 9° 25' N. and Long. 75° 40' E.), 185 fathoms.

Distribution: Between Philippine Islands and Borneo—250 fathoms (Bate), Andaman Sea and off Ceylon (Alcock), near Kei Islands and Bali Sea—538–560 m. (de Man), S.W. coast of India—237 fathoms (Kemp), East Coast of Africa—628–1362 m. (Balss) and Kumanonada and Heta in Japan—200–450 m. (Kubo).

Remarks: Except in minor variations the descriptions of de Man (1911) and Kubo (1949) clearly apply to the present specimen. In de Man's specimens the rostrum reaches the distal end of the 2nd segment or the middle of the terminal joint of the antennular peduncle. But in the specimens described by Kubo (*op. cit.*) it extends to about ½ the length of the 2nd segment of the peduncle. In the present specimen the rostrum extends to the middle of the terminal joint. The fact that the 'Siboga' specimens as well as the present one are females whereas Kubo's specimens were males might explain this difference in this feature. Unlike as described by de Man and Kubo, in the present specimen the rostral teeth formula is 8 + 2 as against 7 + 2. The abdominal segments 4–6 are dorsally carinated.

Subfamily ARISTAEINAE Alcock

Aristeus semidentatus (Bate)

Hemipenaeus semidentatus Bate, 1888, p. 305.

Aristeus semidentatus de Man, 1911, pp. 29–31.

Aristeus semidentatus Ramadan, 1938, p. 40.

Not *Aristeus semidentatus* Alcock, 1901, and Kemp and Sewell, 1912 (*Aristeus alcocki* Ramadan, 1938) and *Aristeus semidentatus* Balss, 1925 (*Aristeus mabahissae* Ramadan, 1938).

Material: Three males, 86, 82 and 90 mm. and several females varying in lengths from 100 to 178 mm.

Locality: Arabian Sea, S.W. Cochin off Alleppey (Lat. 9° 25' N. and Long. 75° 40' E.)—180–205 fathoms.

Distribution: Near Kermadec Islands and off Banda (Bate), and near Kei Islands—560 m. (de Man). This species is reported for the first time from Indian waters.

Remarks: The specimens on hand tally well with the descriptions of the 'Challenger' and 'Siboga' material. They differ from *A. semidentatus* Alcock (*A. alcocki* Ramadan, 1938) in the nature of the pleurobranchiae on segments X–XIII. These branchiae in the present specimens are not mere papillae but distinct filaments provided with pinnules. However, the buttress of the pterygostomian spine is not so very long. The chelae of the first three pairs of pereiopods are shorter in proportion to the carpus than in *A. alcocki*. In the male the inner edge of the merus of the first leg is concave which is a distinctive feature of *A. semidentatus* according to Ramadan (*op. cit.*). There is no median spine on the posterior edge of the third abdominal segment and in this character as well as in the comparative lengths of the chelae of the legs it differs from *A. mabahissae*. Movable spines are present on the meri of the first and second legs. The females of this species were present in varying numbers in several of the hauls made during the cruises of *M. V. Kalava*. The numbers varied from few to 50 or 60 per haul. In the catches of these cruises this species comes second in the order of abundance. The possibility of catching this on a commercial basis is worth exploring.

Aristeus alcocki Ramadan

Aristeus semidentatus Alcock, 1901, p. 31.

Aristeus semidentatus Kemp and Sewell, 1912, p. 19.

Aristeus alcocki Ramadan, 1938, pp. 40–42.

Material: One female, 141 mm. (with spermatophore in tact).

Locality: Arabian Sea, S.W. of Cochin off Alleppey (Lat. 9° 25′ N. and Long. 75° 40′ E.)—185 fathoms.

Distribution: Bay of Bengal—193–594 fathoms and Arabian Sea near the Laccadives and Cape Comorin—224–487 fathoms (Kemp and Sewell, and Alcock), and Gulf of Aden—270–1051 m. (Ramadan). The present report extends the distribution of the species slightly north in the Arabian Sea in lesser depths.

Remarks: The single specimen obtained agrees well with the description of Alcock and Ramadan especially in the nature of the minute pleurobranchiae on segments X–XIII, the position of the branchio-hepatic groove, the glabrous integument, etc. However, Ramadan (*op. cit.*) observed mobile spinules on the meri of the first and second legs only. But the specimen on hand posseses these spinules on the meri of all the three legs. In the length of the pereiopods also there is slight difference from Ramadan's descriptions. The third pereiopod slightly overreaches the tip of the antennal scale, and the fourth and the fifth legs reach beyond the scaphocerite by the length of the dactylus.

Aristaeomorpha wood-masoni Calman

Aristeomorpha wood-masoni Calman, 1925, p. 8 (with synonymy).

Aristeomorpha wood-masoni Burkenroad, 1936, p. 85.

Aristeomorpha wood-masoni Ramadan, 1938, p. 53.

Aristaeomorpha rostridentata Kubo, 1949, p. 206.

Aristaeomorpha wood-masoni Barnard, 1950, p. 627.

Material: One male, 107 mm. and 1 female, 112 mm.

Locality: Arabian Sea, S.W. of Cochin off Alleppey (Lat. 9° 25′ N. and Long. 75° 40′ E.)—180–205 fathoms.

Distribution: Bay of Bengal and Andaman Sea—271 fathoms (Kemp and Sewell, and Alcock), and South-East Australia (Calman). This is the first report of the species from the Arabian Sea.

Remarks: The most important character which distinguishes this species from *A. foliacea* is the nature of the pterygostomian region (*cf.* Kemp and Sewell, 1912; Calman, 1925; and Kubo, 1949). In both the specimens on hand the length of the pterygostomian area is only a little over twice its greatest breadth, whereas in *A. foliacea* the length of this region is from 3 to 4·5 times its breadth. The specimens agree well with the descriptions of Alcock and Calman. The telson reaches the tip of the endopodite of the uropod. Rostrum of the male is armed with 10 teeth. In the female obtained the rostrum is broken. The tips of the fourth and fifth pairs of pereiopods of both specimens are missing. Petasma is subtrapezoid in outline with the outer margin straight and longer than the inner. The thelycum consists of shield-shaped plates on the sternites between fourth and fifth pereiopods. Sternites of abdominal segments 1–3 with apically sharp median elevation successively decreasing in length.

Subfamily PENAEINAE Burkenroad

***Parapenaeus investigatoris* Alcock and Anderson**

Parapenaeus investigatoris Ramadan, 1938, p. 73.

Parapenaeus investigatoris Kubo, 1949, pp. 406–408 (with synonymy).

Parapenaeus investigatoris Barnard, 1947, p. 382.

Parapenaeus investigatoris Barnard, 1950, pp. 602–604.

Material: Four males, 76, 70, 73 and 73 mm. and 1 female, 79 mm.

Locality: Arabian Sea, S.W. of Cochin off Alleppey (Lat. 9° 25′ N. and Long. 75° 40′ E.)—175–185 fathoms.

Distribution: Off Pulicat, Gulf of Mannar and Andaman Sea N.E. and North of North Island—133–419 fathoms (Alcock), near Kei Islands—310 m. (de Man), Gulf of Aden—220 m. (Ramadan), off Maisaku, Japan—300 m. (Kubo), and off Cape Natal, Durban—185 fathoms (Barnard). This is the first record of the species from the Arabian Sea.

Remarks: The specimens on hand quite agree with the descriptions and figures given by previous authors. Rostrum slightly tilted upward but showing a distinct concavity dorsally and armed with 6–7 teeth in addition to the epigastric tooth placed at $\frac{1}{3}$ the length of the carapace from the anterior, overreaching the eye in the female but a little shorter in male. Epipodites absent on the last three pereiopods. The 5th pereiopod extends to $\frac{3}{4}$ the length of the scaphocerite. The 6th pleon segment is a little over twice the length of the 5th segment and longer than the telson by $\frac{1}{3}$ of its length. The telson is much shorter than the endopodites of the uropod.

***Parapenaeus longipes* Alcock**

Parapenaeus longipes Alcock, 1905, p. 525.

Parapenaeus longipes Alcock, 1906, p. 33.

Parapenaeus longipes de Man, 1911, pp. 81–82.

Parapenaeus longipes Kubo, 1951, pp. 259–263; Racek & Dall, 1965, pp. 52·53.

Material: Two males, 53 and 55 mm.

Locality: Arabian Sea, S.W. of Cochin (Lat. 9° 55′ N. and Long. 76° 10′ E)—10 fathoms.

Distribution: Off Ganjam Coast, Vizagapatam, Mangalore (Malabar Coast) and Sand Heads—7–35 fathoms (Alcock), Madura Strait, Bay of Bima, Timor Sea and Java Sea—55–88 m. (de Man), Kii Channel, Japan—60 m. (Kubo) and New Guinea (Racek & Dall). The present report extends the distribution of the species further south on the South-West coast of India.

Remarks: Rostrum reaching just beyond the eyes with a concavity dorsally and armed with 6 + 1 teeth in both specimens. As described by de Man (1911) and Kubo (1951) the second segment of the antennal peduncle is twice as long as the third instead of 1·5 times as figured by Alcock (1905). The third maxilliped reaches the tip of the antennal scale according to the description of both Alcock and Kubo. In one of the present two specimens the pediform external maxilliped reaches the tip of the antennal scale, but in the other it is slightly shorter. The fifth pair of legs reaches almost the end of the antennal scale according to de Man. But both Alcock and Kubo describe the fifth leg as reaching a dactylus length beyond the antennal scale, which is the case in the present specimens also. The petasma is typically as described by Kubo with the process on the dorsal lateral border of the median lobe directed backwards.

Penaeopsis rectacuta (Bate)

Penaeopsis rectacutus Ramadan, 1938, pp. 67–68.

Penaeopsis rectactus Kubo, 1949, pp. 322–326 (with synonymy).

Penaeopsis rectacuta Hall, 1962, p. 18.

Penaeopsis rectacutus Kurien, 1964, p. 216.

Material: This species is present in almost all the hauls made during the cruises of *M. V. Kalava* operating trawls in depths 160–205 fathoms in varying numbers, sometimes amounting to 10–15 kg. per haul. The males ranged from 70–105 mm. in size and females which outnumbered the males on all occasions ranged from 75 to 115 mm.

Locality: Arabian Sea, S.W. (Lat. 9° 25′ N. and Long. 75° 40′ E.) and N.W. (Lat. 10° 40′ N. and Long. 74° 50′ E) off Cochin—160–205 fathoms.

Distribution: Fiji Islands and Philippines (Bate), off Pulicat, Madras, South of Port Blair, Andaman and North of North Andaman Island—145–419 fathoms (Alcock), Bali Sea and Makassar Strait—289–521 m. (de Man), Nicobar Islands (Balss), off Owase and Tenryugawa, Japan (Yokoya), Gulf of Aden—186 m. (Ramadan), Kumanonada off Owase, Japan—400 m. (Kubo) and South China Sea (Hall). Recently Kurien (1964) reported this species from the Arabian Sea off Kerala coast. He gives the distribution of this species in the area as from North of Cochin to Calicut. But in the present collection it was obtained from south of Cochin also.

Remarks: Kubo (1949) has spelt the specific name of this species as *rectactus*. In quoting the other authors also he gave the same spelling whereas in the references quoted by him the spelling is actually *rectacutus*. Evidently Kubo's *rectactus* appears to be a spelling mistake. The present specimens argee well with the descriptions of previous authors.

Among the prawns present in the catches of all these exploratory cruises this species is perhaps the only one which is caught in comparatively large numbers. The catches of this species varied from ½ to 15 kg. per haul of 1 hour duration. But the size of the prawn as shown above is quite small and not very suitable for the freezing industry. Nevertheless, the possibility of exploiting this species for commercial purposes is worth considering. But factors like the depth from which it is caught and the consequent increased expenses involved in the fishing operations at such depths and the smaller size of the prawn point to its unsuitability for commercial exploitation. However, further exploratory fishing in slightly lesser depths may prove to be useful in determining their presence in larger quantities at such depths.

Metapenaeopsis andamanensis (Wood Mason)

Metapenaeus philippinensis var. *andamanensis* Wood Mason, 1891, p. 271.

Penaeus (*Metapeneus*) *coniger* var. *andamanensis* Alcock, 1901, p. 17.

Metapeneus coniger var. *andamanensis* Alcock, 1906, p. 27.

Penaeopsis coniger var. *andamanensis* de Man, 1911, pp. 61–62.

Metapenaeopsis coniger Kubo, 1949, pp. 432–434.

Metapenaeopsis andamanensis Hall, 1961, pp. 109–110; 1962, pp. 35–36.

Material: Fifteen specimens, 6 males, 89–100 mm. and 9 females, 90–111 mm.

Locality: Arabian Sea, S.W. of Cochin (Lat. 9° 25′ N. and Long. 75° 40′ E.)—150–200 fathoms.

Distribution: East of North Andaman Island, off Port Blair, off Cape Comorin and Andaman Sea—100–244 fathoms (Alcock), Bali Sea, Madura Bay and Kei Islands—54–310 m. (de Man), Japan 150–230 m. (Kubo) and Northern Malacca Straits—87 fathoms (Hall). The present record extends the distribution of the species further north in the Arabian Sea.

Remarks: As observed by Hall (*op. cit.*) the rostrum armed with 6 — 7 + 1 teeth is more or less horizontally straight and not uptilted as described by Alcock (*op. cit.*). The subcarinae of fourth to sixth abdominal terga are indistinct. Like the Malayan species the branchiostegal spines are well developed and telson is shorter than the exopods of the uropod. Sharply pointed spine is also present on the outer distal margin of the basicerite. The small basial spines reported to be present on the second legs of the 'Siboga' and Malayan specimens are not found in the present specimens.

Trachypenaeus curvirostris (Stimpson)

Trachypenaeus curvirostris Ramadan, 1938, p. 63.

Trachypenaeus curvirostris Dall, 1957, pp. 203–206.

Trachypenaeus curvirostris Kunju, 1960, p. 83; Racek and Dall, 1965, p. 89.

Trachypenaeus curvirostris Hall, 1961, pp. 98–100 (with synonymy); 1962, p.29.

Material: Eighteen males, 42–70 mm. and 35 females, 54–92 mm.

Locality: Arabian Sea, S.W. of Cochin (Lat. 9° 55′ N. and Long. 75° 50′ E)—22–25 fathoms and N.W. of Cochin off Ponnani (Lat. 10° 35′ N. and Long. 75° 20′ E.)—35–40 fathoms.

Distribution: Detailed distribution of the species is given by Kubo (1949). Later Racek (1955) and Dall (1957) reported this species from Australia, the former from New South Wales and Moreton Bay and the latter from off Point Lookout, Queensland—20–30 fathoms. Kunju (1960) recorded the same from northern part of the Arabian Sea off Sassoon Docks, Bombay—6–7 fathoms. Recently Hall (1961) reported it from Singapore—17–45 fathoms. The present record extends the distribution of this species to southern coast of the Arabian Sea.

Remarks: In general there is very close agreement between the present specimens and the various descriptions published previously. Minute ischial spines of the first pereiopods overlooked by de Man (1911) are said to be present in Kubo's specimens. Ramadan (*op. cit.*) did not find these ischial spines on the first leg of his specimens and observed that no great importance should be given to this character in separating the section as done by Burkenroad (1936). However, in the present

specimens these spines are present even though they are very minute and visible only under very high magnification. Dall (*op. cit.*) also observes the presence of small ischial spine on first leg of his specimen. There is no spine on the basis of the third maxilliped. Unlike Kubo's specimens fifth legs of the present specimens extend to the tip of the antennal scale. Third legs also extend to the same length as the fifth.

Subfamily Sicyoninae Ortmann

Sicyonia lancifer (Olivier)

Sicyonia lancifer de Man, 1911, pp. 123–124 (with synonymy).

Eusicyonia lancifer Kubo, 1949, pp. 439–444.

Eusicyonia lancifer Kurien, 1953, p. 761.

Sicyonia lancifer Hall, 1961, p. 112; 1962, p. 37.

Material: One male, 36 mm.

Locality: Arabian Sea, off Cochin (Lat. 9° 55′ N. and Long. 75° 55′ E.)—17 fathoms.

Distribution: "Mer des Indes", Arafura Sea, Kagoshima, Japan, Penang and Pearl banks, Gulf of Mannar, Ceylon. Kurien (1953) recorded the species from Arabian Sea off Trivandrum from 12 to 15 fathoms. The present record extends the distribution of the species further north in the Arabian Sea.

Remarks: Rostrum reaches the end of the third segment of the antennular peduncle. The postrostral carina is armed with 5 teeth. The hepatic spine is quite strong. The abdominal pleura of first and second segments are unispinose, while the third, fourth and fifth are armed with three spines. In the 'Siboga' specimens in all the chelate legs the fingers are one and half times as long as the palm. But in the present specimen this feature is more in agreement with the figures of Bate in that in one or two pairs at least the fingers are not much longer than palm. The first pair of thoracic legs extends to the middle of the scaphocerite whereas the third pair reaches with their fingers beyond the tip of the latter.

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