

Description of a new species of *Petalopthalmus* (Mysidacea) with a revised definition of the genus

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Abstract. A new species of *Petalopthalmus*, *P. australis* is described. This species can be easily distinguished from its congeners by the broad antennal scale whose outer margin is straight and naked. A key for the identification of *Petalopthalmus* spp. is also included.

Introduction

Two species of the genus have hitherto been recorded in the Indian Ocean; from the Laccadive Sea (Alcock and Anderson, 1894), Gulf of Aden (Illig, 1930; Tattersall, 1939; Pillai, 1968), Southern Arabian Sea (Tattersall, 1939) and off Seychelles Islands (Tattersall, 1955) all confined to the western part. The present record is from the west coast of Australia between 30°16'S, 114°51'E and 35°10'S, 118°35'E and therefore extends the distribution of the genus considerably. The samples were caught in the surface and subsurface hauls of the plankton net during night in April 1976. This species shows sufficiently peculiar characteristics that substantial modification of the definition of the genus given by Tattersall (1968) has become necessary. A detailed description of the species and a revised definition of the genus is given below. The plankton samples from which these species were picked up were received at the R.C. of N.I.O., Cochin from CSIRO, Australia.

Genus *Petalopthalmus* W.Suhm

Petalopthalmus Willemoes-Suhm, R. 1875, p. 23; Tattersall and Tattersall, 1951, p. 120; Tattersall, 1968, p. 283.

Definition

Body elongated. Carapace short and membraneous leaving the last two to three thoracic somites uncovered dorsally, rostrum short and very small flanked by a pair of small tooth-like processes, anterior margin of carapace more or less concave. Antennular peduncle very long with sexual dimorphism. Antennal scale narrowly lanceolate, setose all round or broad with outer margin straight and naked (*australis*); eyes with or without functional visual elements, with or without papilla. Mandibles with *lacinia mobilis* reduced, spine row absent, palp enormous, long and prehensile. Basal lobe of maxilla small without setiferous expansion, distal lobe small or expanded (*australis*). First thoracic appendage robust, lacking exopod, large delicate epipod present. Second thoracic endopod similar to first without exopod, large quadrangular lobe borne on the ischium. Thoracic

appendage three to eight slender with long delicate nail. Pleopods of male biramous and natatory; of female uniramous or biramous and non-natatory (*caribbeanus* and *australis*). Uropods, exopod two segmented, with proximal outer border naked ending in 1–3 spines, endopod without spines. Telson large, quadrangular, apex truncate or slightly emarginate, not cleft, lateral margins spiny.

At present the genus includes only four species and can be identified by the following key:-

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| 1a. | Antennal scale narrow, lanceolate and setose all round. | 2. |
| 1b. | Antennal scale broad and the apex produced into a lobe, outer margin straight and naked. | <i>P. australis</i> . |
| 2a. | Eyes with functional visual elements, apex of telson with plumose setae. | 3. |
| 2b. | Eyes without functional visual elements, apex of telson without plumose setae. | <i>P. armiger</i> . |
| 3a. | Eyes with ocular papilla, pleopods of female uniramous, lateral margin of telson armed with 17–18 spines arranged in series. | <i>P. oculatus</i> . |
| 3b. | Eyes without ocular papilla, pleopods of female biramous, lateral margin of telson with 12–15 spines increasing in length backwards. | <i>P. caribbeanus</i> . |

Petalophthalmus australis sp.nov.

Material

42 males and 113 females. All the types are deposited in the Reference Collections of the Indian Ocean Biological Centre with the following catalogue numbers: Holotype ♂ IOBC - 0383-10-50-1981, Allotype ♀ IOBC -0383A-10-50-1981, Paratypes 5♂:5♀ IOBC - 0383B-10-50-1981.

Description

Body long and slender. Carapace short, leaving the last three thoracic somites fully exposed, anteriorly produced into a short blunt rostrum, anterolateral corners rounded, a small toothlike process present on either side of the rostrum (Figures 1 and 2).

Eyes well developed and elongated, cornea clearly broader than stalk, stalk with a minute tubercle near the middle of its anterior border.

Antennular peduncle (Figure 3) long, first segment longer than second and third together, and carries a few setae at the outer distal angle and a strong spine in the middle of its dorso-distal end; second segment only half the length of first, with a row of setae at the distal end; third segment very short, a dorsal setose lobe

present between the flagella. The inner borders of second and third segments with a row of plumose setae. Peduncle of male short but stout, outer flagellum proximally enlarged. In the female (Figure 4) peduncle slender and long, inner flagellum thicker than outer.

Antennal scale (Figure 5) broad, reaching the distal end of the second antennular segment, outer margin straight and naked, apex produced into a lobe, near-

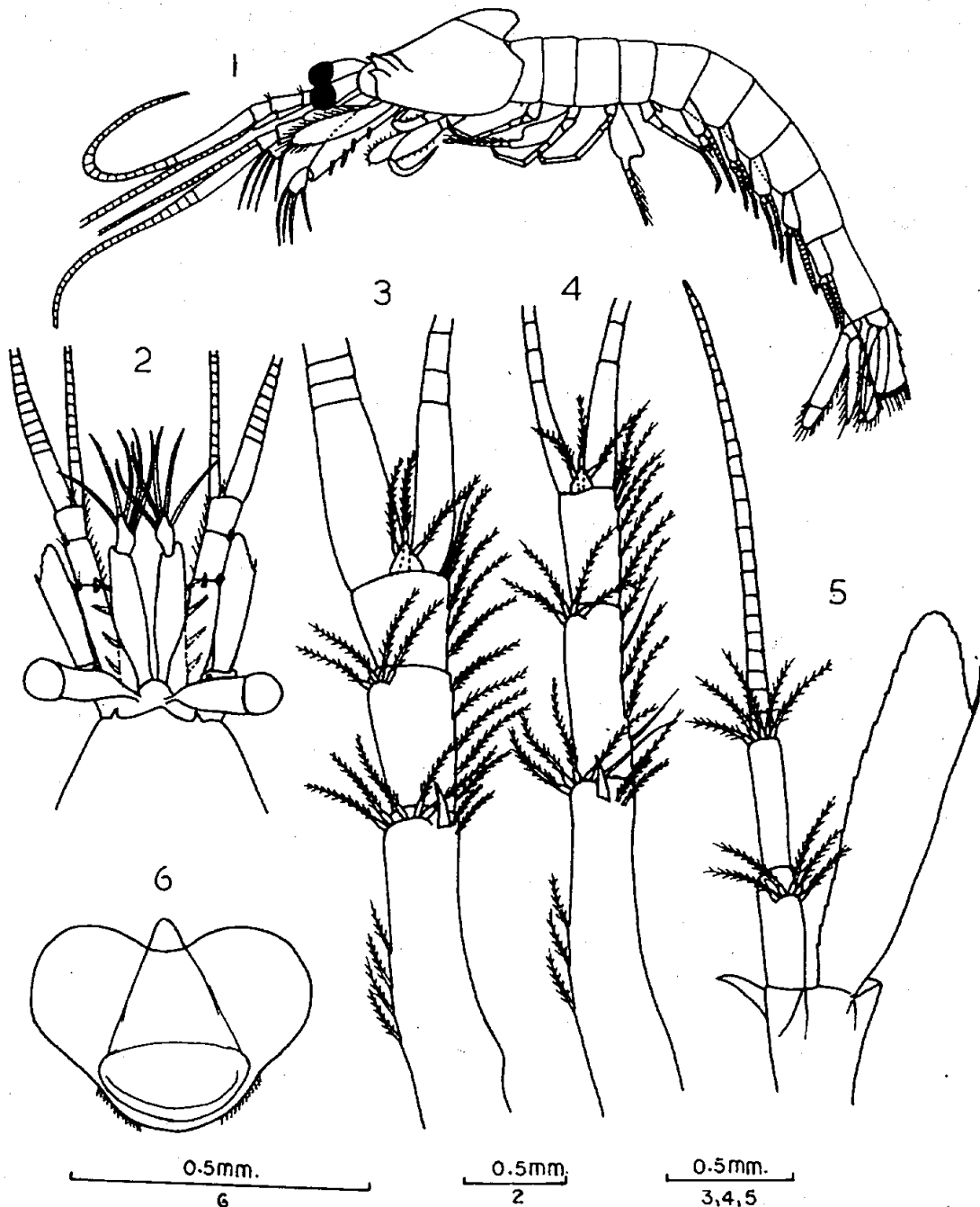


Fig. 1. *P. australis* sp. nov. Adult male, lateral view.
 Fig. 2. *P. australis* sp. nov. Anterior part of body, dorsal view.
 Fig. 3. *P. australis* sp. nov. Antennule.
 Fig. 4. *P. australis* sp. nov. Antennule of the female.
 Fig. 5. *P. australis* sp. nov. Antenna.
 Fig. 6. *P. australis* sp. nov. Labrum.

ly 1/3 of the total length of the scale, apex and inner margin setose, with a spine on the outer distal angle; peduncle three-segmented, first segment very short, third longer than second, second and third segments with a distal group of setae, flagellum long and multisegmented; antennal sympod produced into an acute process on the inner side.

Labrum (Figure 6) symmetrical, anterior border emarginate in the middle with a rounded projection, posterior border furnished with fine short hairs.

Cutting edge of mandibles (Figure 8) strongly chitinized, incisor processes broad. Mandibular palp (Figure 7) long and three segmented, first segment short, second very long reaching the middle of the second antennular segment, inner margin armed with 3–4 short spines, terminal segment 1/4 the length of the preceding segment, with a flexure between the two and armed with strong spines, three on the apex and three along the lower margin. The spines are grooved on the inner side. The inner margin carries a long slender simple spine.

Maxillule (Figure 9) very small, inner lobe with three small setae, outer lobe distally armed with eight strong barbed spines arranged in two rows.

Maxilla (Figure 10) with somewhat elongated exopod with long setae. Endopod long, inner border armed with long plumose setae, basal lobe of maxilla very small, distal lobe very much enlarged with short pectinate setae.

First thoracic limb (Figure 11) short and robust, ischium produced on the inner side into a small triangular lobe, tipped with a long straight spine, carpopropodus highly enlarged, dactylus small with a long curved nail. All the segments with spine-like setae. Exopod absent, endopod with epipod long and delicate.

Second thoracic limb (Figure 12) massive and most conspicuous in both sexes, both exopod and epipod absent. Lobe of ischium long and quadrangular, reaching beyond merus, its border carrying ~30 spines arranged in series; merus long and broad with two spines, carpopropodus much enlarged and elliptic, carrying several spines, dactylus fused with nail to form a long curved claw.

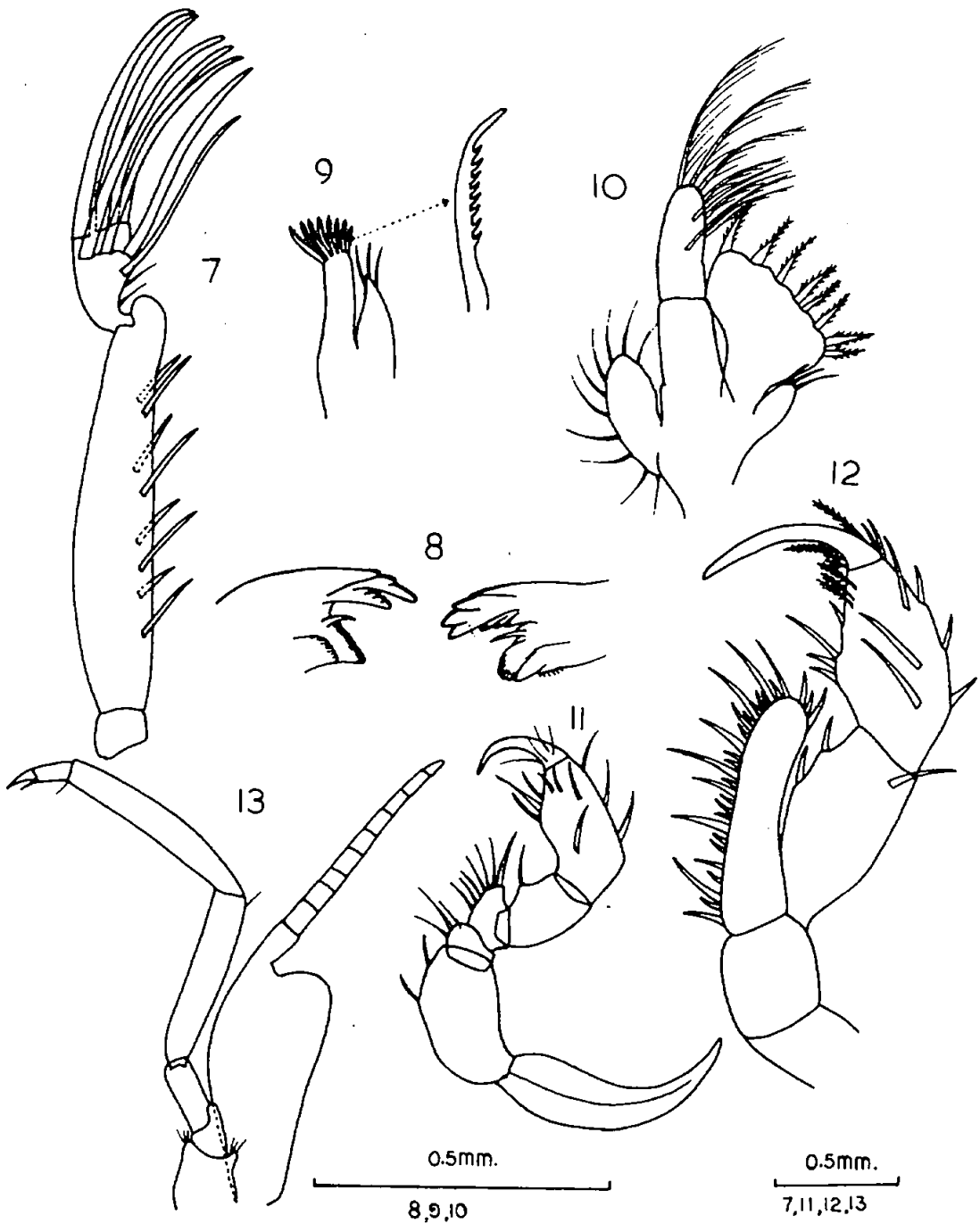
Thoracic endopods three to eight (Figures 13 and 14) long and slender, propodus undivided, sixth segment longer than fifth, dactylus small carrying a slender nail, all segments devoid of armature. Basal segment of exopod flattened, flagellar portion ten-jointed. In the male the eighth segment carries a pair of small genital appendices.

Male pleopods biramous, sympod greatly enlarged and thickened. First pleopod (Figure 18) with one jointed endopod and thirteen segmented exopod; remaining pleopods (Figure 19) with eleven segmented endopod and thirteen segmented exopod without modifications. All the exopods flagella like; basal joint of endopod as in female pleopod, remaining joints form a flagellum.

Female pleopods biramous and successively increasing in length, sympod narrow and elongated. First pleopod (Figure 15) with single-segmented endopod and five segmented exopod; remaining pleopods (Figures 16 and 17) with two segmented endopod and five-segmented exopod. Exopod longer than endopod and not flagella-like, segments long and slender, endopod with long setae with swollen bases.

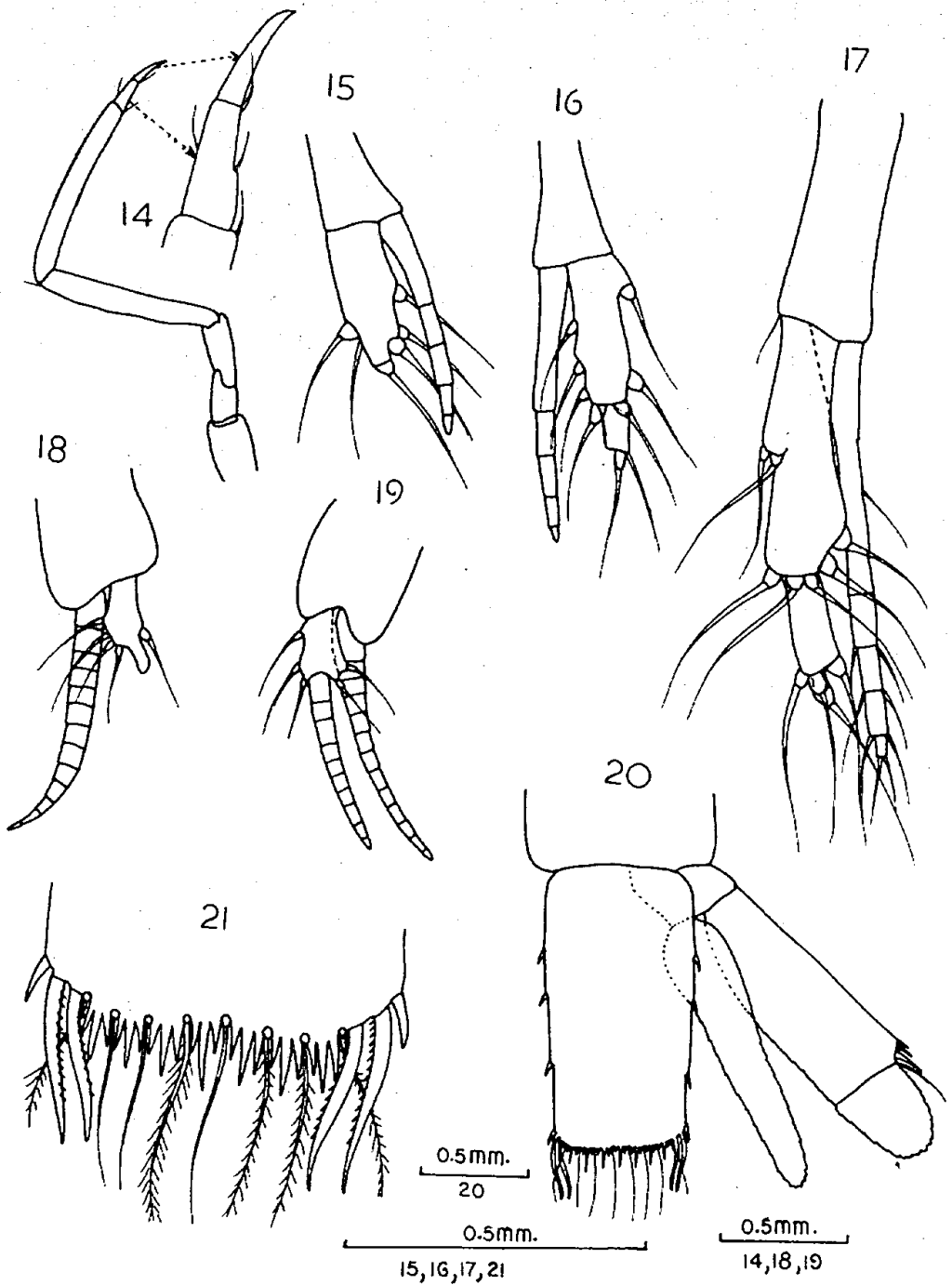
Telson (Figure 20) quadrangular, twice as long as broad, lateral margins parallel with four short well-spaced spines. Apex (Figure 21) truncate, carrying

A new species of *Petalophthalmus*



- Fig. 7. *P. australis* sp.nov. Mandibular palp.
 Fig. 8. *P. australis* sp.nov. Mandibles.
 Fig. 9. *P. australis* sp.nov. Maxillule.
 Fig. 10. *P. australis* sp.nov. Maxilla.
 Fig. 11. *P. australis* sp.nov. First thoracic limb.
 Fig. 12. *P. australis* sp.nov. Second thoracic limb.
 Fig. 13. *P. australis* sp.nov. Third thoracic limb.

twenty-five spines, the two outer pairs long and subequal and barbed on the inner side; remaining spines arranged in definite series with eight long plumose setae between them. Telson shorter than the sixth abdominal segment.



- Fig. 14. *P. australis* sp.nov. Eighth thoracic endopod.
 Fig. 15. *P. australis* sp.nov. First pleopod of the female.
 Fig. 16. *P. australis* sp.nov. Second pleopod of the female.
 Fig. 17. *P. australis* sp.nov. Fifth pleopod of the female.
 Fig. 18. *P. australis* sp.nov. First pleopod of the male.
 Fig. 19. *P. australis* sp.nov. Fifth pleopod of the male.
 Fig. 20. *P. australis* sp.nov. Posterior part of body, dorsal view.
 Fig. 21. *P. australis* sp.nov. Tip of telson.

Endopod of uropod (Figure 20) over reaching telson and setose all round. Exopod broader and longer than endopod, two-segmented, distal segment occupying 1/4 of exopod, outer margin of basal segment distally armed with three spines followed by a seta. Adult male and female up to 9.5 mm.

Discussion

Genus *Petalophthalmus* includes three species, *P. armiger* W.Suhm (1875), *P. oculatus* Illig (1906) and *P. caribbeanus* Tattersall (1968). In the biramous nature of the female pleopods, *P. australis* sp.nov. shows the closest affinity to *P. caribbeanus*, a characteristic which has not so far been reported in the other known species belonging not only to the genus but to the family. Nevertheless it differs from the latter and the other two species in several important characters. The most remarkable characteristic in the present species is the antennal scale. In *P. australis* the antennal scale is broad, outer margin is straight and naked and the apex is produced into a distinct lobe with a spine on the outer distal angle. In the other three species the scale is narrow, lanceolate, and setose all round.

The terminal segment of the mandibular palp is only 1/4 of the length of the preceding segment and carries seven spines whereas in the other species it is longer, more than half the length of the preceding segment and carries nine spines.

The lobe from the third segment of maxilla is considerably expanded while the other species lack such a setiferous expansion.

Another prominent characteristic observed is that the lateral margin of telson carries only 4 spines which are short and well-spaced, against 40–50 in *P. armiger*, 17–18 in *P. oculatus* and 12–15 in *P. caribbeanus*. In *P. australis* the apex of the telson is truncate and the spines are arranged in definite series. In the other species the apex of the telson has a small but distinct emargination and the apical spines do not have a serial arrangement. The armature of the telson is therefore totally different and easily distinguish *P. australis*.

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References

- Alcock, A. and Anderson, A.R.S.: 1894, 'An account of a recent collection of deep sea Crustacea from the Bay of Bengal and Laccadive Sea, *J. Asiat. Soc. Bengal*, 63, 141-185.
Illig, G.: 1930, 'Die Schizopodan der deutschen Tiefsee-Expedition', *Valdivia*, 22, 400-625.
Pillai, N.K.: 1968, 'Redescription of *Petalophthalmus oculatus* (Crustacea: Mysidacea) based on an adult female collected from near the type locality', *J. Zool. Lond.*, 155, 283-291.
Tattersall, O.S.: 1955, 'Mysidacea', *Discovery* Rep. 28, 1-190.
Tattersall, O.S.: 1968, 'A new species of *Petalophthalmus* (Mysidacea) based on specimens from off Puerto Rico, hitherto referred to *Petalophthalmus oculatus*', *J. Zool. Lond.*, 155, 271-282.

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- Tattersall, W.M.: 1939, 'The Euphausiacea and Mysidacea of the John Murray Expedition to the Indian Ocean', *Sci. Rep. John Murray Exped.*, **5**, 203-246.
- Tattersall, W.M. and Tattersall, O.S.: 1951, '*The British Mysidacea*', Ray Society London, 1-292.
- Willemoes-Suhm, R. Van: 1875, 'On some Atlantic crustacea from the Challenger expedition', *Trans. Linn. Soc. London, Zool.*, **1**, 23-59.