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A re-evaluation of the systematics of K. H. Barnard's review of anthuridean isopods

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The taxonomic section of K. H. Barnard's 1925 study of the anthuridean isopods, published in the *Journal of the Linnean Society of London*, is re-examined in light of recent advances in the knowledge of the group. The present status of all 67 species mentioned by Barnard is discussed. A few of these have been previously redescribed or reassigned. Several, including *Haliophasma dakarensis*, *Ananthura sulcatacauda*, *Ananthura ovalis*, *Cyathura indica*, *Cyathura crucis*, *Apanthura senegalensis*, *Accalathura crassa*, *Leptanthura orientalis*, *Leptanthura thori*, *Leptanthura truncata*, and *Paranthura porteri* are redescribed and figured as fully as possible, given the limitations of the material. Supplementary figures for some of the other species are provided as an aid to the further definition of these species. In several cases, because of lack of material, the uncertain taxonomic status of a species is indicated. A new genus, *Virganthura* is diagnosed, with *Accalathura crassa* Barnard, 1925, as the type species.

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INTRODUCTION

The isopod suborder Anthuridea has in the last decade received considerable taxonomic attention, with active research being pursued in Europe, Australia, South America, the U.S.A., and Japan. Prior to this period, however, there was a long hiatus in which only occasional short papers on the group appeared. During these "dark ages" K. H. Barnard's 1925 paper was the most comprehensive and significant contribution to anthuridean taxonomy. (This paper also provided some information on morphology, especially of the tailfan and statocysts, which served as a basis for the work of Wägele, 1981a.) Barnard summarized the state of taxonomic

knowledge at the time, and added a considerable number of new taxa, all of which were based on material in the Zoological Museum, University of Copenhagen (ZMUC). Unfortunately, the descriptions of these new taxa were sparse, the illustrations even more so. During the aforementioned renaissance of the last decade, a number of Barnard's species were redescribed and figured. Nevertheless, several still are in need of fuller descriptions.

The present paper aims to fill some of these taxonomic gaps. I have received all the anthuridean material from the Zoological Museum, Copenhagen, and have redescribed and figured this material. The format of the paper follows exactly the order of Barnard's paper. Each speci-

es mentioned by him is mentioned here. Where relevant, reference is made to published redescrptions of some species. The present taxonomic status of the species, where different from the name used by Barnard, is given in parentheses below Barnard's 1925 name. Details of type material are provided, where possible. In a few cases, material from the National Museum of Natural History, Smithsonian Institution (USNM) has been examined to supplement a description or to clarify taxonomic status. Where the status of a species has not been decided or confirmed, usually because the type material is in another collection and has not been reexamined, this is mentioned. The paper thus also serves to highlight some gaps in our knowledge.

Barnard (1925) divided the Anthuridea into two sections, A and B, based on mouthpart structure. These sections have since been recognized as separate families (Menzies and Glynn 1968), and further families have been (Wägele 1981a), or are about to be split off. As the familial composition of the suborder is thus still unsettled, families are not designated in this paper.

SYSTEMATICS

SECTION A

Anthura gracilis (Montague, 1808)

Anthura gracilis: Barnard 1925: 130; Wägele 1980: 53, figs. 1-35.

Remarks

Wägele (1980) has provided a detailed description and figures of the manca and adult stages of this species.

Ptilanthura tenuis Harger, 1878

Ptilanthura tenuis: Barnard 1925: 130.

Diagnosis

Eyes present. Antennular flagellum of 3 articles; antennal flagellum of 4 articles. Mandibular palp of one article; incisor, lamina dentata, and molar present. Maxillipedal palp of single arti-

cle; endite absent. Pereopod 1 subchelate, propodus expanded; pereopods 2 and 3 subchelate but smaller than pereopod 1; pereopods 4-7 with rectangular carpus. Exopod of pleopod 1 operculiform. Pleonites 1-5 fused. Telson with 2 basal statocysts.

Remarks

Three of Harger's syntypes are present in the Smithsonian Institution's collections (USNM 2948, 2949, 35950).

Exanthura macrura Barnard, 1914

(*Haliophasma macrurum* (Barnard, 1914))

Exanthura macrura Barnard, 1914: 337a, pl. 28A; 1925: 131, text-fig. 7.

Haliophasma macrurum (Barnard), Kensley 1982a: 121, figs. 16-18.

Remarks

The species has been redescribed and figured by Kensley (1982a), under the name *Haliophasma macrurum*.

Exanthura filiformis (Lucas, 1849)

(*Haliophasma austroafricana* Kensley, 1982a)

Exanthura filiformis: Barnard 1925: 131, pl. 4, fig. 22.

Haliophasma austroafricana Kensley, 1982a: 118, figs. 13-15

Remarks

Barnard (1925) expressed the view that the Mediterranean and South African species were not conspecific. The South African material was redescribed under the name *Haliophasma austroafricana* Kensley, 1982a. Wägele (1981b) noted that Lucas' description of *Anthura filiformis* is too brief to identify it. The species identified as *Exanthura filiformis* by Larwood (1940), was described as *Alloanthura larwoodi* Wägele, 1981b.

Haliophasma purpurea Haswell, 1881

Haliophasma purpurea: Barnard 1925: 132, pl. 4 fig. 3.

Haliophasma purpureum: Poore 1975: 525, fig. 13.

Remarks

This species was redescribed and figured by Poore (1975) as *Haliophasma purpureum*.

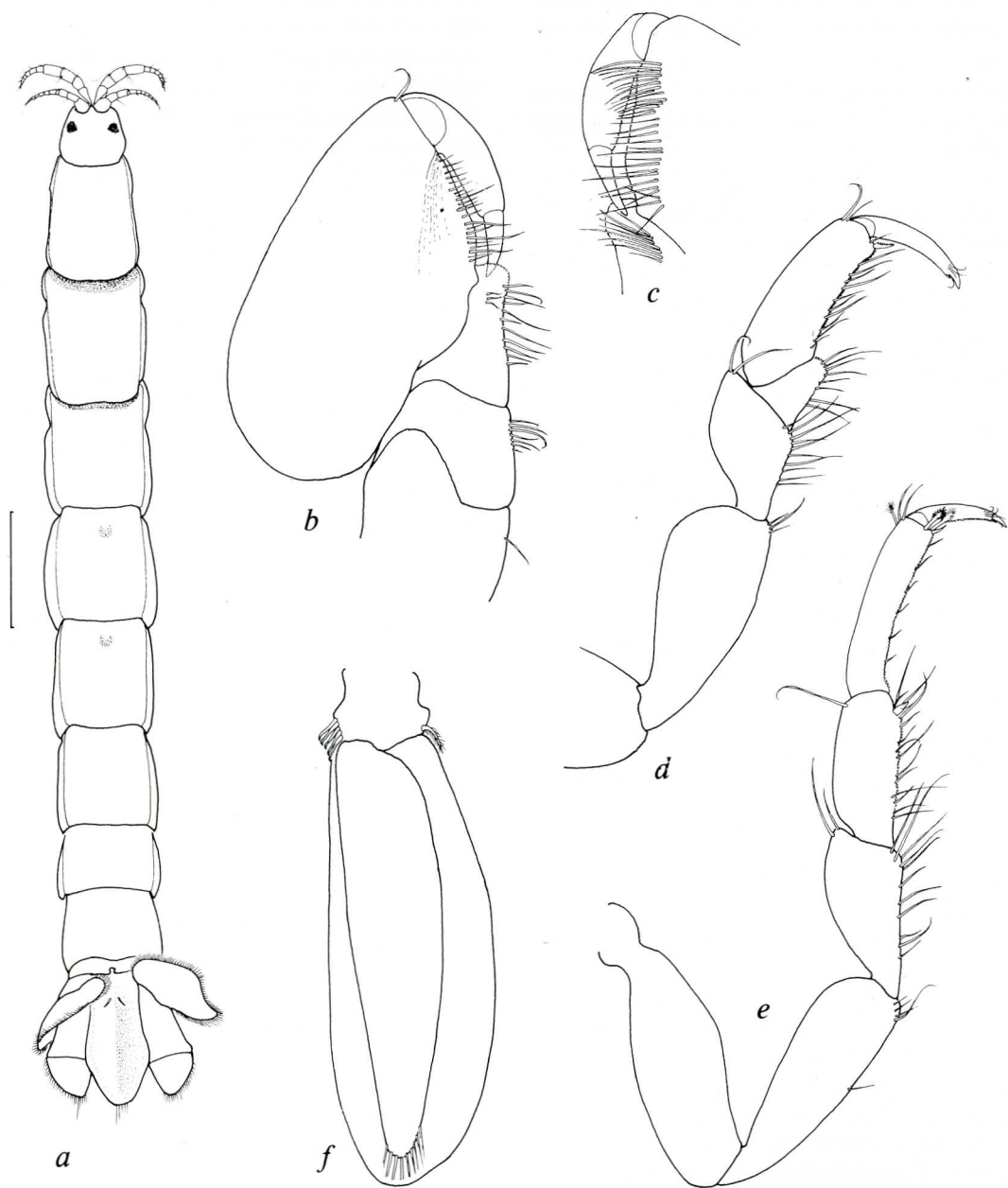


Fig. 1. *Haliophasma dakarensis*, holotype, non-ovig. ♀: a, whole animal in dorsal view; b, pereopod 1, outer view; c, pereopod 1, propodal palm in mesial view; d, pereopod 2; e, pereopod 7; f, pleopod 1. Habitus scale 2 mm.

***Haliophasma tricarinata* Barnard, 1925**

Haliophasma tricarinata Barnard, 1925: 132, pl.4 fig. 2.

Haliophasma tricarinatum: Kensley 1982a: 126, figs. 19-20

Remarks

This species was redescribed and figured under the name *Haliophasma tricarinatum* by Kensley (1982a).

***Haliophasma coronicauda* Barnard, 1925**

(*Malacanthura coronicauda* Barnard, 1925))

Haliophasma coronicauda Barnard, 1925: 132.

Malacanthura coronicauda: Kensley 1982a: 130, figs. 22-23.

Remarks

This species was redescribed and figured under the name *Malacanthura coronicauda* by Kensley (1982a).

***Haliophasma dakarensis* Barnard, 1925**

Fig. 1

Haliophasma dakarensis Barnard, 1925: 113, pl. 4, fig. 4.

Material examined: ZMUC, holotype, non-ovigerous ♀, 17.0 mm, Dakar, Senegal, West Africa, 25-29 m (12-14 fms), February 1906, leg. Brinkmann. (Mouthparts except for maxilla missing.)

Description

Eyes well pigmented. Antennular flagellum of 8 articles; antennal flagellum of 6 articles. Pereopod 1, carpus triangular, distally rounded, bearing setae on posterior margin; propodus inflated, strongly produced proximally, palm very faintly convex, with single row of setae on internal surface, irregular row of more densely set setae on internal surface; unguis about one-half length of remainder of dactyl. Pereopod 2 non-chelate, merus with simple setae on posterior margin; carpus triangular, lacking free anterior margin, posterodistally rounded, with simple setae on posterior margin; propodus roughly rectangular, with setae on posterior margin, single posterodistal serrate spine. Pereopod 7, carpus roughly rectangular, with sensory posterodistal spine; propodus 4.5 times longer than wide, with 2 posterodistal fringed spines. Pereonites 4 and 5 each with faint middorsal pit. Pleopod 1, basis with 5 retinacula; exopod operculiform, about 1.7 times width, and subequal in length to endo-

pod. Uropodal exopod with outer margin sinuate, just reaching to base of endopod; latter triangular, with apex rounded. Telson widest in posterior half, with posterior margin rounded/truncate; with middorsal longitudinal rounded ridge running almost full length; 2 basal statocysts present.

Remarks.

It is unfortunate that mandibles and maxillipeds are missing from the holotype; both these appendages provide useful diagnostic features. Barnard (1925: 133) does note that the maxilliped is "5-jointed". Counting the fused basal article and the first free article, this would imply a palp of three articles, indicating that the species perhaps belongs to the genus *Malacanthura*.

***Malacanthura linguicauda* (Barnard, 1920)**

Anthura linguicauda Barnard, 1920: 338.

Malacanthura linguicauda: Barnard 1925: 133; Kensley 1982a: 137, fig.27.

Remarks

Kensley (1982a) redescribed and figured this, the type species of the genus.

***Eisothistos vermiformis* Haswell, 1884**

Eisothistos vermiformis: Barnard 1925: 134.

Remarks

This, the type species of the genus, has not been redescribed or recorded since Haswell's description. Wägele (1979a), however, did rediagnose the genus.

***Eisothistos atlanticus* Vanhöffen, 1914**

(*Eisothistos petrensis* Kensley, 1984)

Eisothistos atlanticus: Barnard 1925: 134.

Eisothistos petrensis Kensley, 1984: 6, figs. 4-6.

Material examined: ZMUC, 4 non-ovig. ♀, St. James Bay, St. Thomas, U. S. Virgin Island, 5 fms (10 m), 19 December 1905, leg. T. Mortensen

Remarks

Barnard (1925) mentioned that he had not seen the type material of this species, and that his identification, based on West Indian material

only, could prove to be erroneous. In fact, the West Indian species does differ from *E. atlanticus*, as was described by Kensley (1984).

***Eisothistos antarcticus* Vanhöffen, 1914**

Eisothistos antarcticus Vanhöffen, 1914: 494, figs. 32, 33; Tattersall 1921: 232; Barnard 1925: 134; Wägele 1979a: 5; 1984a: 101, figs. 1-6.

Remarks

This species was well redescribed and copiously figured by Wägele (1984)

***Anthelura elongata* Norman and Stebbing, 1886**

Anthelura elongata: Barnard 1925: 135, pl. 4, fig. 8; Kensley 1978a: 787.

Remarks

This is the type species of the genus *Anthelura*, which was rediagnosed by Kensley (1978a).

***Anthelura remipes* Barnard, 1914**

(*Quantanthura remipes* (Barnard, 1914))

Anthelura remipes Barnard, 1914: 338a, pl. 28B; 1925: 135. *Quantanthura remipes*: Kensley 1982a: 166, figs. 45-46.

Remarks

This species was rediagnosed and figured by Kensley (1982).

***Anthelura truncata* (Hansen, 1916)**

(*Malacanthura truncata* (Hansen, 1916))

Anthelura truncata: Barnard 1925: 135; Menzies 1962: 192, fig. 72A.

Malacanthura truncata: Kensley 1982b: 17, figs. 9-11.

Remarks

Kensley (1982b) reassigned this species after examining fresh material from the North Atlantic.

***Ananthura sulcicauda* Barnard, 1914**

(*Anthelura sulcicauda* (Barnard, 1914))

Fig. 2

Ananthura sulcicauda: Barnard 1925: 136, pl. 4 (fig. 9).

Anthelura sulcicauda: Kensley 1978a: 788.

Material examined: ZMUC, syntype, non-ovig. ♀, 5.8 mm, Danish *Ingolf* Expedition sta 78, SW of Iceland, 60° 37'N 27° 52'W, 799 Danish fms (1505 m).

Description

Integument not indurate. Body proportions: $C < 1 < 2 = 3 < 4 = 5 > 6 > 7$. Cephalon with low rostrum reaching as far anteriorly as anterolateral corners; eyes lacking. Pleonites 1-6 short, free; pleonite 6, posterior margin convex, with middorsal notch. Telson elongate-lanceolate, widest just anterior of midlength, then tapering to narrowly rounded apex; anterior half strongly convex dorsally due to capsule-like structure having narrowly elongate slit-like dorsal opening; 2 basal statocysts present.

Antennular flagellum of 6 articles, article 2 longest; 3 distal articles each with single aesthetasc. Antennal flagellum of 5 articles, terminal article minute. Pereopod 1, unguis more than half length of remainder of dactylus; propodus somewhat expanded, palm straight, bearing few simple setae. Pereopods 2 and 3 similar, of similar proportions to pereopod 1; palm bearing stout sensory spine at midlength and at posterodistal angle, margin of palm bearing several tiny transparent scales; carpus triangular, with single posterodistal spine. Posterior pereopods with elongate rectangular propodus bearing four strong serrate spines anterodistally, shorter serrate sensory spine at midlength and at distal angle of posterior margin; with single posterodistal spine. Exopod of pleopod 1 operculiform with shallow groove on outer (anterior) surface; endopod about two-thirds length of, and one-third width of exopod, bearing three distal plumose setae. Uropodal exopod reaching midlength of endopod, elongate-ovate in outline, outer margin faintly sinuate, margins bearing plumose setae; endopod twice longer than wide, reaching telsonic apex, distally evenly rounded, with several elongate simple setae.

Remarks

Barnard (1925: 136) mentions two *Ingolf* stations for this species, and provides a measurement of 6.5 mm. As the present specimen, from station 78, measures 5.8 mm, it must be assumed that there was at least one other specimen, making the present non-ovigerous female a syntype.

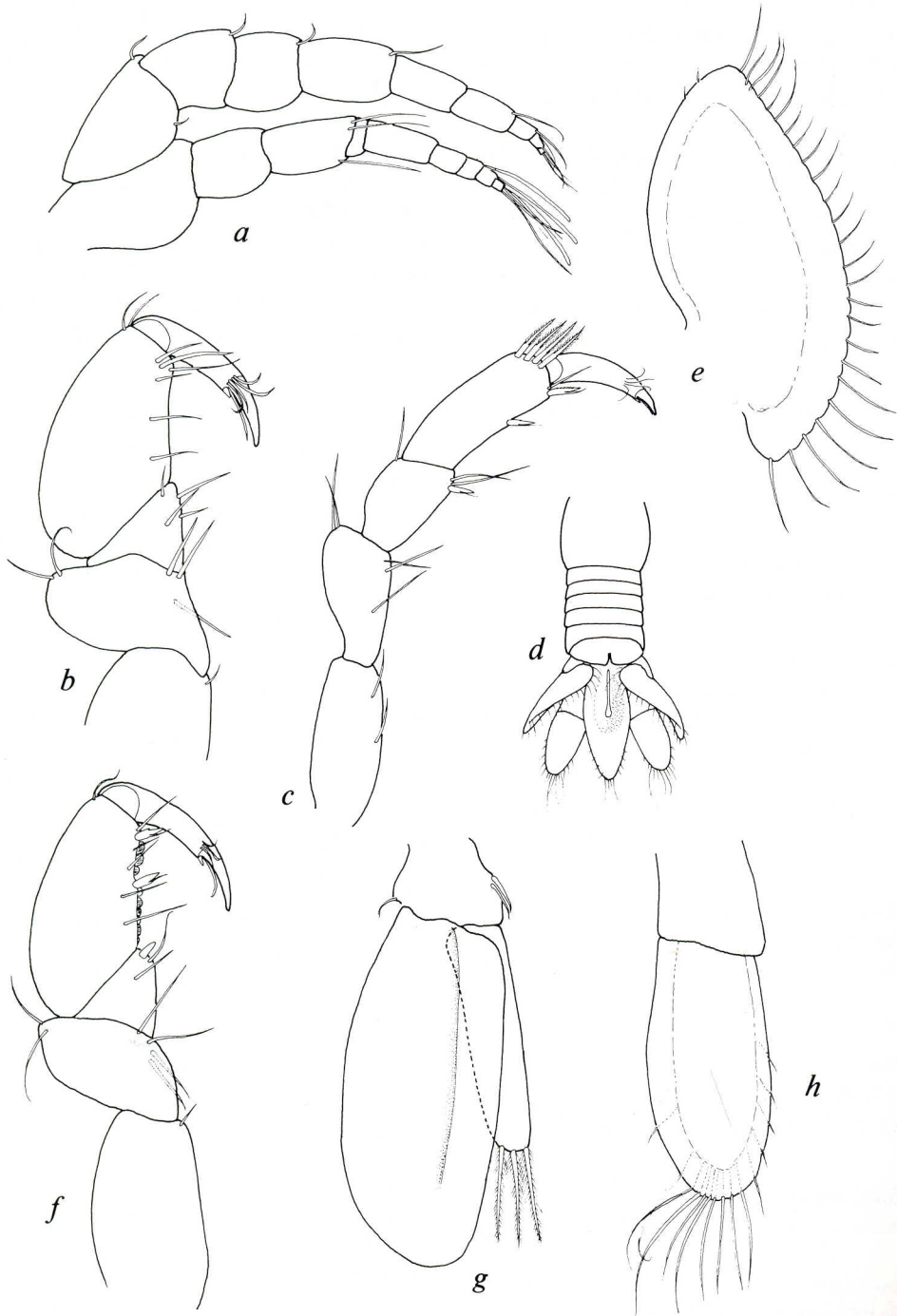


Fig. 2. *Anthelura sulcicauda*, syntype, non-ovig. ♀: a, antenna (upper) and antennule (lower); b, pereopod 1; c, pereopod 7; d, pleon in dorsal view; e, uropodal exopod; f, pereopod 2; g, pleopod 1; h, uropodal endopod.

While the mouthparts, and especially the maxilliped are missing, making positive generic identification difficult, in all other aspects, this specimen agrees with the definition of *Anthelura*.

The function and fine structure of the telsonic "capsule" seen in this species, as well as in *Valoranthura abyssorum* and to a less well developed degree in *Anthelura ovalis*, require investigation.

***Ananthura ovalis* Barnard, 1925**
(*Anthelura ovalis* (Barnard, 1925))

Fig. 3

Ananthura ovalis Barnard, 1925: 136, pl. 4 (fig. 10).

Anthelura ovalis: Kensley 1978a: 787; Negoescu 1980: 89.

Material examined: ZMUC, syntypes, 2 non-ovig. ♀, 5.5 mm, 4.2 mm; Syracuse, Sicily, Mediterranean Sea.

Description

Non-ovigerous female: Integument not indurate. Cephalon with dorsolateral eyes of very few ommatidia; rostrum reaching anteriorly as far as anterolateral angles. Pleonites 1-6 short, free. Telson elongate-lanceolate, widest at mid-length, posterior margin broadly rounded, faintly serrate; oval depression in anterior half having ridge-like anterior margin.

Antennular flagellum of 3 articles, middle article longest; 3 distal aesthetascs. Antennal flagellum of 6 setose articles. Mandibular palp with first and third articles subequal in length, middle article about twice length of first; terminal article with 5 distal serrate spines of which penultimate spine longest; incisor of single sclerotized cusp; lamina dentata of 7 serrations; molar rounded-truncate. Maxilliped of 5 articles, terminal article set obliquely on penultimate article, bearing 5 setae on mesial margin; strong endite present, reaching to proximal half of penultimate palp article, with 3 setae distally. Pereopod 1 subchelate, propodus somewhat expanded, palm straight, unarmed except for few setae. Pereopods 2 and 3 similar, subchelate, propodus not as expanded as in pereopod 1, palm straight, bearing 2 short stout sensory spines; carpus triangular, with single posterodistal stout sensory spine. Posterior pereopods with

propodi bearing single large serrate spine posterodistally; carpi triangular, with anterior margin much shorter than posterior margin, with single spine at posterodistal angle. Pleopod 1 exopod operculiform; endopod two-thirds length and about one-third width of exopod, with 3 distal plumose setae. Uropodal exopod distally ovate, proximally square, reaching distal half of endopod, margin bearing plumose setae, longest distally; endopod elongate-ovate, reaching telsonic apex, with numerous simple setae distally.

Remarks

The present species agrees in all except one respect with the definition of the genus *Anthelura* provided by Kensley (1978a: 787). The single exception is the presence of eyes - *A. ovalis* possesses small eyes of few ommatidia, all other species of *Anthelura* lack eyes.

Wägele (1980) described *Anthelura fresi* from off Corsica and Capri in the Mediterranean. This species differs from *A. ovalis* in several major features: *A. fresi* lacks eyes, possesses a distally narrower uropodal exopod with serrate margins, a less elongate uropodal endopod, more slender posterior pereopods, a non-serrate posterior margin of the telson, and a much shorter unguis of the dactylus of pereopod 1.

Negoescu (1980) recorded *A. ovalis* from Libya and Egypt, but did not figure or describe this material.

Anathura flexibilis Pasternak, 1982, from deep water in the Mediterranean has more articles in the flagellum of antenna 2, fewer spines on the mandibular palp, and more elongate uropodal rami, than *A. ovalis*.

***Ananthura abyssorum* (Norman and Stebbing, 1886)**

(*Valoranthura abyssorum* (Norman and Stebbing, 1886))

Ananthura abyssorum: Barnard 1925: 137.

Valoranthura abyssorum: Kensley 1978a: 790, figs. 8, 9; 1982a: 26, fig. 17.

Remarks

Kensley (1978a) redescribed and figured this spe-

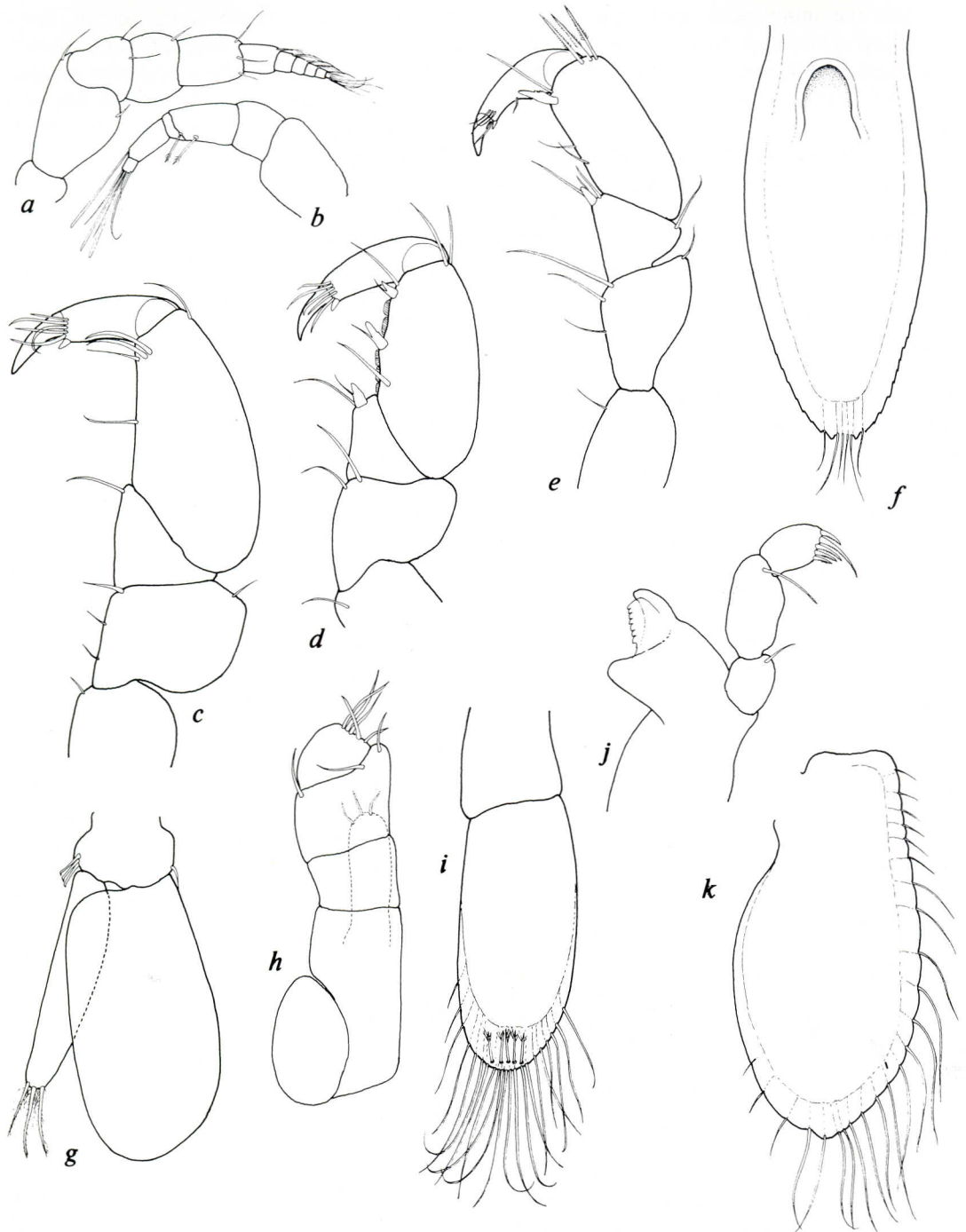


Fig. 3. *Anthelura ovalis*, syntype, non-ovig. ♀: a, antenna; b, antennule; c, pereopod 1; d, pereopod 2; e, pereopod 7; f, telson; g, pleopod 1; h, maxilliped; i, uropodal endopod; j, mandible; k, uropodal exopod.

cies, placing it in the genus *Valoranthura*. Poore (in litt., 20. viii. 1986) believes that this species belongs to *Ananthura* which he is redefining.

***Hyssura producta* Norman and Stebbing, 1886.**

Hyssura producta: Barnard 1925: 137, pl. 4 (fig. 16); Wägele 1981c: 54, fig. 6.

Remarks

Wägele (1981c) rediagnosed the genus *Hyssura*, and redescribed and figured the holotype of *H. producta*.

***Hyssura profunda* Barnard, 1925**

Hyssura profunda Barnard, 1925: 138, pl. 4, fig. 17.

Remarks

This species has not been recorded since Barnard's description.

***Xenanthura brevitelson* Barnard, 1925.**

Xenanthura brevitelson Barnard, 1925: 138, pl. 4, fig. 14; Kensley 1980a: 740, fig. 10.

Material examined: ZMUC, syntypes, 6 ♂, pre♂, 28 non-ovig. ♀, 15 juvs., NE of Hans Lollik (N of St Thomas), U.S. Virgin Islands, 50-60 m, 8 March 1906, leg. T. Mortensen.

Remarks

The species was redescribed and figured by Kensley (1980a).

***Cyathura carinata* (Krøyer, 1847)**

Cyathura carinata: Barnard, 1925: 140.

Remarks

This species is one of the most thoroughly investigated anthurideans (see Wägele 1979b, 1979c, 1981d, 1982a). Such work has shown that the geographic distribution provided by Barnard (1925: 140) is inaccurate. *Cyathura carinata* is limited to the north-eastern Atlantic; the records of North America, South Africa, and China are those of other species of *Cyathura*.

***Cyathura pusilla* Stebbing, 1904**

Cyathura pusilla: Barnard 1925: 140.

Remarks

This species has not been seen since Stebbing's records (1904, 1910) from Ceylon (Sri Lanka) and British East Africa (Kenya).

***Cyathura siamensis* Barnard, 1925**

(*Caenanthura siamensis* (Barnard, 1925))

Cyathura siamensis: Barnard, 1925: 140, pl. 4, fig. 6.

Caenanthura siamensis: Kensley 1978: 785, fig. 7.

Material examined. ZMUC, Lectotype, ovig. ♀, 5.8 mm, paralectotypes, 7 non-ovig. ♀, 3.9-6.4 mm, Koh Chang, Thailand, 6-10 m, leg. T. Mortensen, 1900.

Remarks

Because of the unique features of especially the mandible and maxilliped, Kensley (1978) placed this species in the genus *Caenanthura*.

***Cyathura indica* Barnard, 1925**

Figs. 4, 5.

Cyathura indica Barnard, 1925: 140, pl. 4 (fig. 7); 1935: 306; Nierstrasz 1941: 240; Miller and Burbanck 1961: 65; Pillai 1966: 153; Kensley 1980b: 15.

Material examined: ZMUC, syntypes, 3 ♂, 3.1 mm, 1 ovig. ♀, 6.1 mm, 6 non-ovig. ♀, 2.5-3.0 mm, Paumben, Adam's Bridge, Sri Lanka, 1-3 fms, April 1889, leg. K. Fristedt.

Other Material: 4 ♂, 8 non-ovig. ♀, between Kon Mesan and Cape Linut, Thailand, 9 fms, 4 February 1900, leg. T. Mortensen.—2 ovig. ♀, 1 non-ovig. ♀, Amboina Bay, Indonesia, 50 fms, dredged from rock and sand, 22 February 1900, leg. T. Mortensen.—1 non-ovig. ♀, North end of Koh Chang, Thailand, coral blocks, 1 fm, 9 March 1900, leg. T. Mortensen.—1 ovig. ♀, on coconut floating at surface near Koh Julu, Thailand, 3 February 1900, leg. T. Mortensen.—2 ♂, 13 non-ovig. ♀, 21 juvs., Paumben, India, 1-5 m, leg. K. Trister.

Description

Non-ovigerous female: Integument not indurate. Body proportions: $C < 1 > 2 = 3 < 4 < 5 > 6 > 7$. Pereonites with dorsolateral grooves, but no other obvious dorsal sculpture. Pleon slightly longer than pereonite 7; pleonites 1-5 fused, pleonite 6 dorsally free, with middorsal incision in posterior margin. Telson elongate-oval, widest in posterior half, with pair of basal statocysts, dorsally flat or very slightly concave.

Antennule short, squat; flagellum of 3 short articles, terminal article bearing 3 aesthetascs and few simple setae. Antenna finely setulose, fifth peduncular article longer than articles 3 or 4; flagellum of 2 very short setose articles. Mandibular palp with article 2 about 1 1/2 times length of article 1, slightly more than twice length of terminal article; latter with 5 finely

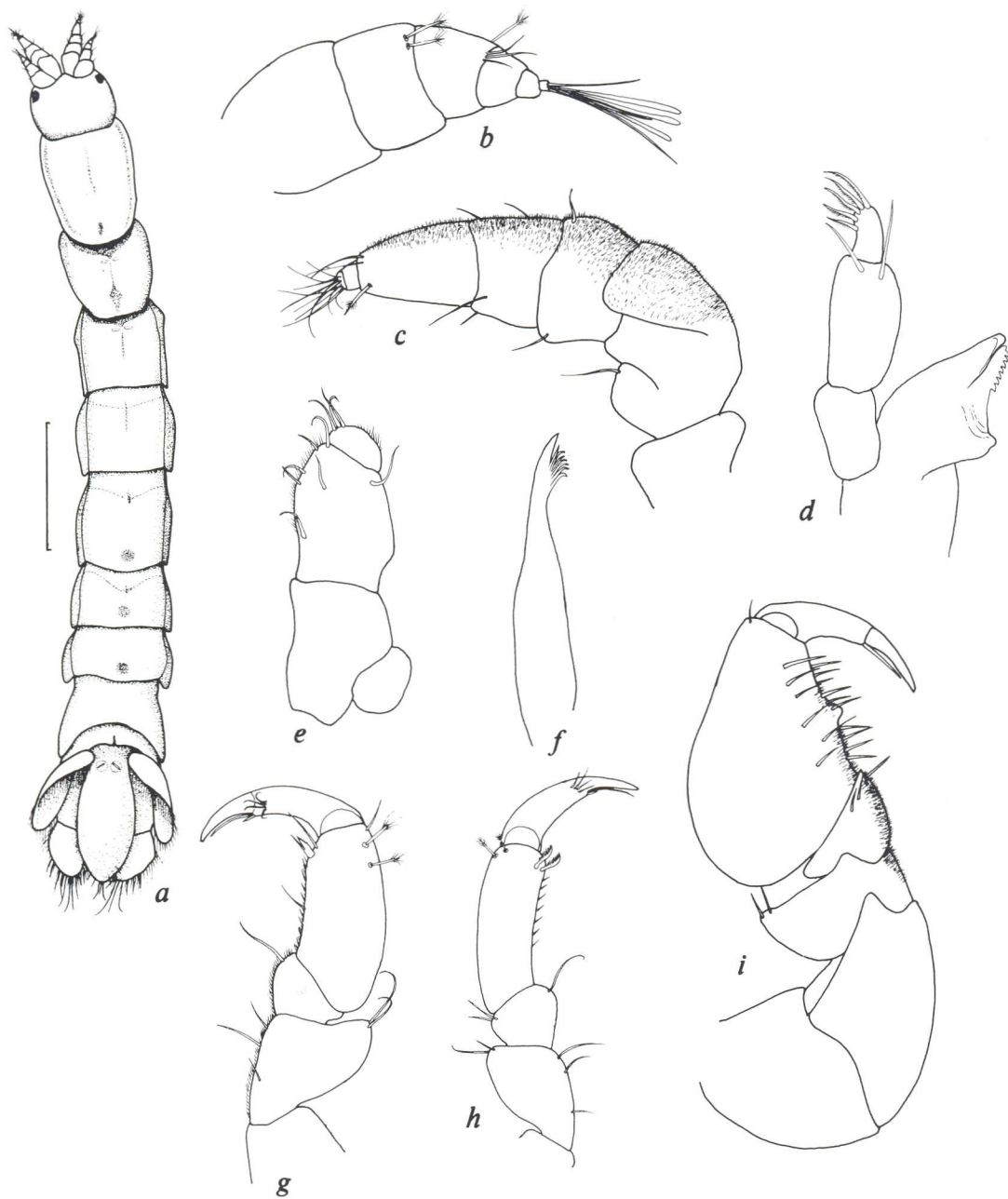


Fig. 4. *Cyathura indica*, syntype, ovig. ♀: a, whole animal in dorsal view; b, antennule; c, antenna; d, mandible; e, maxilliped; f, maxilla; g, pereopod 2; h, pereopod 7; i, pereopod 1. Habitus scale 1 mm.

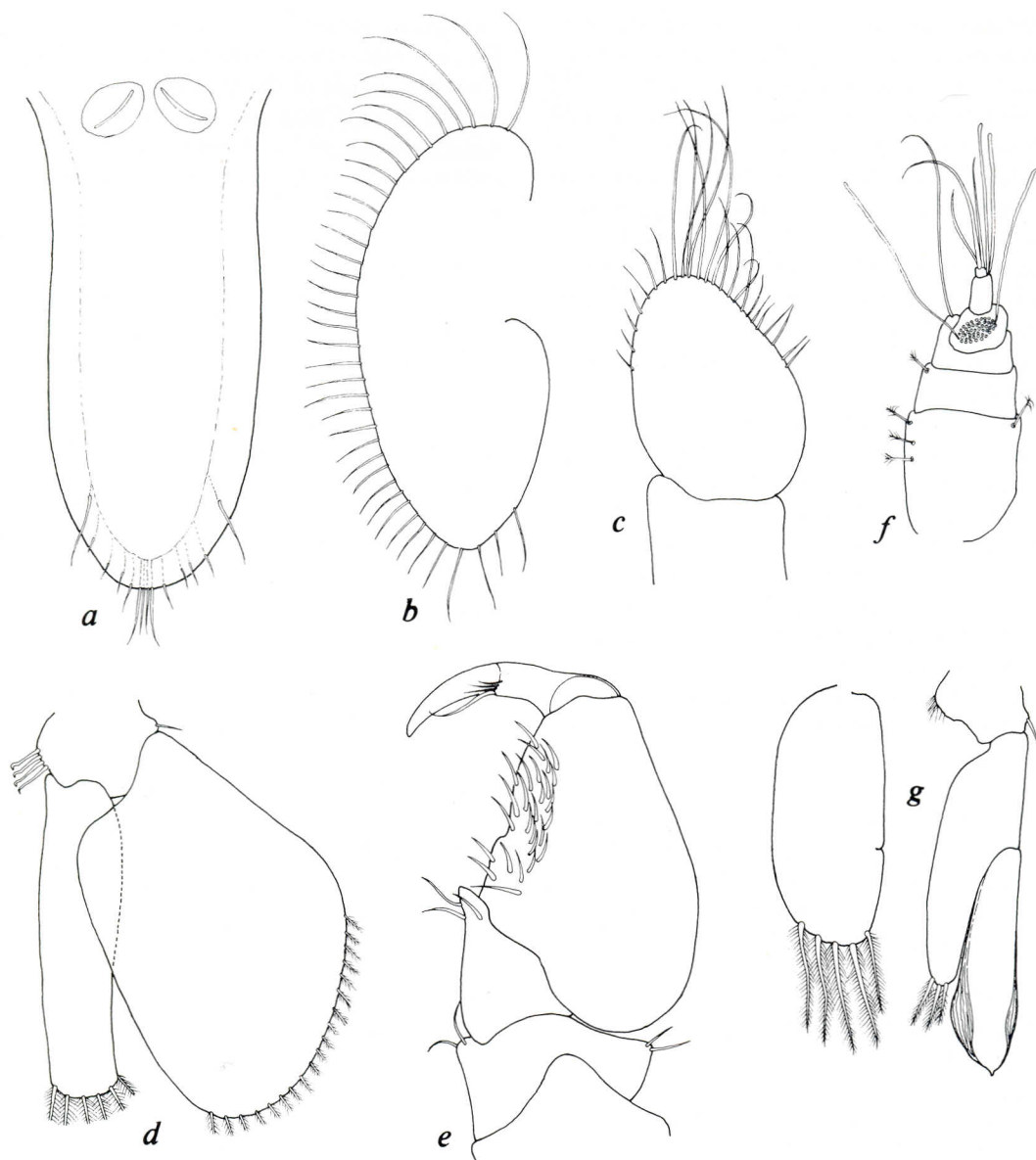


Fig. 5. *Cyathura indica*, syntype, ovig. ♀: a, telson; b, uropodal exopod; c, uropodal endopod; d, pleopod 1. Syntype, ♂: e, pereopod 1, mesial view; f, antennule; g, pleopod 2, exopod and endopod.

fringed distal spines; incisor of 2 ill-defined cusps, barely sclerotized; lamina dentata with 7 marginal serrations; molar short, poorly defined. Maxilliped of 4 articles, terminal article semicircular, set obliquely on article 3, with 3 se-

tae. Pereopod 1 with unguis two-thirds length of remainder of dactylus; propodus expanded, palm with several simple setae and rounded lobe at midlength; posterior margins of proximal propodus, carpus, and merus finely setulose.

Posterior pereopods with 2 fringed spines on posterodistal angle of propodus; carpus triangular, with anterior margin much shorter than posterior margin. Pleopod 1, exopod operculiform, almost 3 times wider than endopod, fringed with plumose setae; endopod only slightly shorter than exopod, bearing 6 distal plumose setae. Uropodal exopod elongate-oval, reaching midlength of endopod, margin bearing numerous plumose setae; endopod not quite reaching telsonic apex, oval in outline, 1 1/2 times longer than wide, margin setose, distal setae longest.

Male: Antennule squat, flagellum of 3 articles, article 1 set obliquely into peduncle article 3, with dense patch of elongate aesthetascs; article 2 slender, with few distal aesthetascs; article 3 minute, with few simple elongate setae and few aesthetascs. Pereopod 1, propodus expanded, palm with more of a notch than a rounded lobe in proximal half, numerous simple setae/spines in mesial surface; carpus triangular, distally produced into triangular lobe. Pleopod 2, exopod equal in length to endopod, bearing 5 distal plumose setae; endopod equal in length to endopod, bearing 5 distal plumose setae; endopod with 3 distal plumose setae, copulatory stylet very broad, articulating in proximal half of mesial margin, extending well beyond rami, widening distally, with tiny apical point and striate subapical membranous structure.

Remarks

Stebbing (1910) recorded a juvenile *Cyathura pusilla* from Wasin, British East Africa (see above), and noted that this juvenile possessed well developed eyes (unlike *C. pusilla* which was reported to lack eyes). Barnard (1935) noted that Stebbing's specimen could perhaps be *C. indica*, which is not sufficient evidence to synonymize *C. indica* with *C. pusilla*, as was done by Miller and Burbanck (1961: 66).

Of the 14 vials of specimens of *Cyathura* from the region of Thailand mostly collected by Dr. T. Mortensen, five were found to contain *Cyathura indica*, while the other nine contained *Cyathura rudloei* Kensley, 1980b. While these

two species are superficially very similar, several features make them easily distinguishable: 1. The third article of the mandibular palp in *C. rudloei* is more than half the length of the second article, much less than half the length in *C. indica*.—2. The endopod of pleopod 1 in *C. rudloei* is a very reduced and non-setose structure; in *C. indica* the endopod is almost as long as the exopod, and possesses several plumose setae distally.—3. The copulatory stylet of pleopod 2, in *C. rudloei* is elongate and scimitar-shaped, articulating close to the base of the ramus; in *C. indica*, this structure articulates near the midlength of the ramus which is somewhat reduced in width, and is distally expanded and wider than the ramus. Less obvious differences also exist in the degree of setation of the body and especially of the uropodal endopod, in the first pereopodal spination, the mandibular lamina dentata, and proportions of the antennae.

The structure of the copulatory stylet in *C. indica* would seem to be unique in the genus. Amongst estuarine and freshwater species of *Cyathura*, a distally complicated copulatory stylet is not unusual (see Botosaneanu and Stock, 1982, for a review of stygobiont species of *Cyathura*). While the marine species tend to have a simpler structure (see Poore and Lew Ton, 1985a), nothing approaching this expanded club-like structure has been described.

Cyathura crucis Barnard, 1925

(*Mesanthura crucis* (Barnard, 1925), n. comb.)

Figs. 6, 7

Cyathura crucis Barnard, 1925: 141, pl. 4, fig. 5; Miller and Burbanck 1961: 65.

Material examined: ZMUC, syntypes, 2♂, 6.2 mm (one damaged), 1 pre♂, 5.1 mm, 1 non-ovig. ♀, 5.9 mm, 4 juvs.; North of Buck Island, St Croix, U.S. Virgin Islands, 8 m (4 fms), 20 February 1906, leg. T. Mortensen.

Description

Non-ovigerous female: Integument non-indurate. Body proportions: C<1>2<3<4>5>6>7. Cephalon with well developed eyes. Pleonites 1-5 fused, with no dorsal demarking lines; pleonite 6 dorsally free, with middorsal notch in posterior margin. Telson with 2 basal

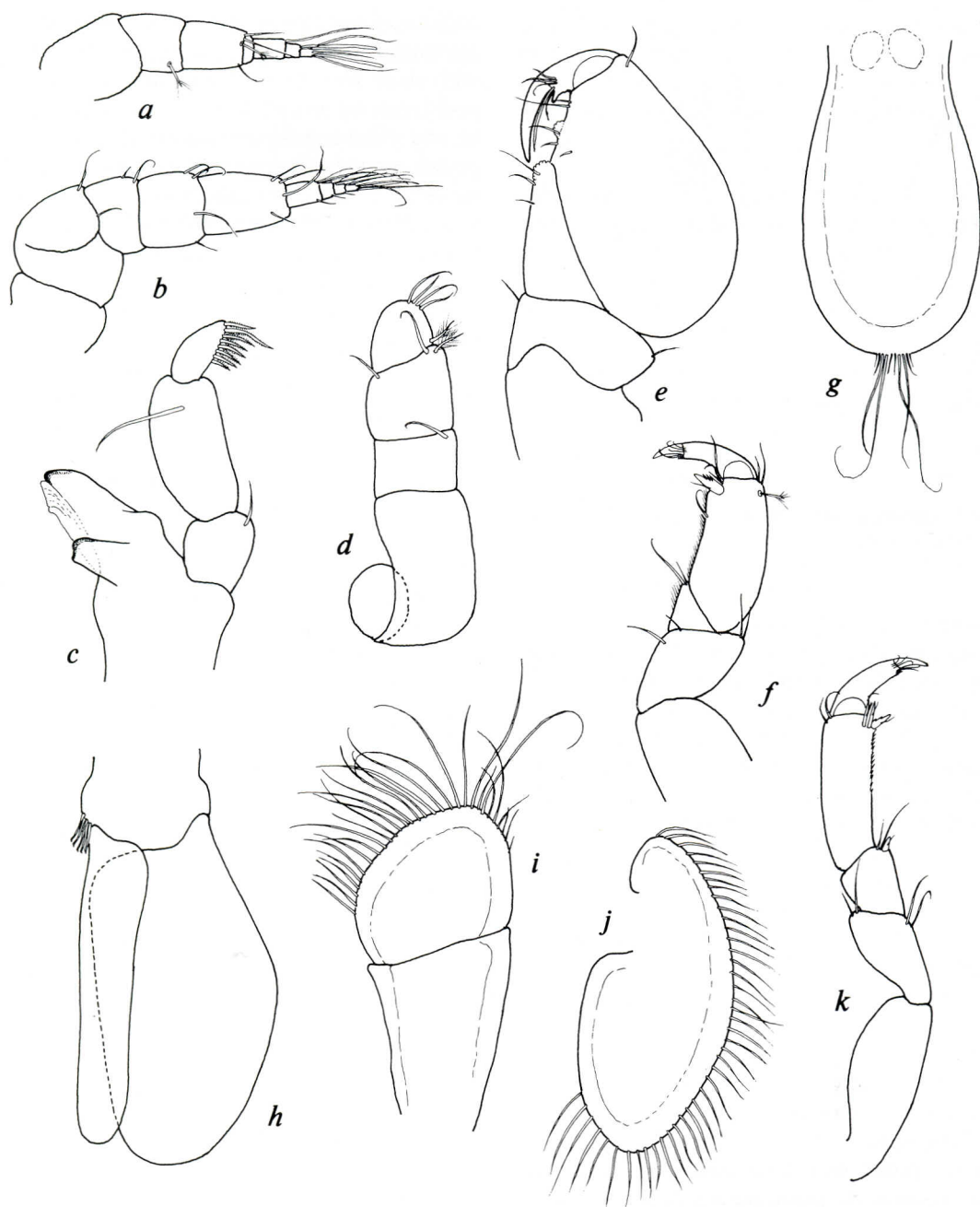


Fig. 6. *Apanthurus crucis*, syntype, non-ovig. ♀; a, antennule; b, antenna; c, mandible; d, maxilliped; e, pereopod 1; f, pereopod 2; g, telson; h, pleopod 1; i, uropodal endopod; j, uropodal exopod; k, pereopod 7.

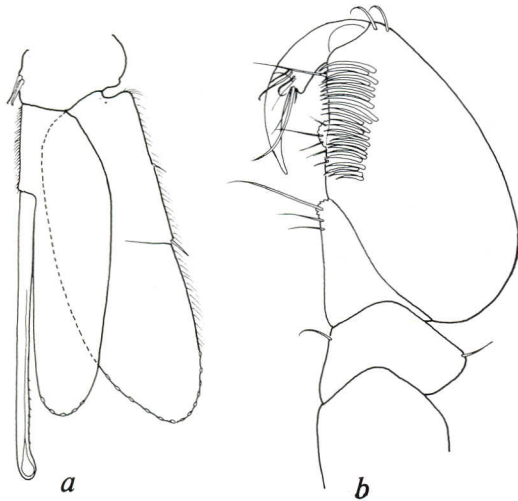


Fig. 7. *Apanthura crucis*, syntype, ♂: a, pleopod 2; b, pereopod 1, mesial view.

statocysts; dorsally slightly concave, posterior margin evenly and broadly rounded, with broad transparent border and terminal tuft of setae.

Antennular flagellum of 4 articles, second longest, 2 distal aesthetascs present. Antennal flagellum of 4 short setose articles. Mandibular palp with first and third articles each about half length of second article; article 3 with 8 distal fringed spines, penultimate spine longest; incisor of single slightly sclerotized cusp; lamina dentata with marginal serrations poorly defined; molar distally truncate, slightly sclerotized. Maxilliped of 5 articles; endite lacking; terminal article with distal margin broadly rounded, set obliquely on penultimate article. Pereopod 1, unguis about same length as remainder of dactylus; propodus expanded, palm straight, with rounded transparent lobe at about midlength, few simple setae on palmar margin; carpus triangular, distally rounded. Pereopods 2-3, unguis about one-third length of remainder of dactylus; propodus elongate-rectangular, with strong serrate sensory spine at posterodistal angle; carpus short, triangular. Posterior pereopods with propodus almost straight, elongate-rectangular, with 1 serrate and 2 sensory poste-

rodial spines; carpus with short anterior margin considerably shorter than posterior margin, with short sensory spine posterodistally. Pleopod 1, exopod operculiform, subequal in length to, and about one-third width of endopod. Uropodal exopod elongate-ovate, distally evenly rounded, almost entire margin bearing plumose setae; endopod reaching posteriorly to level of telsonic apex, broadly ovate-rounded, with numerous marginal elongate setae.

Male: Antennular flagellum having 12 or 13 discoid articles, each with dense band of aesthetascs. Pereopod 1, propodus slightly more elongate than in female, with dense band of curved spines on mesial surface near and parallel to palm. Pleopod 2, endopod with copulatory stylet articulating below proximal third of mesial margin; stylet extending well beyond apex of ramus, distally rounded.

Remarks

The structure of the antennae and antennules, especially the discoid articles of the male antennular flagellum, the mandible, pereopods, and especially of the maxilliped confirm that the present species belongs in *Mesanthura*. The relatively large terminal article of the maxilliped, the posteriorly broadly rounded telson, and the unnotched uropodal exopod all resemble *Mesanthura punctillata* Kensley, 1982c, from Belize. Minor differences are seen in the number of spines on mandibular palp article 3, and in the number of articles in the flagella of the female antenna and antennule. Unfortunately, the present material has lost all pigmentation, making a definite identification difficult.

Apanthura sandalensis Stebbing, 1900

Apanthura sandalensis Stebbing, 1900: 621, pl. 65A; Barnard 1925: 141.

Remarks

A number of species from a wide geographical range have been synonymized under the name *A. sandalensis*. Kensley (1982a) indicated some of this confusion. Poore and Lew Ton (1985b) re-examined the type material of *A. sandalensis*;

the various Indo-Pacific species referred to under this name, however, still require clarification.

***Apanthura xenocheir* Stebbing, 1910**

Apanthura xenocheir Stebbing, 1910: 94, pl. 7B; Barnard 1925: 142.

Remarks

This species, recorded from the Seychelles Islands and recently recollected, will be redescribed in the near future (Kensley, in prep.).

***Apanthura africana* Barnard, 1914**

(*Amakusanthura africana* (Barnard, 1914), n. comb.)

Apanthura africana Barnard, 1914: 340a, pl. 28C; 1925: 142; Kensley 1982a: 98, fig. 1

Remarks

This species was redescribed by Kensley (1982a) under the generic name *Apanthura*. As the work

of Poore and Lew Ton (1985b) has made clear, this species is a true *Apanthuretta*. The latter genus, however, is a junior synonym of *Amakusanthura* Nunomura (Poore, in litt., 15. ix. 1986).

***Apanthura coppingeri* Barnard, 1925**

(*Amakusanthura coppingeri* (Barnard, 1925), n. comb.)

Apanthura coppingeri Barnard, 1925: 142, pl. 4, fig. 12; Poore 1985: 136.

Remarks

Poore (1985) has examined the type of this species, and is assured that it is an *Amakusanthura*.

***Apanthura senegalensis* Barnard, 1925**

Figs. 8,9

Apanthura senegalensis Barnard, 1925: 143, pl. 4, fig. 11. Material examined: ZMUC, syntypes, 1 ♂, 6.9 mm, (mouthparts missing), 1 pre♂, 5.9 mm, 2 juvs, 1 manca; Dakar, Senegal, 5 fms, 21 February 1906, leg. Brinkmann.



Fig. 8. *Apanthura senegalensis*, syntype ♂: a, pereopod 1, mesial view. Syntype, pre♂: b, pereopod 1; c, antenna; d, mandible; e, maxilliped.

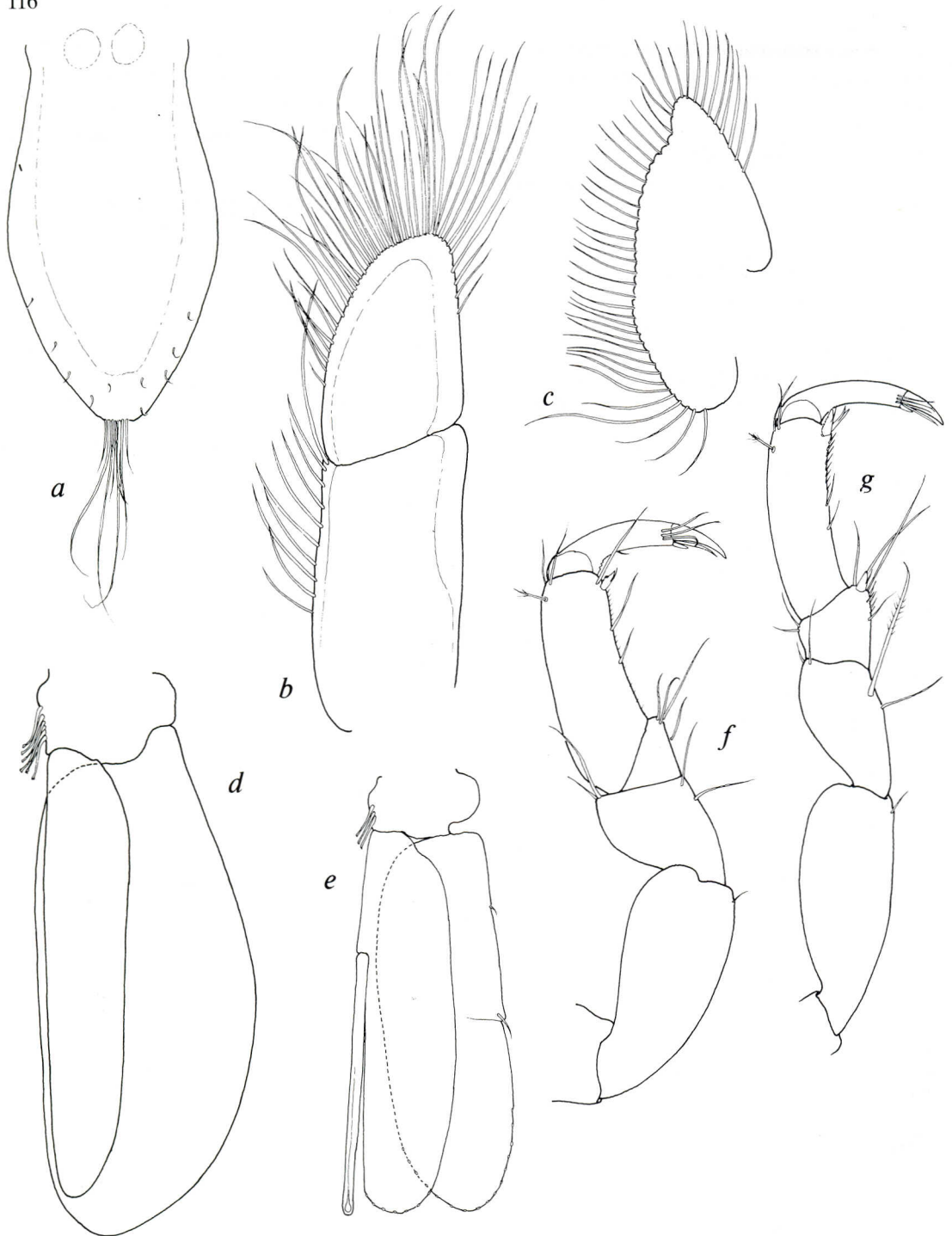


Fig. 9. *Apanthura senegalensis*, syntype, ♂: a, telson; b, uropodal basis and endopod; c, uropodal exopod; d, pleopod 1; e, pleopod 2; f, pereopod 2; g, pereopod 7.

Description

(based mostly on ♂, mouthparts from pre♂). Integument not indurate. Body proportions: C = 1 < 2 > 3 < 4 < 5 > 6 > 7. Cephalon with rostrum reaching further forward than anterolateral angles; eyes large, well pigmented. Pleonites 1-5 fused, lacking dorsal demarking lines; pleonite 6 dorsally free, with middorsal notch in posterior margin. Telson broadly lanceolate, widest at midlength, posteriorly blunt, with 8 terminal setae; dorsally faintly convex.

Antennular flagellum of 12 articles, each bearing dense band of aesthetascs. Antennal flagellum of 4 short setose articles. Mandible in pre♂ except for palp somewhat reduced, incisor and molar thin-walled, no lamina dentata visible; palp with third article slightly less than half length of second, armed with 5 distal fringed spines. Maxilliped of 5 articles, terminal article set in outer half of subterminal article; endite lacking. Pereopod 1 in pre♂ with propodus expanded, palm straight except for low proximal transparent flange, armed with few simple setae; carpus triangular, distally rounded. Pereopod 1 in ♂ with propodus having more marked transparent proximal lobe on palm, mesial surface near palm armed with dense band of spines. Pereopod 2, propodus elongate-rectangular, with single serrate spine at posterodistal angle. Posterior pereopods with propodi more elongate-rectangular than anterior pereopods, with strong serrate spine and more slender sensory spine posterodistally; carpus with anterior margin shorter than posterior, latter bearing single short spine posterodistally. Pleopod 1, exopod operculiform; endopod subequal in length but almost one-third width of exopod at its widest point; protopod bearing 6 retinacula. Pleopod 2, endopod with copulatory stylet articulating in proximal third of mesial margin, stylet barely extending beyond apex of ramus. Uropodal exopod with sinuous outer margin; almost entire margin bearing elongate plumose setae; endopod just reaching beyond telsonic apex, longer than wide, distally rounded, bearing numerous marginal elongate simple setae.

Remarks

Monod (1925) figured a male *Apanthura* species from the Atlantic coast of Morocco. From his figures, it would seem that the uropodal endopod is more elongate than in *A. senegalensis*, while the palm of pereopod 1 lacks a transparent lobe. From the same area, Monod (1925) described *Cyathura robertiana* which almost certainly is an *Apanthura*. The latter species would seem to have a broader uropodal exopod and maxilliped, than the present species, while the third article of the mandibular palp has only three distal spines.

Panathura serricauda (Barnard, 1920)

Panathura serricauda: Barnard 1925: 143; Wägele 1981a: 118, figs. 56-58; Kensley 1982a: 164, fig. 43.

Remarks

This species has been redescribed by Wägele (1981a) and Kensley (1982a).

Mesanthura catenula (Stimpson, 1855)

Mesanthura catenula: Barnard 1925: 143, fig. 9a; Kensley 1982a: 153, figs. 36, 37.

Remarks

This species has been redescribed by Kensley (1982a).

Mesanthura maculata (Haswell, 1881)

Mesanthura maculata: Barnard 1925: 144, fig. 9b.

Remarks

Poore and Lew Ton (1986) have shown that Haswell's *Mesanthura maculata* belongs to a species of *Accalathura*. The species that have been recorded from numerous Indo-Pacific localities under the name "*maculata*" require re-evaluation.

Mesanthura ocellata Barnard, 1925

Fig. 10

Mesanthura ocellata Barnard, 1925: 144, fig. 9b; Wägele 1984b: 398, figs. 8-10.

Material examined: ZMUC, syntypes, 5 non-ovig. ♀, 5.0-7.0 mm, 9 juvs.; Koh Kahdal, Thailand, from coral, 1 fm, January-February 1900, leg. T. Mortensen.

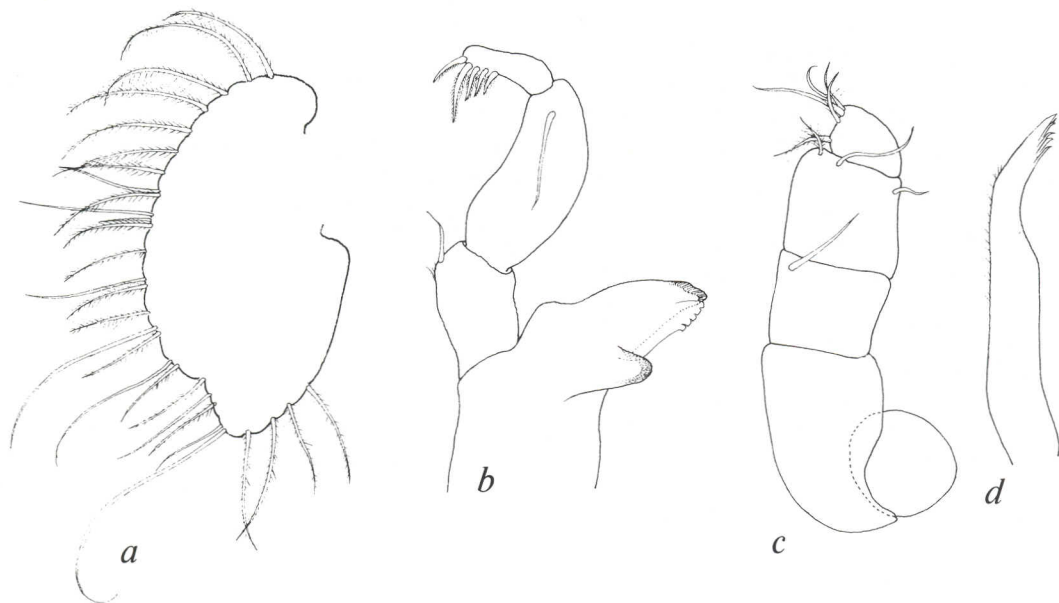


Fig. 10. *Mesanthura ocellata*, syntype, non-ovig. ♀: a, uropodal exopod; b, mandible; c, maxilliped; d, maxilla.

Remarks

The present syntypic material has lost all trace of integumental pigmentation. The material in the South African Museum is not paratypic, as stated by Wägele (1984b), but rather part of the syntypic series from which Barnard (1925) described the species. There is no mention of a holotype or paratypes in Barnard's description.

There would seem to be some degree of variation in the form of the uropodal exopod of this species. In the specimen figured by Wägele (1984b, fig. 10), the exopod is more strongly notched and more setose than in the syntypic female figured here.

Mesanthura albolineata Barnard, 1925

Fig. 11

Mesanthura albolineata Barnard, 1925: 144, fig. 9c; Wägele 1984b: 394, figs. 5-7.

Material examined: ZMUC, syntypes, 1 ovig. ♀, 10.9 mm, 1 non-ovig. ♀, 11.8 mm, 4 juvs.; Singapore, low tide, leg. 1906 or 1907.

Remarks

Unlike the syntype in the South African Museum, redescribed by Wägele (1984b), the Copen-

hagen Museum's syntypic material has lost all integumental pigmentation. Nevertheless, with the exception of one feature, Wägele's description agrees with the present material. The one exception lies in the number of oostegites in the ovigerous female. The Copenhagen syntypic ovigerous female has four oostegites, not three as given in Wägele's description (1984b: 402); this feature was also used to distinguish this species from *M. ocellata* Barnard. As may be seen from Figures 10b, c, and 11a, c, these species may be separated from each other on mandibular and maxillipedal structure: the terminal mandibular palp article in *M. ocellata* has five fringed spines, in *M. albolineata* nine; the penultimate maxillipedal article in *M. albolineata* has three setae near the mesial margin, while such spines appear to be absent in *M. ocellata*.

Mesanthura pulchra Barnard, 1925

Mesanthura pulchra Barnard, 1925: 145, fig. 9e; Kensley 1982c: 336, figs. 152, 153; Wägele 1984b: 389, figs. 1-4.

Mesanthura decorata Menzies and Glynn, 1968: 26, fig. 8. Synonymized by Kensley 1982c.

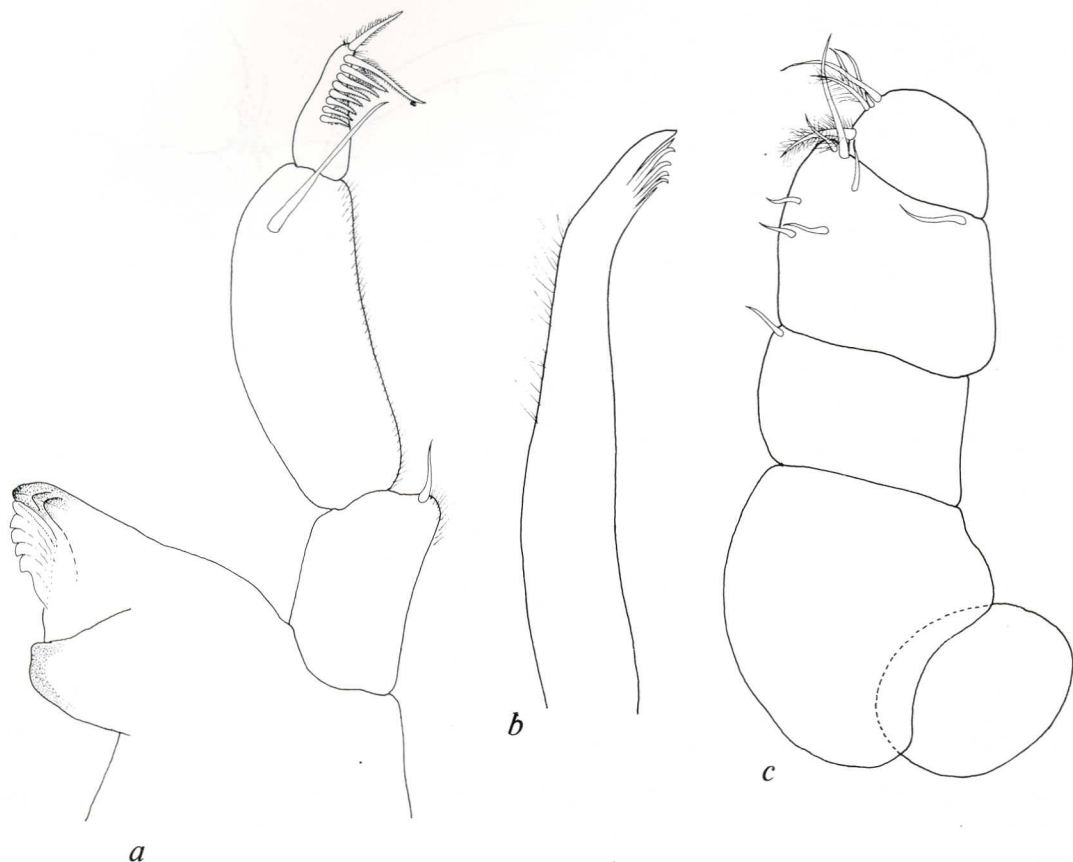


Fig. 11. *Mesanthura albolineata*, syntype, non-ovig. ♀: a, mandible; b, maxilla; c, maxilliped.

Material examined: ZMUC, lectotype, ovig. ♀ 6.5 mm, paralectotypes, 2♂ 4.7-5.4 mm, St Thomas, U.S. Virgin Islands, 20-30 m, 12 February 1898.

Remarks

As with the two previous species, the material in the South African Museum used by Wägele (1984b) for his redescription is syntypic rather than paratypic.

Skuphonura laticeps Barnard, 1925

Skuphonura laticeps Barnard, 1925: 145, fig. 10, pl. 4, fig. 15; Kensley 1980a: 731, fig. 5.

Material examined: ZMUC, syntypes, 3♂, 6.5-6.8 mm, St Thomas, U.S. Virgin Islands, 8-40 m.

Remarks

The species was redescribed by Kensley (1980a); the female specimen found in the syntypic series

was not used, as some doubt was expressed about its being conspecific with the three male syntypes.

Kupellonura mediterranea Barnard, 1925

Fig. 12

Kupellonura mediterranea Barnard, 1925: 146, pl. 4, fig. 13; Wägele 1981c: 56, figs. 7-13.

Material examined: ZMUC, holotype, ♂ (fragmented); Messina, Sicily, leg. H. J. Hansen.

Remarks

Pereopods 1 and 2, and pleopod 2 of the holotypic male are figured. The pereopods differ from those of the premale figured by Wägele (1981c, fig. 9, 10), in having the propodal palm of pereopod 1 slightly more elongate and armed with more fringed spines, and the propodal

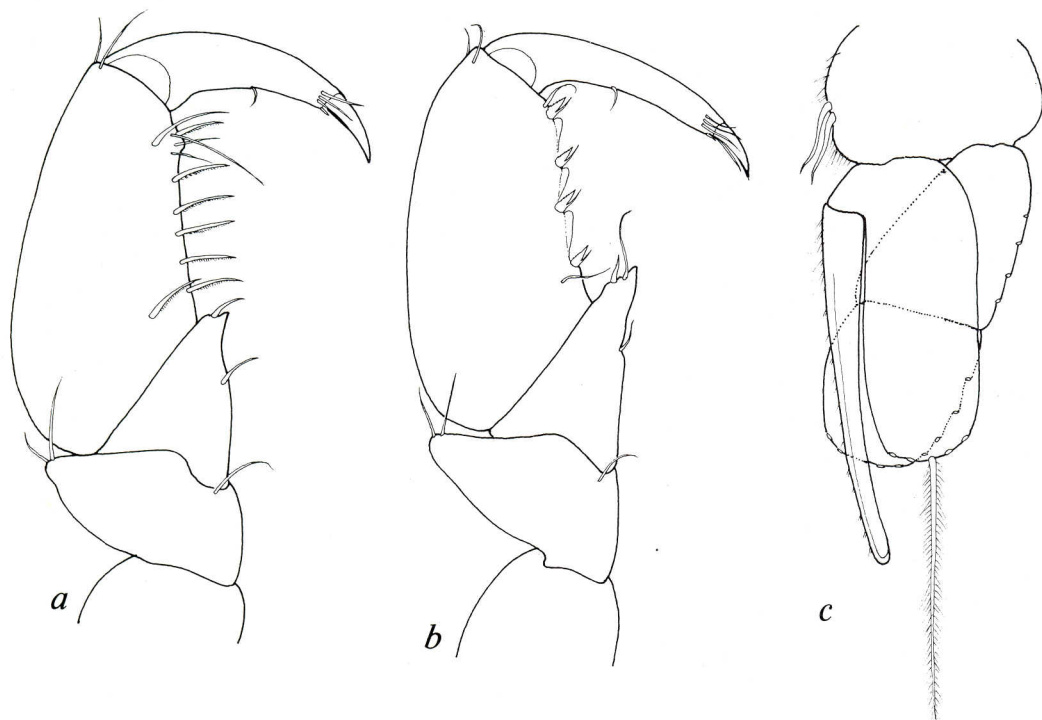


Fig. 12. *Kupellonura mediterranea*, holotype, ♂: a, pereopod 1; b, pereopod 2; c, pleopod 2 (all except one seta omitted).

palm of pereopod 2 slightly more elongate and armed with one more (i.e. four) short sensory spine.

“*Hyssura*” *spinicauda* Walker, 1901
(*Neohyssura spinicauda* (Walker, 1901))

“*Hyssura*” *spinicauda*: Barnard 1925: 147.

Neohyssura spinicauda: Amar 1953: 353, figs. 2-3; Wägele 1981c: 73, figs. 24-30.

Remarks

Barnard (1925: 147) stated that “this species obviously does not belong to *Hyssura*”, but did not designate a genus for it. Amar (1953) created the genus *Neohyssura*, after seeing a specimen from Corsica. Fresi (1970) and Wägele (1981c) have added to the description of this species.

SECTION B

All the species in Barnard’s Section B now belong to the family Paranthuridae Menzies and

Glynn, 1968. Poore (1980) revised, and provided a key to, the genera of this family.

***Accalathura crenulata* (Richardson, 1901)**

Accalathura crenulata: Barnard 1925: 147, pl. 4, fig. 18.

Material examined: ZMUC, 1 non-ovig. ♀, 11.9 mm, St Thomas and St John, U.S. Virgin Islands, 30-40 m, 23 December 1905, leg. T. Mortensen.—2 non-ovig. ♀, 8.2 mm, 10.0 mm, of Thatch Island, near St John, U.S. Virgin Islands, 12 March 1906, leg. T. Mortensen.—2 non-ovig. ♀, 14.4 mm, 18.3 mm, The Narrows, St John, U.S. Virgin Islands, 33 m, 17 March 1906, leg. T. Mortensen

Remarks

Menzies and Glynn (1968) designated this as the type species of the genus.

***Accalathura gigas* (Whitelegge, 1901)**

Accalathura gigas: Barnard 1925: 148; Kensley 1980: 3, 5; Poore 1980: 59.

Remarks

Barnard (1925) synonymized *A. gigas* with *A. sladeni* (Stebbing, 1910), but this was not sup-

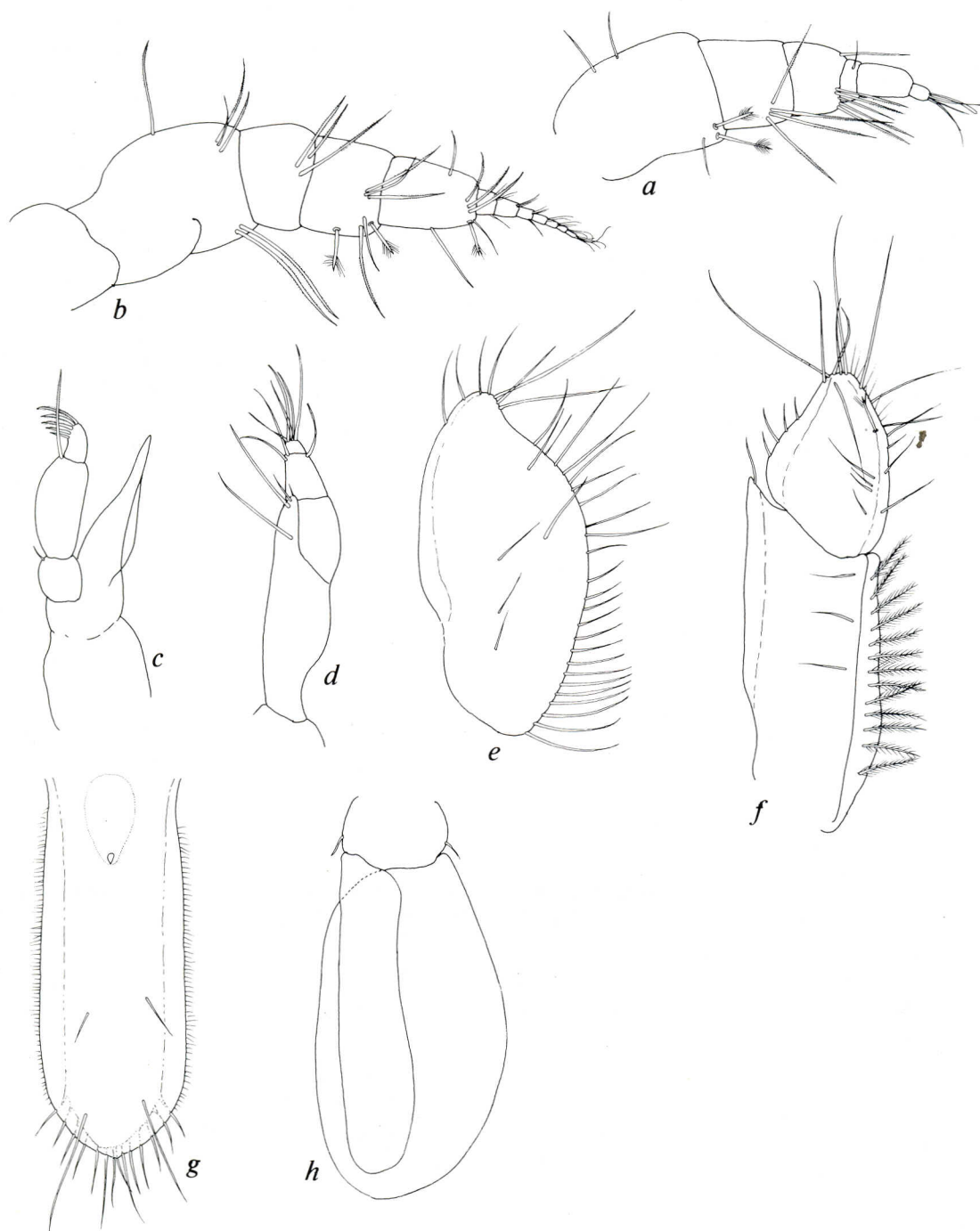


Fig. 13. *Virganthura crassa*, syntype, non-ovig. ♀: a, antennule; b, antenna; c, mandible; d, maxilliped; e, uropodal exopod; f, uropodal basis and endopod; g, telson; h, pleopod 1 (marginal setae omitted).

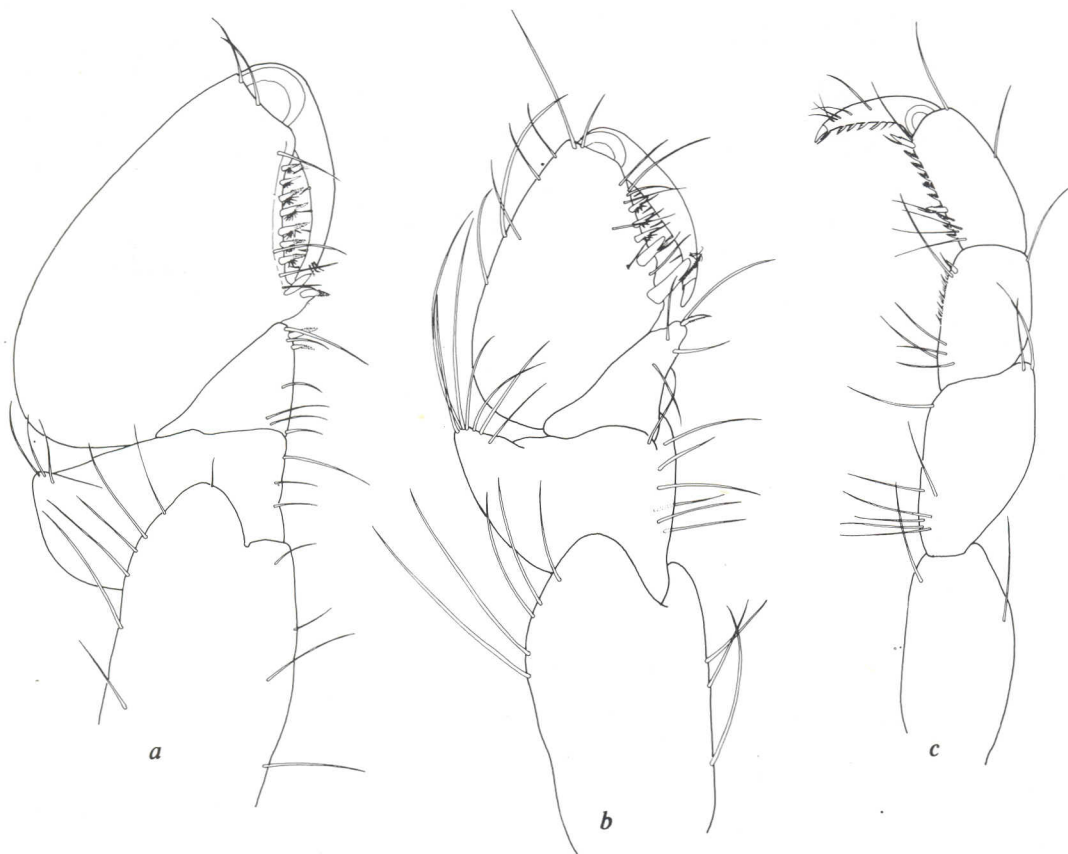


Fig. 14. *Virganthura crassa*, syntype, non-ovig. ♀: a, pereopod 1; b, pereopod 2; c, pereopod 7.

ported by Hale (1937). Kensley (1980b) redescribed and figured *A. sladeni*. Kussakin (1968) noted the possibility that *A. gigas* and *A. gigantissima* from the Antarctic might be synonymous, as Whitelegge's description (1901) of the South Australian material might be inaccurate. Poore (1981), however, has demonstrated that these two species are distinct, and has redescribed both.

Accalathura borradalei (Stebbing, 1904)

Accalathura borradalei: Barnard 1925: 149; Monod 1971: 335, figs. 1-19; 1972: 863, figs. 1-14.

Material examined: ZMUC, 1 manca 5.0 mm (telson missing), 1 post-manca 6.9 mm (pereopod 7 not fully developed, telson missing), between Koh Chuen and Koh Chang, Thailand, 30 m, 3 March 1900, leg. T. Mortensen

Remarks

Monod (1971, 1972) has figured two specimens from the Indian Ocean.

Accalathura crassa Barnard, 1925

(*Virganthura crassa* (Barnard, 1925), n. comb.)

Figs. 13, 14

Material examined: ZMUC, syntypes, 3 non-ovig. ♀ 4.5 mm, 5.5 mm, 6.8 mm, 1 non-ovig. ♀ 6.5 mm (telson missing), U.S. Virgin Islands, 30 m, 9 March 1906, coll. T. Mortensen. This sample is most probably "Off Cruz Bay (St John)".

Description

Non-ovigerous female. Body proportions: $C < 1 > 2 = 3 < 4 = 5 > 6 > 7$. Cephalon with short rostral point. Eyes of about 8 ommatidia situated in anterolateral lobes. Pleonites short,

distinct. Telson almost 3 times longer than wide, dorsally flat, parallel-sided for 3/4 of length, posteriorly rounded, with transparent border, several posterior setae; large basal statocyst present.

Antennule, basal peduncular article wider, but equal in length to 2 distal articles together; articles 2 and 3 with ventrodial clusters of elongate, finely fringed setae; flagellum of 3 articles, middle article longest; terminal article with single aesthetasc.

Antennal peduncular articles 2-4 bearing elongate, finely fringed setae; flagellum of 7 short articles, together longer than peduncle article 5 by terminal article.

Mandibular palp of 3 articles, article 2 2.3 times longer than basal article; article 3 slightly shorter than article 1, bearing comb of 5 fringed spines.

Maxillipedal endite reaching to distal margin of basal palp article, bearing 2 elongate setae near medial margin; palp of 3 articles, 2 basal articles large, terminal article 1/3 length of second, with cluster of terminal setae.

Pereopod 1 subchelate, larger than pereopods 2 and 3; dactyl with short oblique unguis; propodus expanded, palm slightly concave, bearing 7 spicate spines and few elongate setae, with short proximal lobe bearing single spine; carpus triangular, with 2 posterodistal spines.

Pereopod 2, propodus smaller and less expanded than in pereopod 1, palm bearing 3 short distal spicate spines, and 2 large proximal sensory spines; carpus triangular, with single posterodistal spine and seta.

Pereopods 4-7 with posterior margins of dactyl, propodus, and distal carpus bearing fringed scales, becoming setules proximally; propodus rectangular, with sensory spine at posterodistal angle and another in proximal half; carpus with anterior margin only slightly shorter than posterior; latter with small posterodistal sensory spine; propodus, carpus, and merus each with loose clump of elongate setae proximoposteriorly.

Pleopod 1, exopod operculiform, slightly longer, and 2.6 times wider than endopod; latter

with 4 elongate plumose setae on distal margin.

Uropodal exopod ovate, longer than wide, outer margin sinuate, fringed with elongate setae; endopod tapering distally to rounded apex, bearing several elongate setae and with transparent border, articulating obliquely on basis; latter with mediobasal angle subacutely produced, lateral margin with row of plumose setae.

Remarks

For the diagnosis of *Virganthura*, see Appendix, page 139.

Leptanthura tenuis (Sars, 1872)

Leptanthura tenuis: Barnard 1925: 150.

Remarks

Wägele (1981e) has redescribed this North Atlantic species in great detail and with copious figures. Kussakin (1982: 41, figs. 23, 24) has also provided figures.

Leptanthura affinis (Bonnier, 1896)

Leptanthura affinis: Barnard 1925: 150.

Remarks

Kensley (1982b) redescribed this North Atlantic species. Comparison of Kensley's figures of *L. affinis* with those of Wägele's *L. tenuis* shows that these species are quite distinct, in spite of Barnard's assertion that the two species are probably identical. Uropodal and telsonic shape easily separate these two species.

Leptanthura glacialis Hodgson, 1910

Leptanthura glacialis: Barnard 1925: 150.

Remarks

Kensley (1982b: 35, fig. 26, pls. 5-6) provided scanning electron micrographs of this austral species.

Leptanthura orientalis Barnard, 1925

Fig. 15

Leptanthura orientalis Barnard, 1925: 150.

Material examined: ZMUC, holotype, ♂, 5.3 mm (telson missing), Singapore, 22 July 1907. (Barnard gives the length of this specimen as 7.0 mm.)

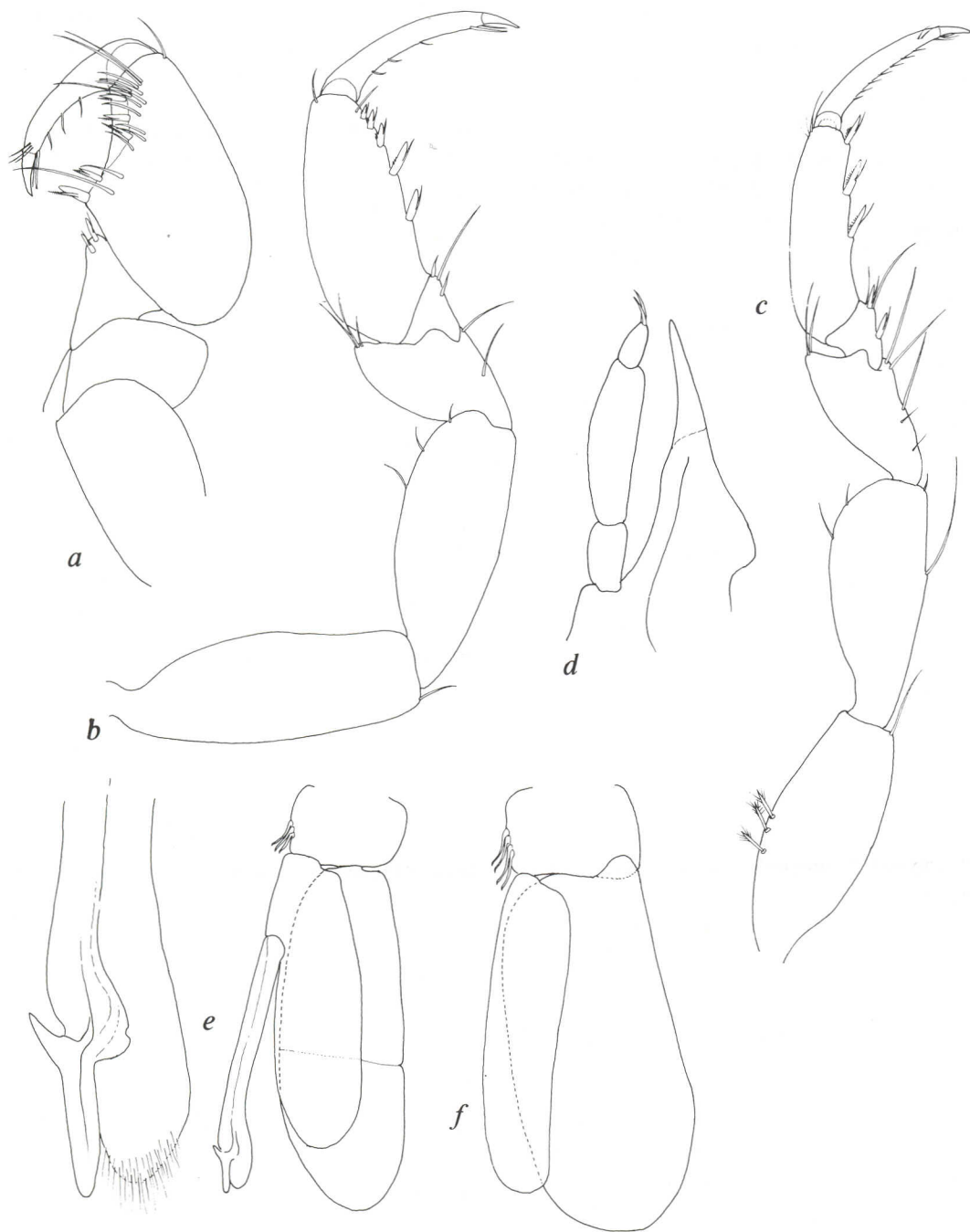


Fig. 15. *Leptanthura orientalis*, holotype, ♂: a, pereopod 1; b, pereopod 2; c, pereopod 7; d, mandible; e, pleopod 2 (marginal setae omitted), with apex of copulatory stylet enlarged; f, pleopod 1 (marginal setae omitted).

Description

Proportions: $C=1=2<3<4=5>6>7$. Cephalon with short rounded rostrum; eyes lacking. Pleonites 1-5 free, short.

Antennular flagellum of 12 articles each bearing whorl of aesthetascs. Antennal flagellum of 4 articles. Mandibular palp of 3 articles, article 2 $2\frac{1}{2}$ times length of article 1, terminal article bearing 2 apical spines. Maxilliped missing.

Pereopod 1 shorter but stouter than pereopods 2 and 3, propodus expanded, palm slightly concave, with 5 sensory spines and several simple setae on mesial surface; carpus with 2 sensory spines distally. Pereopod 2, propodus not expanded, with 5 sensory spines on posterior margin; carpus short, triangular, lacking spines. Posterior pereopods, propodus with 3 serrate sensory spines on posterior margin; carpus short, triangular, with very short free anterior margin, with 2 sensory spines on posterior margin. Pleopod 1, exopod operculiform, longer and wider than endopod; latter with 9 elongate distal plumose setae. Pleopod 2, exopod longer than endopod, with transverse suture slightly beyond midlength; endopod with copulatory stylet articulating in proximal half of mesial margin; copulatory stylet distally reaching beyond endopod, with bilobed apex and subapical backwardly directed acute lobe. Telson and uropods missing.

Remarks

Unfortunately, only the holotype of this species has been collected. This specimen was dissected by Barnard, and the maxillipeds, telson, and uropods are missing. As a result, the characteristic telson with its large single statocyst, and the broad uropodal exopods cannot be figured, and some doubt must exist, regarding the generic placement of this species. This doubt is further strengthened by the character of the anterior three pairs of pereopods. In true *Leptanthura* these are similar, but with pereopod 1 larger than pereopods 2 and 3. The present species possesses non-subchelate pereopods 2 and 3. The copulatory stylet of *Leptanthura* is usually

a simple cylindrical rod, occasionally flexed or slightly expanded terminally (see Poore, 1978, Kensley, 1982). In *L. orientalis*, the copulatory stylet is terminated by a structure unprecedented in *Leptanthura*. Until further material, preferably from Singapore, is examined, the species is left in *Leptanthura*, with strong doubts being expressed.

Leptanthura thori Barnard, 1925

Fig. 16

Leptanthura thori Barnard, 1925: 151; Kussakin, 1982: 43. Material examined: ZMUC, holotype, ♂, 6.3 mm (telson missing), Thor sta 166, North Atlantic, 62°57'N, 19°58'W, 957 m. (Barnard gives the length of the specimen as 7 mm.)

Description

Proportions: $C<1<2=3<4=5>6>7$. Eyes absent. Pleonites short, free.

Antennular flagellum of 11 articles bearing aesthetascs. Antennal flagellum equal in length to peduncle article 5, of 4 short articles. Mandibular palp, article 2 slightly more than twice length of article 1; article 3 slender, with single terminal spine. Maxilliped, endite not quite reaching base of first palp article, with single terminal seta; palp of 3 articles, 2 distal articles together one-third length of article 1.

Pereopods 1-3 missing. Pereopod 7, dactyl elongate, slender, gently curved, as long as propodus and carpus together; propodus with 3 sensory spines on posterior margin; carpus short, triangular, with 2 spines and single seta at posterodistal angle. Pleopod 1, exopod operculiform, with ridge on outer (anterior) surface close to mesial margin; endopod slightly shorter, and slightly less than half width of exopod. Pleopod 2, rami subequal; exopod with transverse suture in proximal half near midlength; endopod with copulatory stylet articulating at proximal fourth of mesial margin; stylet simple, rodlike, with apex slightly flexed laterally.

Remarks

The holotype is the only known specimen of this species. Having been dissected by K. H. Barnard, the anterior pereopods, uropods, and telson are missing, making a full description and

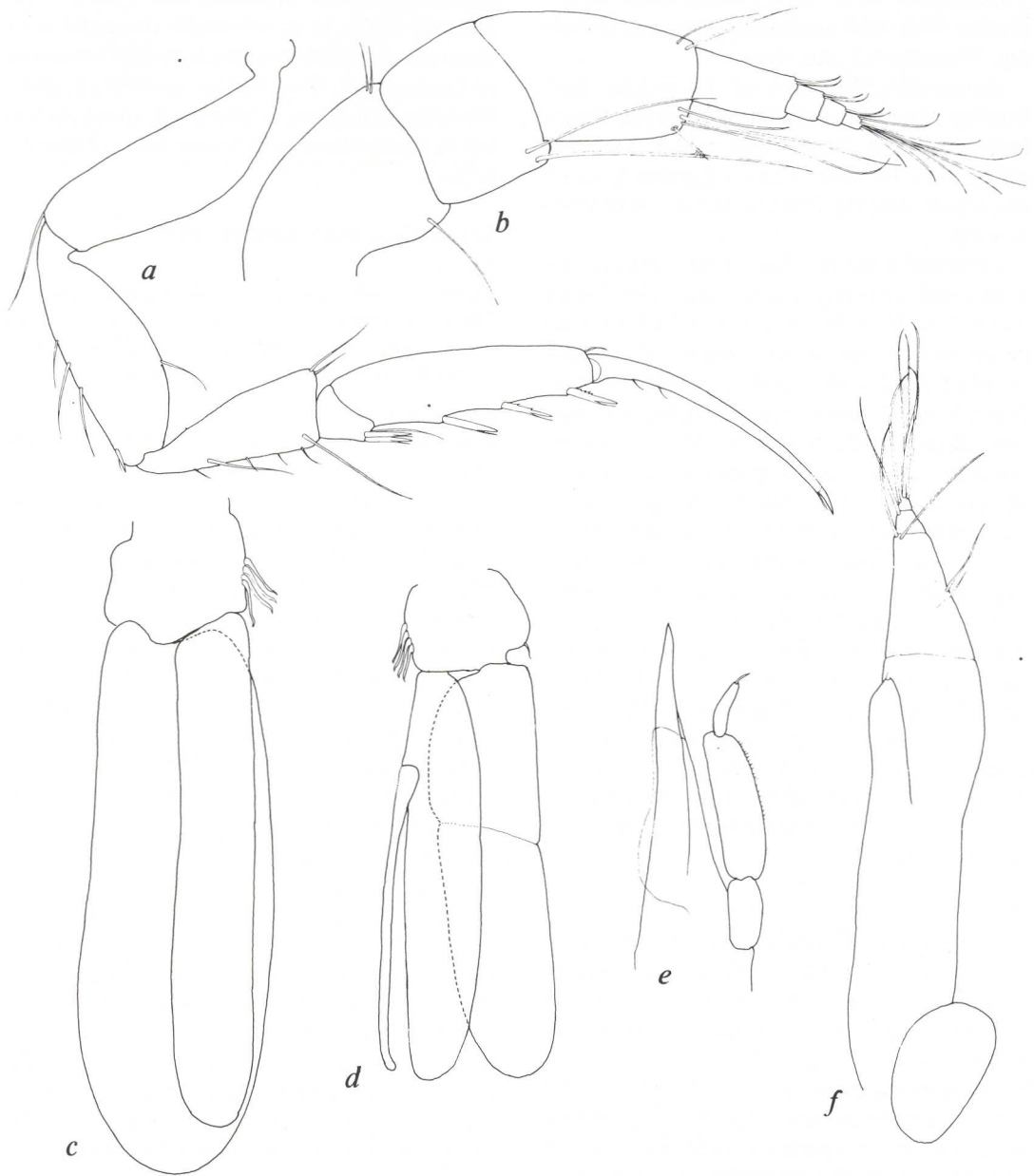


Fig. 16. *Leptanthura thori*, holotype, ♂: a, pereopod 7; b, antenna; c, pleopod 1 (marginal setae omitted); d, pleopod 2 (marginal setae omitted); e, mandible; f, maxilliped.

comparisons difficult. Barnard (1925: 151) notes that the species resembles *L. tenuis* (Sars) but has the telson widest at the base, narrowing very slightly to the rounded apex, and with a more pointed uropodal endopod. Wägele (1981e) has redescribed Sars' species. From Wägele's figures, it would seem that *L. thori* is perhaps a distinct species. The second mandibular palp article, the flagellum of antenna 2, and the posterior pereopods would all seem to be more slender and elongate. *Leptanthura thori* has three posterior spines on the propodus of pereopod 7 (*L. tenuis* has two), while the dactylus would seem to be relatively more elongate, reaching back to the carpal base. Nevertheless, these two species are very similar in all other structures available for comparison.

***Leptanthura laevigata* (Stimpson, 1855)**

Leptanthura laevigata: Barnard 1925; Kensley 1982a: 177, figs. 52-53.

Remarks

Kensley (1982a) rediagnosed and figured this common South African species.

***Leptanthura truncata* Richardson, 1911**

Figs. 17, 18

Leptanthura truncata Richardson, 1911: 5; Barnard 1925: 151; Poore, 1980: 62.

Material examined: USNM 42173, syntypes, pre σ (in 3 pieces) 17.4 mm, non-ovig. ♀ 10.0 mm, *Talisman* dredge 88, off West Africa, north of "Banc d'Arguin", 888 m, 13 July 1883.

Description

Pre-male: Proportions: $C < 1 = 2 < 3 < 4 > 5 > 6 > 7$. Cephalon with anterolateral lobes rounded, extending beyond small triangular rostrum; eyes absent. Pereonites 5-7 each with pair of large anteroventral lobes and smaller posteroventral pair of lobes; lobes becoming smaller posteriorly, small on pereonite 7 (lobes absent in female). Pleonites 1-5 free, short; pleonite 1 twice middorsal length of pleonite 2; pleonites 2-5 subequal; pleonite 6 dorsally demarked. Telson basally narrow, widening to

broadly rounded posterior margin, dorsally concave, with large anterior statocyst; surface patterned with imbricate scales or ridges.

Antennular flagellar articles numbering about 15, distal articles obscure, aesthetascs not yet developed. Antennal flagellum of 3 articles. Mandibular palp with article 2 about 2.5 times length of article 1; article 3 short, narrow, bearing 2 apical spines. Maxilliped with short endite just reaching base of first palp article; palp with 3 distal setae, segmentation obscure.

Pereopod 1, propodal palm almost straight, with low proximal lobe bearing short spine; medial surface near palmar margin with dense row of setae. Pereopod 7, dactylus slender, curved, subequal in length to propodus; latter with 3 sensory spines on posterior margin; carpus short, triangular, with 2 sensory spines on posterior margin. Pleopod 1, basis with 6 retinacula; exopod operculiform, with ridge on anterior surface near lateral margin, and another some distance from mesial margin; endopod slightly shorter and just less than half width of exopod. Pleopod 2, exopod longer than endopod, with transverse suture distal to midlength; endopod with slender simple copulatory stylet articulating distal to proximal third of mesial margin. Uropodal exopod broadly ovate; endopod triangular, distally narrowly rounded; basis triquetrous.

Remarks

The shape of the ventral lobes of pereonites 5-7 of the male, along with the telsonic and uropodal shape, serve to distinguish this species from its congeners. Ventral pereonite lobes are also seen in *L. natalensis* Kensley, 1978b, from Natal, South Africa in 690-850 m. *Leptanthura truncata* has in common with *L. natalensis* a brittle and somewhat indurate integument, and pereonites more elongate than in the shallower-dwelling species of *Leptanthura*.

Leptanthura truncata does not seem to have been collected since the *Talisman* specimens.

***Leptanthura chiltoni* (Beddard, 1886)**

Leptanthura chiltoni: Barnard, 1925: 151.

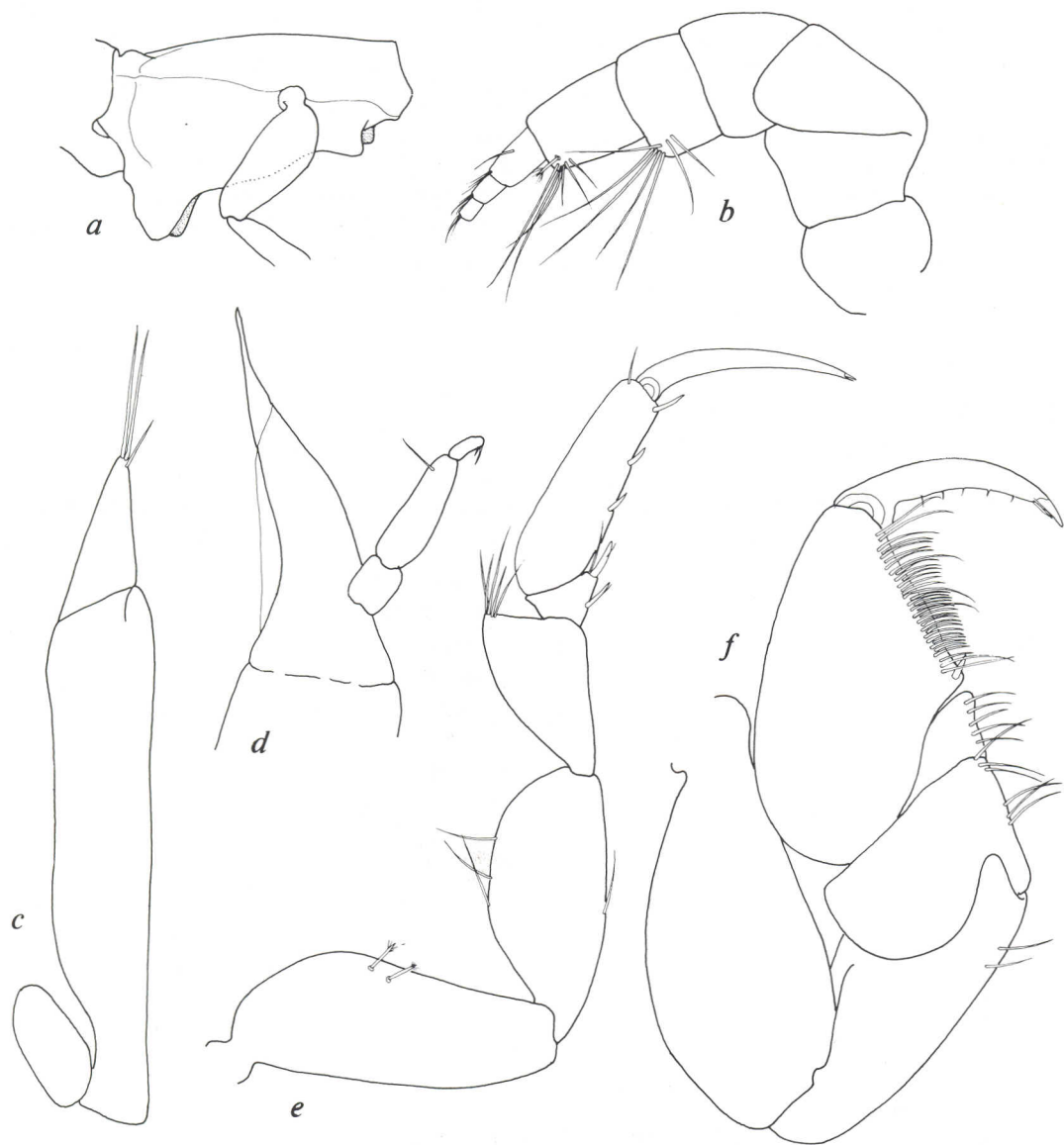


Fig. 17. *Leptanthura truncata*, syntype, pre σ : a, pereonite 5 in lateral view; b, antenna; c, maxilliped; d, mandible; e, pereopod 7; f, pereopod 1.

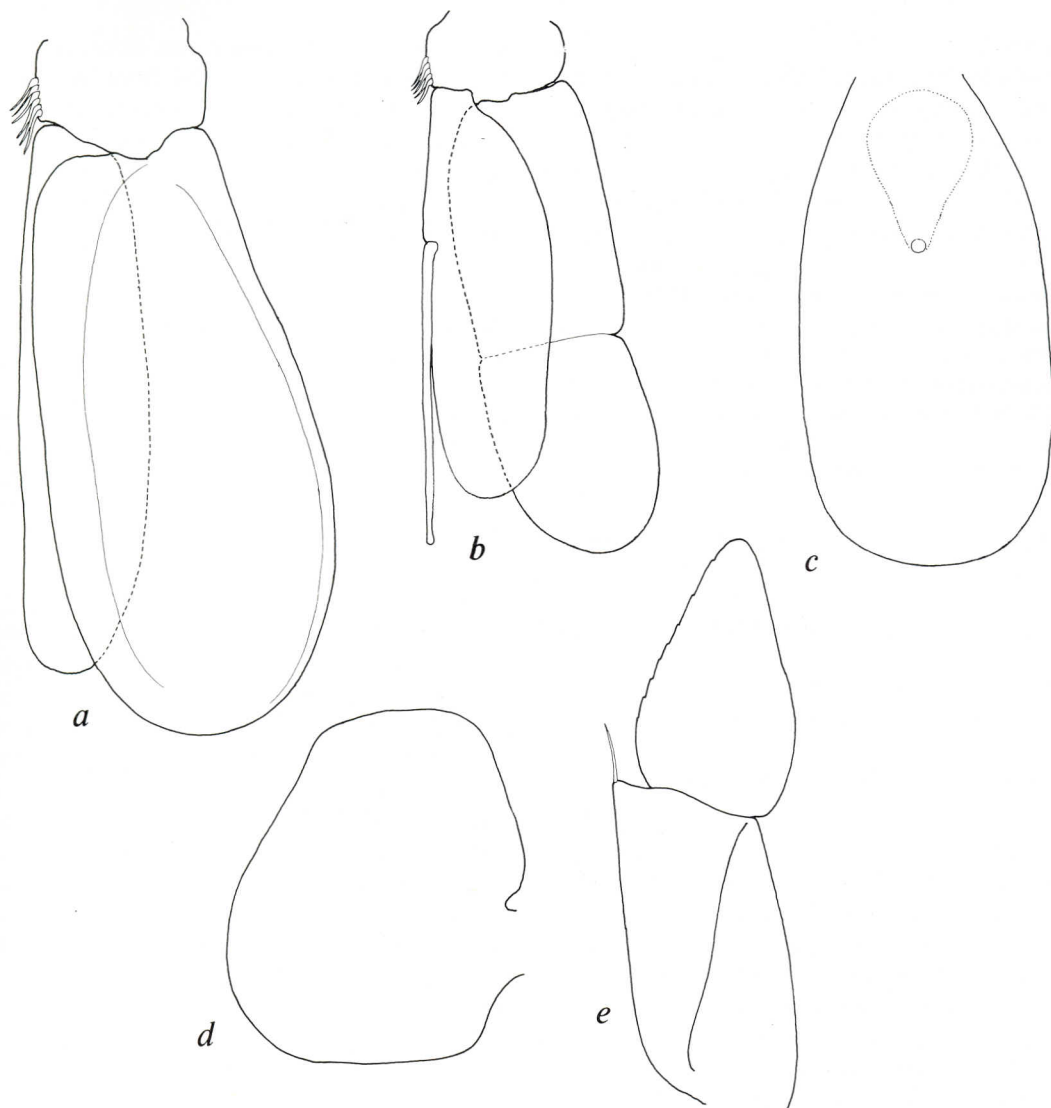


Fig. 18. *Leptanthura truncata*, syntype, pre σ : a, pleopod 1; b, pleopod 2; c, telson; d, uropodal exopod; e, uropodal endopod and basis. (Setae omitted from all appendages)

Remarks

Barnard (1925: 151) mentions that more material of this species is needed to "elucidate its true position." This remains true; the species still lacks a good diagnosis and description.

Leptanthura diemenensis (Haswell, 1884)

Leptanthura diemenensis: Barnard 1925: 151; Poore 1978: figs. 1-3.

Remarks

Poore (1978) has redescribed and figured this common Australian species.

Calathura brachiata (Stimpson, 1853)

Calathura brachiata: Barnard 1925: 152, pl. 4, fig. 19; Kusakin 1982: 46, figs. 27-30.

Remarks

Kussakin (1982) has redescribed and figured this boreal species. Wägele (1981a) figured material from the North Sea and from the Bay of Fundy, under the name *C. brachiata*, but the possibility exists that two species are involved here (G. Poore, pers. comm.).

***Paranthura nigropunctata* (Lucas, 1849)**

Paranthura nigropunctata: Barnard 1925: 153; Wägele 1982b: 110, figs. 1-6.

Material examined: ZMUC, 1 non-ovig. ♀ 8.0 mm, Siracusa, Sicily, Mediterranean Sea, 2-16 m, leg. H. J. Hansen. 3 ovig. ♀ 9.2-11.1 mm, 3 non-ovig. ♀ 8.7-11.0 mm, 5 juvs., Messina, Sicily, Mediterranean Sea, leg. H. J. Hansen.

Remarks

Wägele (1982) has redescribed all the stages of this species.

***Paranthura costana* Bate and Westwood, 1868 (*Paranthura* sp.)**

Fig. 19

Paranthura costana: Barnard 1925: 153; Wägele 1982b: 118, figs. 7-14.

Material examined: ZMUC, 1 ♂ 10.0 mm, »Corneliussen«.

Remarks

Barnard (1925) records this species from the Mediterranean, North Africa, Canary Islands, and the English Channel, and mentions examining males, females and young of both this species and *P. nigropunctata*. *Paranthura costana* has been redescribed by Wägele (1982b). The specimen mentioned above, with little collection data, and bearing Barnard's labels, is not *P. costana*. The shape and armament of the pereopods differ markedly from Wägele's figures, while the antenna 1 has 9 articles in the flagellum, rather than 7 as given by Wägele for a 4 mm male. Without more material of both sexes it would be difficult to give a specific name to this specimen.

***Paranthura punctata* (Stimpson, 1855)**

Paranthura punctata: Barnard 1925: 154; Poore 1980: 64; 1984a: 34; Kensley 1982a: 187, figs. 59-60.

Remarks

Kensley (1982a) rediagnosed and figured this

common South African species. Poore (1984a) has shown that the material from Australia recorded by Barnard (1925) belongs to two other species, viz. *P. caesia* Poore (from Tasmania) and *P. microtis* Poore (from South Australia). The identity of the material from New Zealand mentioned by Barnard (1925) remains to be elucidated.

***Paranthura lifuensis* Stebbing, 1900 (*Colanthura* sp.)**

Fig. 20

Paranthura lifuensis: Barnard 1925: 154, non Stebbing, 1900. Material examined: ZMUC, 1 ovig. ♀ 5.0 mm, Korean Straits, 33°10'N, 129°18'E, 80 m, 7 September 1897. 1 ovig. ♀ (telson missing), 32°12'N, 128°15'E, 160 m, 20 October 1897.

Diagnosis

Eyes of 11 or 12 ommatidia each. Pereopod 1, propodal palm with faintly convex flange, few short submarginal setae, and row of 10 spines proximal to palm. Pereopods 2 and 3 subchelate, propodi not as expanded as in pereopod 1, palm bearing 6 stout spines. Pereopods 4-6, unguis one-third length of dactylus, propodi rectangular, with serrate posterodistal spine, 2 spines on posterior margin; carpi roughly rectangular, with 2 posterior spines. Uropodal rami fringed with fairly dense setae; exopod broadly oval, with faint sinuosity in outer margin; endopod subcircular. Telson elongate-ellipsoid, broadly rounded posterior margin bearing few short setae.

Remarks

Barnard (1925) admits not to having seen the type of *P. lifuensis* Stebbing, but felt that the form of the tailfan was sufficiently similar to identify the present material with that species. He apparently missed the significance of the very short pereonite 7 and the absence of the seventh pair of pereopods.

Poore (1984b) rediagnosed *Colanthura* and three related genera, and mentioned six species. These are all very similar in overall form, and differ in details such as the number of spines in the propodal row of pereopod 1.



Fig. 19. *Paranthura* sp., ♂: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pereopod 7.

The present material bears some resemblance to *C. nigra* Nunomura, 1975, from Japan, but has fewer spines in the propodal row (10 as against 13). As the two ovigerous females are insufficient to diagnose fully this species, no name is provided.

***Paranthura flagellata* (Chilton, 1882)**

Paranthura flagellata: Barnard 1925: 155; Poore 1984a 45.

Remarks

Barnard (1925) expressed the opinion that *P. flagellata* from New Zealand was synonymous



Fig. 20. *Colanthura* sp., ovig. ♀: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, uropodal exopod (marginal setae omitted); e, uropodal endopod and basis (marginal setae omitted); f, telson; g, pereopod 7.

with *P. ciliata* Whitelegge, 1901, from New South Wales, although he did mention that the uropodal exopod was broader in the Australian species. Poore (1984a) has redescribed *P. ciliata* and states that it differs from *P. flagellata* in the shape of the telson.

***Paranthura infundibulata* Richardson, 1902**

Paranthura infundibulata: Barnard 1925: 155.

Material examined: ZMUC, pre ♂ 7.1 mm, St Thomas, U.S. Virgin Islands, 1 October 1917, leg. C. Løfving.

Remarks

As Barnard (1925) noted, the Copenhagen specimen is a premale, with the unmistakable truncate telson and uropods of this species.

***Paranthura porteri* (Bonne, 1920)**

Figs. 21, 22

Paranthura porteri: Barnard 1925: 155; Poore 1980: 64.

Material examined: USNM 50411, holotype, ♂ 12.3 mm, USNM 50412, paratypes, ovig. ♀ 10.4 mm, 2 premales 9.9–10.9 mm, Pisagua, Chile, June 1912, leg. C. E. Porter.

Description

Male: Integument, especially of tailfan, moderately indurate. Proportions: $C < 1 = 2 > 3 < 4 = 5 > 6 > 7$. Anterolateral lobes of cephalon containing eyes, extending beyond small triangular rostrum. Pleonites 1–6 together equal to pereonite 7 in middorsal length. Pleonites short, clearly articulated dorsally; pleonite 6 with small middorsal notch in posterior margin. Telson dorsally concave, bearing numerous fine cotton-like setae, with midventral rounded longitudinal ridge, posteriorly truncate, lateral margins faintly sinuate.

Antennule subequal in length to antenna; flagellum of 10 aesthetasc-bearing articles. Antenna, article 2 of peduncle longest, notched; flagellum of single flattened article, shorter than peduncle article 5, with 8 clumps of setae. Mandibular palp, article 2 three times length of article 1; article 3 bearing 15 spines in row. Maxilla with 10 faint distal serrations. Maxilliped with endite indicated by barely perceptible triangular lobe; palp of single slender triangular article bearing setae on mesial margin and apex.

Pereopod 1, propodus expanded, larger than pereopods 2 and 3, palm with convex striate flange, with dense irregular band of setae submarginally, with short rounded proximal lobe. Pereopods 2 and 3 similar, propodi with 8 sensory spines on posterior margin; carpus rectangular, with 4 sensory spines on posterior margin. Pleopod 1, exopod operculiform, indurate, with submarginal strengthening ridges along mesial and lateral margins; endopod basally broadened, distally narrowed, about 3/4 length of, and 1/8 width of exopod. Pleopod 2, rami subequal in length, endopod with copulatory stylet articulating proximally, stylet just reaching beyond ramus, distally slightly flared. Uropodal exopod elongate-rectangular, distal margin truncate to slightly concave, faintly dentate; endopod just less than 1/2 length of basis, distally broadly rounded, margins faintly dentate, just reaching beyond telsonic apex. Dorsal surface of uropods (as in telson) bearing dense fine cotton-like setae.

Ovigerous female: Similar to male in proportions and most appendages. Antennular flagellum of 9 articles, subequal in length to peduncle. Eyes not as large as in male. Marsupium formed by 4 pairs of oostegites. Pereopod 1, propodus with row of submarginal setae, but not as dense as in male. Tailfan lacking fine dorsal tangled setae seen in male.

Remarks

Boone (1920) created the genus *Calamura* for this species. Barnard (1925) stated the species to be a typical *Paranthura*, and indeed, the species agrees with all the points of Poore's (1980, 1984a) definitions of the genus. The only possible exception lies in the antennular flagellum. In *P. porteri* this has nine articles in the female, ten in the male. Poore (1984: 36) described the flagellum as never having more than ten articles.

Paranthura porteri, along with *P. bellicauda* Miller and Menzies from Hawaii, and *P. infundibulata* Richardson from Bermuda and the Caribbean, seem to form a group within *Paranthura*. All three species are characterized by the possession of an extremely shortened pleon, and

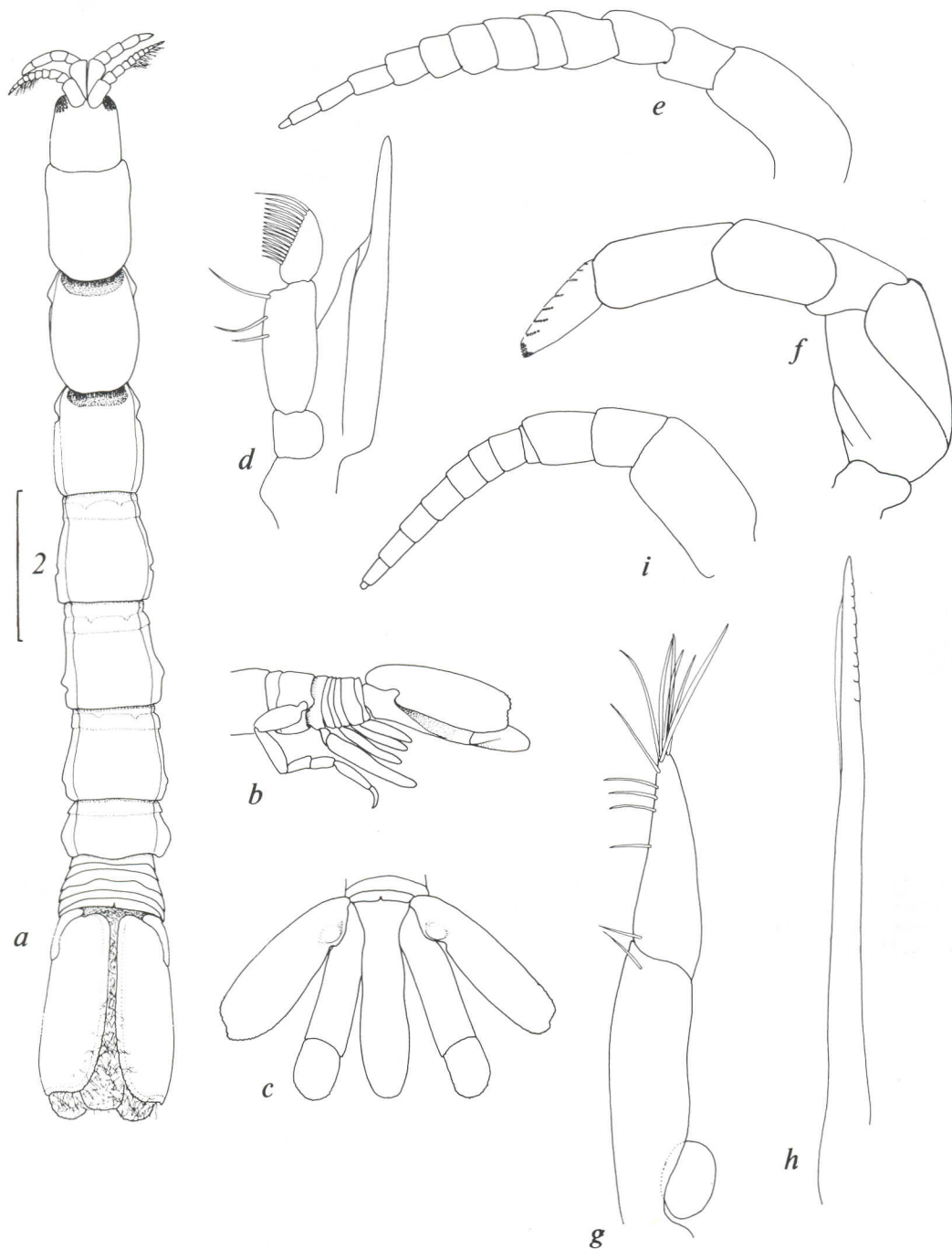


Fig. 21. *Paranthura porteri*, holotype, ♂: a, whole animal in dorsal view; b, pleon in lateral view (setae omitted); c, tailfan in dorsal view, uropods expanded (setae omitted); d, mandible; e, antennule; f, antenna; g, maxilliped; h, maxilla. Paratype. ovig. ♀: i, antennule. Habitus scale 2 mm.

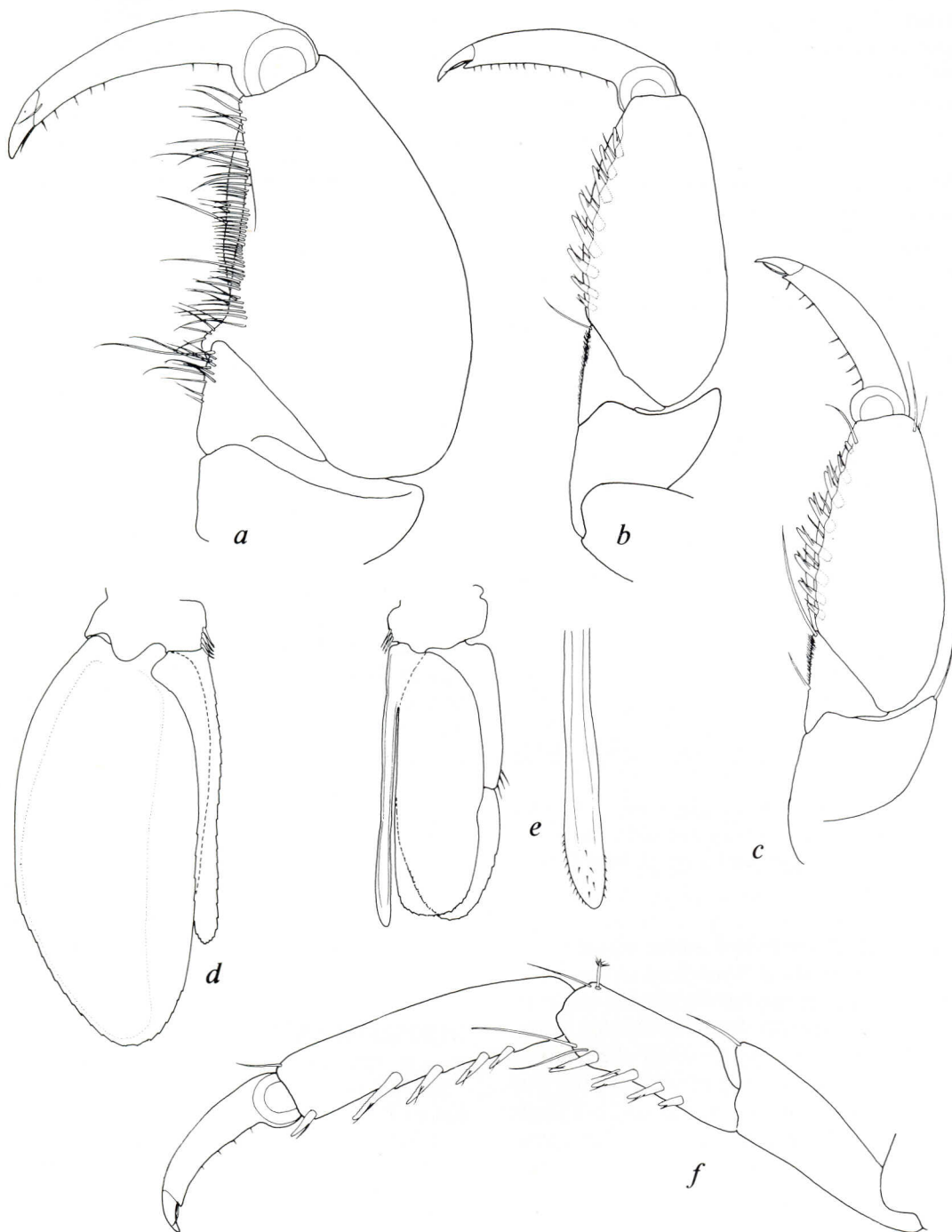


Fig. 22. *Paranthura porteri*, holotype, ♂: a, pereopod 1; b, pereopod 2; c, pereopod 3; d, pleopod 1 (marginal setae omitted); e, pleopod 2 (marginal setae omitted), with apex of copulatory stylet enlarged; f, pereopod 7.

broad, elongate, and marginally dentate or serrate uropodal exopods and truncate telsons. *Paranthura infundibulata* and *P. porteri* also share the feature of extremely setose dorsal surfaces of the tailfan of the male.

***Paranthura neglecta* Beddard, 1886**

Paranthura neglecta: Barnard 1925: 156.

Remarks

Barnard (1925) notes that he was unable to examine fully the holotype of this species, as it was whole-mounted on its side. The species has not been recorded since, and obviously requires redescription.

***Paranthura* (?) *involuta* Whitelegge, 1901**

(*Paranthura involuta* Whitelegge, 1901)

Paranthura (?) *involuta*: Barnard 1925: 156.

Paranthura involuta: Poore 1984: 53, fig. 15.

Remarks

Poore (1984a) has redescribed and figured this Australian species.

***Paranthura* (?) *antillensis* Barnard, 1925**

(*Paranthura antillensis* Barnard, 1925)

Paranthura (?) *antillensis* Barnard, 1925: 156.

Paranthura antillensis: Poore, 1980: 63.

Paranthura caribbiensis Kensley, 1982c: 348, figs. 161, 162. NEW SYNONYM.

Material examined: ZMUC, syntypes, 1 ovig. ♀ 4.1 mm, 6 non-ovig. ♀ (one with telson missing) 3.8-5.1 mm, St John and St James, U.S. Virgin Islands, 32 m, 16 March 1906, leg. T. Mortensen.

Remarks

Barnard (1925) indicated some reluctance in placing this species in *Paranthura*, as the flagellum of both antennae were reduced to single articles. In fact, (as was shown by Kensley, 1982c, who described this species under the name *P. caribbiensis*) the flagellum of antenna 1 has four short articles, while that of antenna 2 is a single article. No differences could be found in a comparison between the syntypes and the *P. caribbiensis* material from Belize.

***Cruregens fontanus* Chilton, 1882**

Cruregens fontanus: Barnard 1925: 157; Wägele 1982c: 52, figs. 4-7; Poore, 1984b: 713, fig. 7 c.

Remarks

This hypogean species from New Zealand has been well redescribed by Wägele (1982c) and Poore (1984b).

***Pseudanthura lateralis* Richardson, 1911**

Pseudanthura lateralis: Barnard 1925: 157; Kensley 1978c: 229, figs. 5, 6; 1982a: 192, figs. 61, 62.

Remarks

This deepwater species has been redescribed by Kensley (1978c, 1982a).

***Colanthura tenuis* Richardson, 1902**

Colanthura tenuis: Barnard 1925: 158; Poore 1980: 61; 1984b: 708, fig. 6a.

Remarks

Poore (1984b) rediagnosed the genus and redescribed this species.

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APPENDIX

Virganthura, gen. nov.

Diagnosis.

Eyes present. Antennular flagellum of 3 articles. Antennal flagellum of 7 articles. Mandibular palp of 3 articles. Maxillipedal palp of 3 articles; endite reaching to base of palp article 2. Pereopods 1-3 subchelate, pereopod larger than pereopods 2 and 3. Pereopods 4-7, carpi roughly

quadrate, with free anterior margin only slightly shorter than posterior margin. Pleonites short, distinct. Pleopod 1, exopod operculiform. Telson thin, with single proximal statocyst. Uropodal sympod well developed; exopod ovate, outer margin sinuate; endopod broadly triangular.

Type Species: *Virganthura crassa* (Barnard, 1925), by present designation and monotypy. (No other species are at present known to belong to the genus *Virganthura*.)

Remarks

The generic position of Barnard's *Accalathura crassa* is problematic, but unquestionably it is not an *Accalathura*, as it has fewer than 10 articles in the flagella of both the antennule and antenna. Using Poore's key to the paranthurids (1980: 58), the quadrangular carpi of pereopods 4-7, the presence of eyes, pereopod 7, and mandibular palp, the free uropodal endo- and exopod, and the antennal flagellar articles being cylindrical, all take one to couplet 11. The species, however, is not an *Aenigmathura* as the maxillipedal palp has three rather than two articles, and pleonite 6 is not dorsally fused with the telson. Neither is it a *Calathura*, because of the presence of a telsonic statocyst. Further, neither of Wägele's new genera from New Zealand (1985: 366,371) has a quadrate carpus of pereopods 4-7. Were it not for the presence of eyes, and the possession of quadrate carpi on the posterior pereopods, this species would closely resemble *Leptanthura*, especially in the 3-articulate maxillipedal palp, the form of the anterior pereopods, and the telson with its large single statocyst.

Etymology.

The generic name is derived from »virgo«, referring to the Virgin Island, plus the frequently-used suffix »anthura«.

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