Four new species of the genus *Rhopalophthalmus* (Mysidacea: Crustacea) from the northwest coast of India

S. U. PANAMPUNNAYIL & A. BIJU

National Institute of Oceanography, Regional Centre, Kochi, India

(Accepted 25 July 2006)

**Abstract**

Four species belonging to the genus *Rhopalophthalmus*—*R. mumbayensis*, *R. anishi*, *R. murudana*, and *R. vijayai*—are described as new to science. All four species are distinguishable from each other and from other related species by the combination of characters afforded by the number of spines on the antennal sympod, number of carpopropodal segments of the thoracic endopods, relative length of the vestigial endopod of the eighth thoracic limb, number of lateral spines on the telson, and the relative length of the distal spines.

**Keywords:** Crustacea, India, Mysidacea, new species, Rhopalophthalmus, taxonomy

**Introduction**

The genus *Rhopalophthalmus* was instituted by Illig (1906) for the reception of type species *R. flagellipes* captured by the S.S. *Valdivia* off Banana in the Congo Estuary. Of the 18 species which have up to the present been referred to this genus, only five species—*R. chilkensis* Tattersall, 1957, *R. kempi* Tattersall, 1957, *R. tattersallae* Pillai, 1961, *R. indicus* Pillai, 1961 and *R. macropsis* Pillai, 1964—have been recorded from Indian waters. By the present work four more species, *R. mumbayensis*, *R. anishi*, *R. murudana*, and *R. vijayai*, have been added to the list, which are all new to science. The study area included coastal waters off Murud, Daman, Dahej and creeks around Mumbai (Dharamtar, Thane, Bassein, Kasheli). Currents within the creek system are almost entirely due to the tidal ebb and flow and the temporal and spatial variations in salinity are governed by the quantum of sea water influx and the riverine fresh water flow. The interior part of this complex creek system is fringed by rich mangrove vegetation and salt marsh and receives large quantities of waste water, thereby enhancing the nutrient level which in turn supports high plankton production. Kasheli, the area of study, is the mid-estuarine zone of Ulhas estuary. The materials were collected with a Heron Tranter Net (Tranter et al. 1972) having a mouth area of 0.25 m² and a mesh size of 0.33 mm. The common and specific characteristics of the known species of *Rhopalophthalmus* from the coastal waters of India are given in Table I. All the type specimens are stored in the reference collection of the Indian Ocean Biological
Table I. Common and specific characteristics of species of *Rhopalophthalmus* from the coastal waters of India.

| Characteristic                              | R. chilkensis | R. kempi | R. indicus | R. tattersallae | R. macropsis | R. mumbayensis sp. nov. | R. anishi sp. nov. | R. murudana sp. nov. | R. vijayai sp. nov. |
|--------------------------------------------|---------------|----------|------------|----------------|--------------|------------------------|-------------------|---------------------|---------------------|
| Presence of nodules on carapace             | –             | –        | +          | +              | +            | +                      | +                 | +                   | +                   |
| Spines on antennal sympod                  | 3 Subsimilar  | 4 Two long and two short | 5 Dissimilar arranged like a cone | 4 Two long and two short. Third spine with strong barbs | 4 Two long and two short | 4 Two long and two short | 4 Two long and two short | 4 Two long and two short | 4 Two long and two short |
| Propodal segments of thoracic endopods      | 3–5           | 2        | 4–5        | 3              | 4            | 4–6                    | 2–4               | 2–3                 | 3–5                 |
| Eighth thoracic endopod of male             | Longer than basal segment of exopod | Longer than basal segment of exopod | Shorter than basal segment of exopod | Shorter than basal segment of exopod | Shorter than basal segment of exopod | Shorter than basal segment of exopod | As long as basal segment of exopod | Shorter than basal segment of exopod | Shorter than basal segment of exopod |
| Eighth thoracic endopod of female           | Shorter than basal segment of exopod 15–16 | Longer than basal segment of exopod | As long as | Shorter | Shorter | Shorter | As long | Shorter | Shorter |
| Number of spines on lateral margin of telson| 14            | 14       | 13         | 12             | 11–12        | 11                     | 15–16             | 11                  | 7                   |
| Apical spines of telson                    | Inner pair long 9–11.4 | Inner pair long 10.2 | Outer pair long 15–17 | Inner pair long 13.3 | Outer pair long 7.8 | Outer pair long 8–12 | Outer pair long 9.6–11.7 | Inner pair long Sub-equal |
| Length of adult (mm)                        | 1390          |          |            |                |              |                        |                   |                     |                     |
Centre (RC, NIO, Kochi). The descriptive terminology employed follows to a great extent Pillai (1973).

**Genus Rhopalophthalmus** Illig, 1906

*Rhopalophthalmus mumbayensis* sp. nov.

(Figures 1–27)

**Material**

Holotype: adult male (IOBC-0503-10-50-1999). Allotype: adult female (IOBC-0503 A-10-50-1999). Paratypes: five adult males and five adult females (IOBC-0503 B-10-50-1999).

Dharamtar: (18°42.00′N, 73°01.80′E); October to November 1984, 34 adult males, 46 adult females, 12 immature males, 24 immature females, and eight juveniles. Thane: (19°11.20′N, 72°59.20′E); March 1990, four adult males, one adult female, and two immature females. Bassein: (19°18.80′–19°19.20′N, 72°44.70′–72°51.20′E); April 1989, January 1990. Large number of males and females of all stages. Daman: (20°24.70′N, 72°50.11′E); February 1990, 32 adult males, seven immature males, 46 adult females, and four immature females.

**Description**

Body robust and strongly built. Carapace with dorso-median nodules; anterior margin lacking rostrum, postorbital spines prominent, keels prominent, cheeks sinuous. Eyes stout, extending to distal end of first segment of antennule, cornea occupying little more than half of eye and wider than stalk (Figures 1, 2).

Antennule more robust in male, first segment longer than rest of peduncle, outer distal angle drawn out and armed with few stout plumose setae, outer margin armed with row of 10 long curved plumose setae, inner margin with five to six short slender plumose setae; second segment short and armed with two long and three short hooked setae on inner distal angle, four setae on outer distal angle and three setae on dorsal margin; third segment broader and armed with one spinous seta on outer margin, and four hooked setae and group of seven long plumose setae on inner distal margin; mid-dorsal lobe between flagella present, base of outer flagellum swollen and thickly hirsute (Figure 3). In female antennular peduncle longer, first segment with row of 13 long curved plumose setae along outer margin; second segment with setae on outer and inner distal angles and on mid-dorsal margin; third segment with group of long plumose setae extending from inner distal angle to inner middle margin, hooked setae absent (Figure 4). Antennal scale slightly over-reaching antennular peduncle, nearly five times as long as broad, outer margin straight and terminating in strong spine extending beyond rounded apex; antennal peduncle short, less than half of scale; inner distal angle of sympod armed with two long and two short spines, second spine longest (Figure 5). In young and immature specimens one or two secondary spinules present on second longest spine.

Labrum wider than long with transverse anterior margin and without any process in front (Figure 6). Mandibular palp slender, second segment four times as long as third and with row of barbed setae; third segment armed with group of modified setae on distal border.
Figures 1–10. Rhopalophthalmus mumbayensis sp. nov. (male, unless indicated). (1) Anterior part of body. (2) Carapace, lateral view. (3) Antennule. (4) Antennule of female. (5) Antenna. (6) Labrum. (7, 8) Mandible. (9) Maxillule. (10) Maxilla.
Figures 11–19. *Rhopalophthalmus mumbayensis* sp. nov. (male, unless indicated). (11) First thoracic endopod. (12) Second thoracic endopod. (13) Third thoracic endopod. (14) Same, tip of endopod. (15) Fifth thoracic endopod. (16) Seventh thoracic endopod. (17) Same, one propodal segment. (18) Eighth thoracic limb. (19) Eighth thoracic limb of female.
(Figures 7, 8). Inner lobe of maxillule with five plumose setae and three stout barbed spines, outer lobe with nine strong spines on distal border (Figure 9). Maxilla with large basal lobe and deeply cleft distal lobe; exopod relatively small (Figure 10).

Figures 20–27. *Rhopalophthalmus mumbayensis* sp. nov. (male, unless indicated). (20) First pleopod. (21) Second pleopod. (22) Third pleopod. (23) First pleopod of female. (24) Fifth pleopod of female. (25) Posterior part of body. (26) Telson. (27) Apical spines of telson.
Basis of first thoracic endopod with prominent lobe, claw present (Figure 11) second; thoracic endopod stout, dactylus armed with strong peculiarly barbed spiniform setae (Figure 12). Endopods of third to seventh thoracic limbs slender, becoming longer in posterior pairs; third and fourth endopods with three to four, fifth endopod with four to five, and sixth and seventh endopods with five to six propodal segments (Figures 13–16). All endopods profusely setose, setae on seventh endopod spinulose (Figure 17); outer distal corner of basal plate of exopod rounded, flagelliform part 11–14-segmented. Endopod of eighth limb three-segmented, second segment short with five long plumose setae on inner margin, third segment long and bent, shorter than basal segment of exopod lacking setae (Figure 18). In female, endopod unsegmented, tapering, shorter than basal plate of exopod and armed with short simple seta on inner margin (Figure 19).

In male first abdominal segment with semicircular pleural plates. Pleopods biramous; first pleopod with 11-segmented exopod, and unsegmented endopod (Figure 20); second pleopod with 11-segmented endopod and 15-segmented exopod, first 10 segments with usual pair of plumose setae, distal five segments without setae, terminal segment longest and armed with three long barbed setae (Figure 21). Third and fourth pleopods with 11-segmented and fifth with 10-segmented rami (Figure 22).

In female, pleopods simple, rod-like, becoming longer towards posterior and with row of plumose setae (Figures 23, 24).

Telson broad, 1.3 times longer than last abdominal segment, 2.3 times as long as basal width, abruptly constricted near base to form waist, slightly broadening towards middle and gradually narrowing towards broadly rounded apex; lateral margins armed along distal half with 11–12 stout spines in male, gradually increasing in length towards posterior, apex with two pairs of long stout spines, outer pair slightly longer than inner pair and nearly one-quarter length of telson, each spine with row of bilaterally arranged subsidiary teeth progressively more flattened towards tip of spine (Figures 26, 27). In female, lateral margin of telson armed with 12–14 pairs of spines.

Uropods longer than telson, two-segmented and setose all round; endopod with stout spine near middle on inner margin; exopod longer than endopod (Figure 25).

Length: adult male 8.3–11 mm, adult female 9–12 mm.

Etymology

This species was collected from areas around Mumbai and hence the species name mumbayensis.

Remarks

*Rhopalophthalmus mumbayensis* sp. nov. is related to *R. kempi* O. Tattersall, 1951, *R. orientalis* O. Tattersall, 1957, *R. tattersallae* Pillai, 1961, *R. macropsis* Pillai, 1964, and *R. longipes* Ii, 1964 in having two long and two short spines on the antennal sympod, but they differ from the new species in the following points. In *R. kempi*, there are only three carpopropodal segments in the third to seventh thoracic endopods, and the vestigial endopod of the eighth thoracic limb of both sexes is longer than the basal plate of the exopod. In *R. tattersallae*, one of the long spines on the antennal sympod is barbed; thoracic endopods three to seven have only four carpopropodal segments and the inner pair of apical spines of the telson are longer than the outer pair. In *R. macropsis* and *R. longipes*, the carpopropodus is four-segmented and the telson is long and narrow. In *R. orientalis* there
are four carpopropodal segments, and the telson has 15–16 lateral spines and the apical pairs of the telson spines are equal in length. The combination of characters afforded by the spines on the antennal sympod, the carpopropodal segments of the thoracic endopods, and the armature of the telson will serve to identify this species.

**Ecological note**

At Bassein, this species occurred in large numbers during April. Ninety-five per cent of the samples were constituted by adult males and females, and 80% of the females were carrying 6–20 eggs or larvae in the brood pouch. It occurred at 5–10 m depth, where the bottom sediment was sandy or silty clay. The temperature and salinity recorded ranged from 21 to 33°C and from 29.4 to 38.0 psu, respectively. Its occurrence at 5–10 m depth proves it is a littoral species, and the large number of specimens in the samples indicate that this species is a gregarious form.

*Rhopalophthalmus anishi* sp. nov.

(Figures 28–40)

**Material**

Holotype: adult male (IOBC-0504-10-50-1999). Allotype: adult female (IOBC-0504 A-10-50-1999). Paratypes: two adult males and two adult females (IOBC-0504 B-10-50-1999).

Kashelli: (19°14.30’N, 73°00.20’E), December 1996, 13 adult males, 13 adult females, eight immature males, seven immature females, and 33 juveniles.

**Description**

General form slender. Carapace broadly rounded in front, covering basal part of antennules, post-orbital spines small, continuing backward into faint keels; antero-lateral angles produced into strong spines; cheeks sinuous. Eyes stout, reaching beyond first antennular segment; cornea as broad as stalk and occupying distal third of eye (Figure 28).

Basal segment of antennule in male as long as rest of peduncle, third segment short and stout, but short basal part of outer flagellum swollen and hirsute (Figure 29). In female, basal segment much longer than rest of peduncle. Antennal scale long and narrow reaching clearly beyond antennular peduncle, five times as long as broad; antennal peduncle short, less than half length of scale; sympod with two long and two short spines (Figure 30).

Mouthparts and first and second thoracic endopods as in *R. mumbayensis* sp. nov.

Thoracic endopods three to seven with three to five carpopropodal segments (Figures 31–33). Vestigial endopod of male eighth thoracic limb straight, three-segmented, almost as long as basal segment of exopod, second segment with three to four plumose setae on outer distal corner, apex broadly rounded (Figure 34). In female, eighth endopod longer than basal segment of exopod, slender, straight and unsegmented, distal end produced at apex into minute cusp with short seta (Figure 35).

Pleopods in male biramous, first pleopod with unsegmented endopod and 10-segmented exopod (Figure 36); second pleopod with 10-segmented endopod and 12-segmented exopod, distal segment of exopod with third long barbed setae (Figure 37); third, fourth, and fifth pleopods similar with 10-segmented exopod and endopod (Figure 38).
Figures 28–35. *Rhopalophthalmus anishi* sp. nov. (male, unless indicated). (28) Anterior part of body. (29) Antennule. (30) Antenna. (31) Third thoracic endopod. (32) Fifth thoracic limb. (33) Seventh thoracic endopod. (34) Eighth thoracic limb. (35) Eighth thoracic limb of female.
Figures 36–40. *Rhopalophthalmus anishi* sp. nov. (male). (36) First pleopod. (37) Second pleopod. (38) Third pleopod. (39) Telson. (40) Posterior part of body.
Telson moderately broad, longer than last abdominal segment, about twice as long as broad at base, distal half armed with 11 pairs of graduated spines, spines on distal border long and sharply pointed, outer pair distinctly longer than inner pair, subsidiary teeth sharp (Figure 39).

Uropods longer than telson, two-segmented, endopod with single stout spine on middle inner margin; exopod longer than endopod (Figure 40).

Length: adult male 9.7–11 mm; adult female 9.6–11.7 mm.

**Etymology**

This species is named after the first author’s son, Anish.

**Remarks**

This species can be readily distinguished by the combinations of the following characters: (1) thoracic endopods have three to five carpopropodal segments; (2) vestigial endopod of eighth thoracic limb is longer than the basal segment of the exopod in female and in male almost as long as the basal segment of exopod and (3) spines on the distal border of the telson are sharply pointed and the outer pair of spines are distinctly longer than the inner pair.

*Rhopalophthalmus kempi* O. Tattersall, 1957 is the only other species of the genus in which the endopod of the eighth thoracic limb in both sexes is longer than the basal segment of the exopod. But *R. kempi* differs from the new species in having a shorter antennal scale, only three carpopropodal segments and the inner pair of distal spines on the telson are longer than the outer pair.

**Ecological note**

The new species is a shallow-water form and the temperature and salinity recorded at the time of collection were 25.4°C and 16.4 psu, respectively.

*Rhopalophthalmus murudana* sp. nov.

(Figures 41–52)

**Material**

Holotype: adult male (IOBC-0505-10-50-1999). Allotype: adult female (IOBC-0505 A-10-50-1999).

Murud: (18°16.39′–18°18.30′N, 72°55.28′–72°59.72′E); March 1990, six adult males, eight adult females, 13 immature males, six immature females, and nine juveniles.

**Description**

General form robust. Carapace anteriorly produced into broad triangular rostrum covering basal part of eye stalks; dorsal median nodules present. Eyes stout, as long as first antennular segment, cornea wider than stalk (Figure 41). First segment of male antennule little longer than rest of peduncle, base of outer flagellum swollen and hirsute and all segments furnished with long plumose setae (Figure 42). In female, peduncle longer and
Figures 41–47. *Rhopalophthalmus murudana* sp. nov. (male, unless indicated). (41) Anterior part of body. (42) Antennule. (43) Antenna. (44) Third thoracic endopod. (45) Seventh thoracic endopod, distal part. (46) Eighth thoracic limb. (47) Eighth thoracic limb of female.
more slender than male, first segment 1.5 times longer than rest of peduncle. Antennal scale as long as antennular peduncle, five times as long as broad; antennal peduncle one-third length of scale; antennal sympod with two long and two short spines (Figure 43).

Mouthparts and first and second thoracic endopods as in *R. mumbayensis*. Third to seventh endopods slender, third with two, and fourth to seventh with three propodal segments (Figures 44, 45). Eighth endopod three-segmented; second segment short with

Figures 48–52. *Rhopalophthalmus murudana* sp. nov. (male). (48) First pleopod. (49) Second pleopod. (50) Third pleopod. (51) Telson. (52) Posterior part of body.
five long plumose setae on outer distal margin; third segment cylindrical and bent at right angle, with one stout seta at tip and two on inner margin, when straightened shorter than basal segment of exopod (Figure 46). Eighth endopod in female unsegmented, straight, shorter than basal segment of exopod (Figure 47).

Pleopods in male biramous, first pleopod with unsegmented endopod and 10-segmented exopod (Figure 48). Endopod of second pleopod 11-segmented; exopod long and 12-segmented, segments becoming longer posteriorly, distal segment with three long barbed setae (Figure 49). Pleopods three to five with 10-segmented exopod and endopod (Figure 50). In female, pleopods simple, unsegmented and rod-shaped becoming longer in posterior pairs.

Telson 1.5 times longer than last abdominal somite, 2.7 times as long as broad at base, more than distal half of lateral margin armed with 15–16 slender spines gradually increasing in length distally, first two spines very small; inner pair of distal spines slightly longer than outer pair, subsidiary teeth becoming flattened distally (Figure 51).

Uropods longer than telson, two-segmented, endopod with stout spine on inner margin, exopod longer than endopod (Figure 52).

Length: adult male and female 8.5–9.3 mm.

Etymology
This species is named after the type locality.

Remarks
This species closely resembles *R. orientalis*, O. Tattersall. The vestigial endopod of the eighth thoracic limb, the number of carpopropodal segments of third to seventh thoracic endopods, and the spines on the telson are very similar in the two species. But in *R. orientalis* the rostrum is relatively low, eyes are longer, and the subsidiary teeth on the telson are broader and truncate. This species also resembles *R. mumbayensis* sp. nov. but differs in having fewer carpopropodal segments, spines on the lateral border of the telson are more slender and more in number, and the inner pair of distal spines on the telson are longer than the outer pair.

Ecological note
This species occurred in temperatures and salinity of 25.2–28.5°C and 35.7–36.3 psu, respectively, and was collected from 5 to 9 m depth where the bottom was clayey silt.

*Rhopalophthalmus vijayai* sp. nov.  
(Figures 53–64)

Material
Holotype: adult male (IOBC-0506-10-50-1999). Allotype: adult female (IOBC-0506 A-10-50-1999).

Dahej: (21°40.00′–21°43.30′N, 72°29.45′–72°32.00′E); November 1996, nine adult males, 30 adult females, three immature males, nine immature females, and 478 juveniles.
Figures 53–59. *Rhopalophthalmus vijayai* sp. nov. (male, unless indicated). (53) Anterior part of body. (54) Antennule. (55) Antenna. (56) Third thoracic endopod. (57) Fifth thoracic limb. (58) Eighth thoracic limb. (59) Eighth thoracic limb of female.
Description

General form slender. Carapace short, leaving last three thoracic somites exposed; anteriorly produced into broadly rounded rostrum covering basal one-quarter of antennular peduncle and basal part of eyestalks; two small dorso-median nodules present, postorbital spines small, cheeks sinuous. Eyes extending to distal end of first antennular segment, cornea occupying one-quarter of eye and little narrower than stalk (Figure 53).

Antennule robust in male, first segment as long as distal two segments combined and with row of 9–10 plumose setae on outer margin, outer distal corner produced and tipped with few setae; second segment short with two hooked setae on inner margin, outer distal corner produced and tipped with setae; third segment broad with one spinous seta on outer...
margin, four hooked setae on inner margin and five to six long plumose setae on inner distal angle; dorsal lobe tipped with few setae; base of outer flagellum swollen and densely hirsute (Figure 54). In female antennular peduncle slender and longer, first segment longer than other two segments combined, hooked setae absent; third segment with seven long plumose setae on inner distal angle and four setae on inner margin. Antennal scale as long as antennular peduncle, 4.6 times as long as broad, outer margin straight, terminating in spine projecting beyond rounded apex, inner margin setose; antennal peduncle extending to middle of scale; antennal sympod with two long and two short spines on inner distal corner (Figure 55).

Mouthparts and first and second thoracic endopods as in *R. mumbayensis*.

Endopods of third to seventh thoracic limbs slender, increasing in length posteriorly; propodus three-segmented in third and five-segmented in fourth to seventh endopods (Figures 56, 57). Eighth endopod in male three-segmented, shorter than proximal segment of exopod, second segment short with three long plumose setae on outer distal corner, second segment long and finger-like with single simple seta at tip (Figure 58). In female eighth endopod unsegmented with two simple setae and shorter than proximal segment (Figure 59).

Pleopods biramous and natatory. First pleopod with 10-segmented exopod; endopod unsegmented and short, sympod with three plumose setae on inner distal margin and row of long plumose setae along mid-dorsal line (Figure 60). Second pleopod with 10-segmented endopod; exopod 13-segmented, segments increasing in length posteriorly, first five segments with usual pair of plumose setae, distal eight segments without setae, terminal segment ending in three long barbed setae, two at tip, one slightly away from tip (Figure 61). Third to fifth pleopods in male similar, endopod and exopod 10-segmented. Pleopods in female simple, unsegmented and rod-shaped, distal pairs progressively increasing in length (Figure 62).

Telson 1.4 times longer than last abdominal somite, 2.3 times as long as maximum width at base, abruptly narrowing near base to form waist, lateral margins almost parallel up to distal half and gradually narrowing towards rounded apex and armed along distal half with seven slender subequal spines, distal margin with two pairs of long sub-equal spines, inner pair of spines with 12 and outer pair with 10 pairs of closely set subsidiary teeth, proximal teeth spiniform and distal teeth broader (Figure 63).

Uropods: exopod and endopod two-segmented, setose all round and longer than telson. Endopod with one strong spine on inner margin (Figure 64).

Length: adult male 6.6 mm, adult female 8.6 mm.

**Etymology**

This species is named in honour of Dr Vijayalakshmi R. Nair, Scientist (retired), NIO.

**Remarks**

This species can be easily distinguished from all the other species of the genus except *R. africana* O. Tattersall, 1957 by its slender form and in having fewer spines on the lateral border of the telson. In *R. africana*, the lateral margin of the telson is armed with six to eight spines only, but differs from the new species in having only two large spines on the antennal sympod, four carpopropodal segments in third to seventh thoracic endopods and in its
more robust form. The largest male and female of *R. africana* measured is 10 and 10.2 mm, respectively, whereas the maximum size of the present species is only 8.6 mm.

**Ecological note**

The specimens were collected from depths between 8 and 25 m, where the bottom was silty sand, and occurred in temperatures and salinity ranging from 26.9 to 29.0°C and from 23.1 to 29.8 psu, respectively.

**Acknowledgements**

The authors are grateful to the Director, National Institute of Oceanography, Goa and to the Scientist-in-Charge, Regional Centre, NIO, Kochi for the encouragement and facilities provided. Thanks are due to the Scientist-in-Charge, NIO, Mumbai, for providing the study material. This is NIO contribution no. 4149.

**References**

Ii N. 1964. Fauna Japonica Mysidae. Tokyo: Biogeographical Society of Japan, 610 p.

Illeg G. 1906. Bericht über die neuen Schizopoden-gattungen und-arten der Deutschen Tiefsee-Expedition 1898–1899. I, Mysidaceen. Zoologischer Anzeiger 30:194–211.

Pillai NK. 1961. Additions to the Mysidacea of Kerala. Bulletin of the Central Research Institute, University of Kerala 8:15–35.

Pillai NK. 1964. Report on the Mysidacea in the collection of the Central Marine Fisheries Research Institute, Mandapam Camp, South India. Journal of the Marine Biological Association of India 6:1–41.

Pillai NK. 1973. Handbook to the International Zooplankton Collections. Indian Ocean Biological Centre, National Institute of Oceanography, Kochi 4:1–125.

Tattersall OS. 1957. Report on a small collection of Mysidacea from the Sierra Leone estuary together with a survey of the genus *Rhopalophthalmus* Illig and a description of a new species of *Tenagomysis* from Lagos, Nigeria. Proceedings of the Zoological Society of London 129:81–128.

Tranter DJ, Devi CBL, Balakrishnan KP. 1972. Heron Tranter Net, handbook to the international zooplankton collections. Proceedings of the Workshop on Plankton Methods 3:6–7.