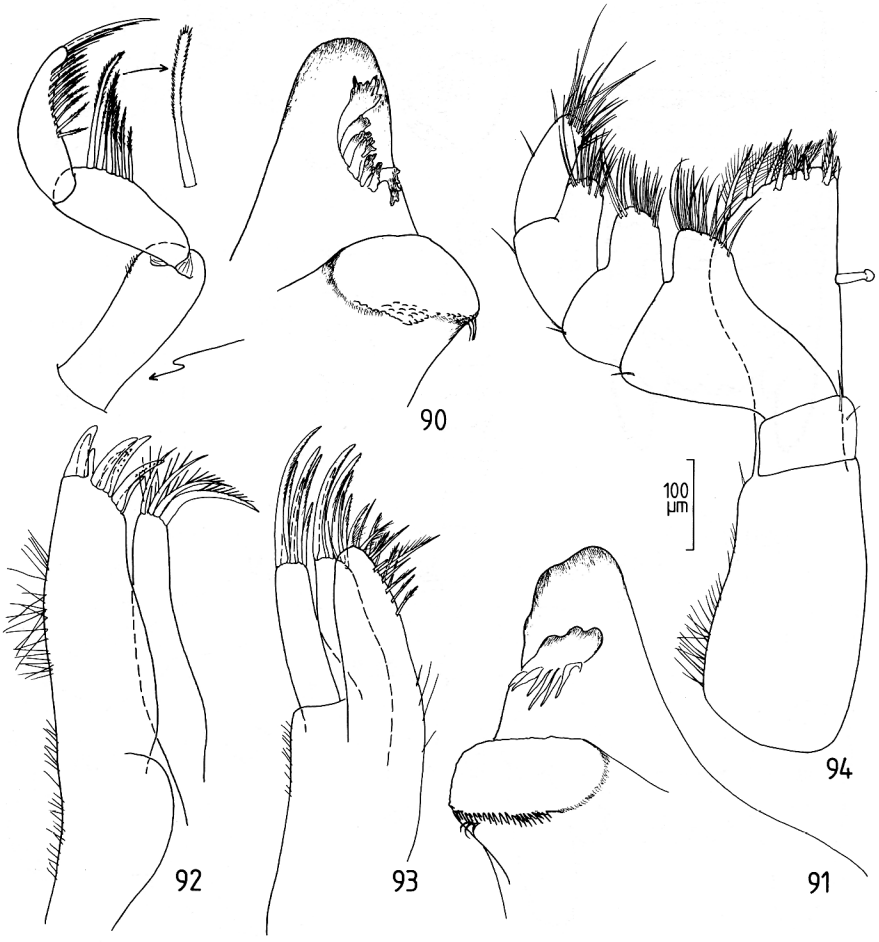
broad unicuspidate incisor and shallowly 3-cuspidate lacinia mobilis; spine row of 6 non-denticulate spines; triturative molar with row of denticles and 3 short setae along proximal margin. Narrow inner ramus of maxilla 1 bearing 4 distal, sparsely plumose spines; outer ramus with 8 distal, partly denticulate robust spines; moreover, outer margin of outer ramus bearing several setules. Maxilla 2, both inner and outer lobe of outer ramus bearing 6 slender, fringed spines; inner ramus slightly extending beyond outer lobes, bearing 15 mediodistal fringed setae. Endite of maxilliped with single coupling hook; endite somewhat widening in distal half, obliquely rounded distal margin bearing 12 plumose setae of different lengths; 5-articulate palp with robust, broadly rounded, mediodistal setose lobes on articles 2-4.

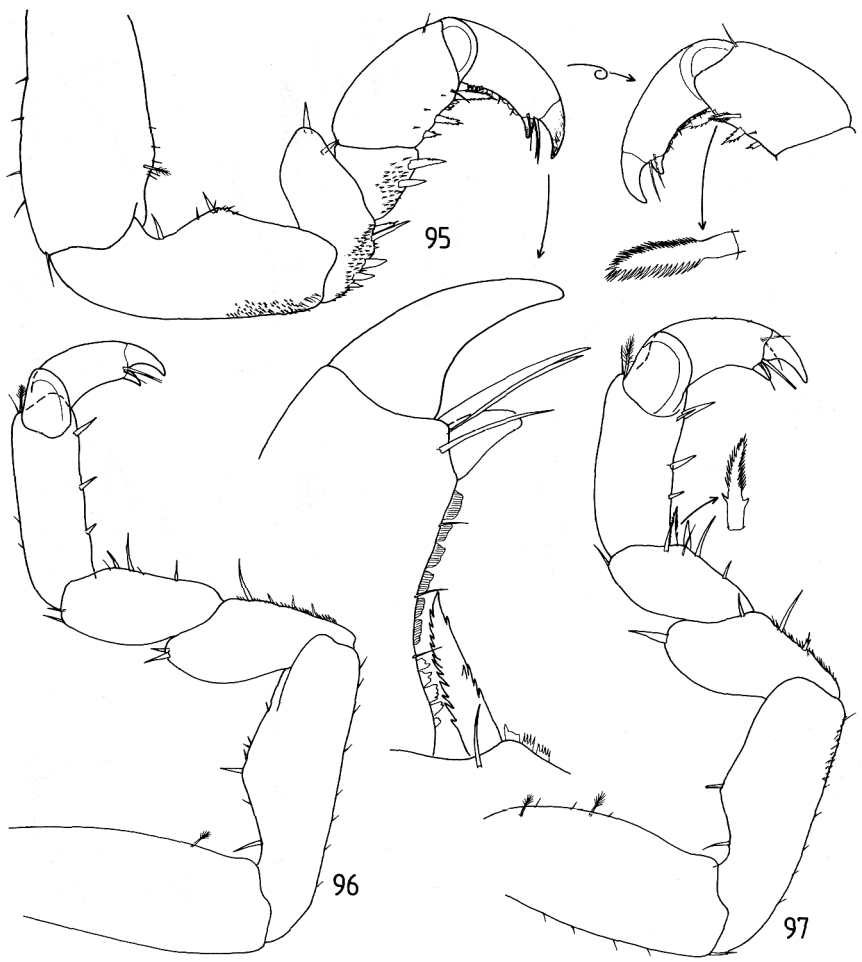
Pereopods barely setose, increasing in length posteriorly. Unguis of pereopod



Figs. 90-94. *Paracilicea watamuae* n. sp., ♂. 90, incisor, molar and palp of right mandible; 91, incisor and molar of left mandible; 92, maxilla 1; 93, maxilla 2; 94, maxilliped.

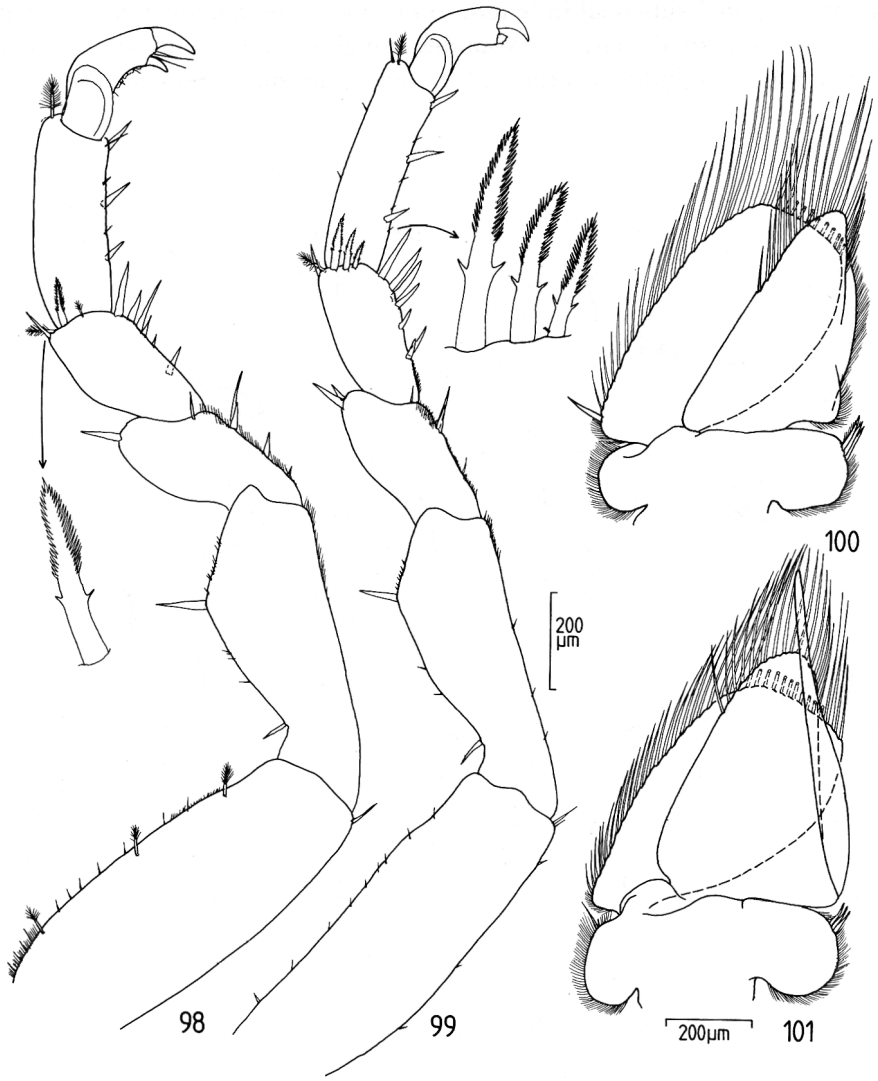
1 robust, 2/5 length of dactylus; mesial surface of propodus bearing densely fringed spine near posterior margin; posterior margin of propodus bearing row of 3, carpus 2 and merus row of 5 partly denticulate spines; carpus with very short, free anterior margin; posterior margin of carpus and merus, as well as posterodistal margin of ischium with many tiny denticulations; anterior margin of merus and ischium bearing few short, acute spines. Spination of pereopods 2-7 similar to that of pereopod 1; carpus of pereopod 7 with 11 spines of different shape along distal and posterior margin.

Sympodite of pleopods 1-2 with 3, of pleopod 3 with 2 retinacula. Endopodite of pleopod 1 subequal in length to exopodite, elongate-triangular, with slightly convex medial margin; exopodite roughly ovate, with almost blunt distal margin; endopodite bearing 22 plumose marginal setae in distal half,



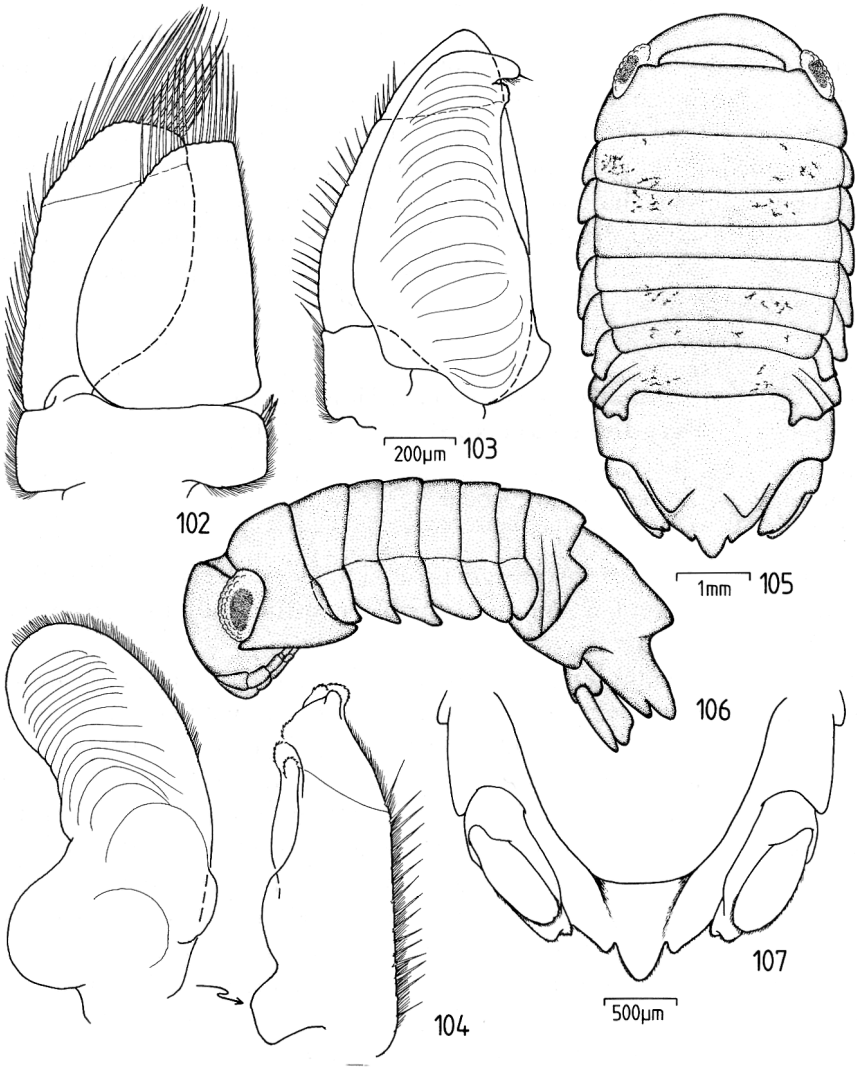
Figs. 95-97. *Paracilicea watamuae* n. sp., ♂. 95, pereopod 1; 96, pereopod 2; 97, pereopod 3.

exopodite 34 plumose marginal setae along outer and distal margin, as well as an acute spine at outer proximal margin. Triangular endopodite of 2nd pleopod slightly extending beyond exopodite, its distal margin narrowly rounded; proximally articulating appendix masculina slender, tapering to subacute apex, extending beyond distal margin of ramus with 1/4 of its length; distal part of endopodite bearing 17 plumose marginal setae; exopodite similar to that of first pleopod, outer and distal margin bearing 38 plumose setae. Endopodite of 3rd pleopod slightly shorter than exopodite; medial margin of



Figs. 98-101. *Paracilicea watamuae* n. sp., ♂. 98, pereopod 6; 99, pereopod 7; 100, pleopod 1; 101, pleopod 2.

endopodite almost straight, distal margin bearing 15 plumose setae; ovate exopodite with oblique suture in distal third, outer and distal margin bearing 37 plumose setae. Both endopodites of pleopods 4 and 5 pleated. Endopodite of 4th pleopod with short tooth-shaped medioproximal lobe; distal part of endopoditc medially directed and bilobate; triangular exopodite bearing 21 short plumose setae along outer margin, a transverse suture line present in distal third. Endopodite of pleopod 5 with broadly rounded medioproximal lobe, its outer distal margin densely setulose; exopodite with oblique suture in distal third, two mediodistal and three distal denticulate bosses; outer margin of



Figs. 102-107. *Paracilicea watamuae* n. sp. 102-104, ♂; 105-107♀. 102, pleopod 3; 103, pleopod 4; 104, pleopod 5; 105, dorsal view; 106, lateral view; 107, pleotelson and uropods, ventral view.

exopodite bearing 15 short plumose setae and many setules. Plumose marginal setae of pleopodal rami drawn as simple setae.

Uropodal rami relatively slender; endopodite fused with sympodite, 3/5 length of freely articulating exopodite; margins of both uropodal rami densely setulose.

♀: Total length 7.2 mm. Habitus similar to ♂, except for shape of pleotelson and uropods. Pleotelson with distal triangular projection and a narrow marginal notch on either side of it.

Uropodal endopodite slightly extending beyond short, freely articulating exopodite; endopodite with distinct distal notch.

Remarks: This species appears to be closely allied to the superficially described *Paracilicea eupyga* (Nobili, 1906) from the Gulf of Aden. The outline of its body is very similar to that of *P. watamuae* n. sp., but it is rather densely granulate and setose. Moreover, the dorsal surface of the pleotelson shows a pair of rounded dorsal projections and a small dorsodistal tubercle at midline. The distal pleotelsonic notches of *P. eupyga* are deeper than in the new species. Females are distinguishable through the distinctly longer mediodistal pleotelsonic tubercle of *P. watamuae* (cf. Nobili, 1906: 1-3, pl. 7 figs. 1-18).

Distribution: Kenya.

Paradella Harrison & Holdich, 1982
Paradella harrisoni n. sp. (figs. 108-136)

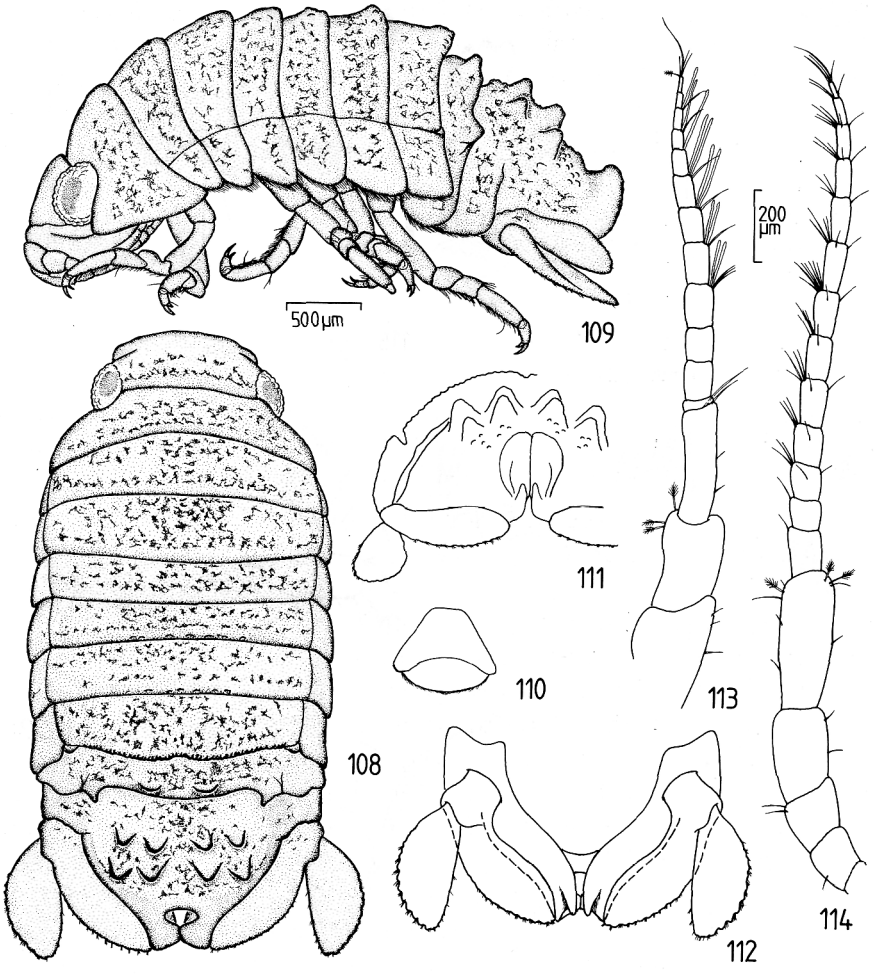
Holotype: ♂ (RMNH); from barnacles on reef-flat, intertidal; 4 August 1989. Paratypes: 7♂♂, 6♀♀ (1 ovigerous), deposited as follows. — 2 ♂♂, 2♀♀ (1 ovigerous) (HGM), 1♂, 1♀ (QM 18245), 4♂♂, 3♀♀ (RMNH); collected together with holotype.

Derivatio nominis: The species is dedicated to Dr. K. Harrison, The Natural History Museum, London, for his valuable contributions to Sphaeromatid taxonomy.

Description, ♂: Total length 4.1 mm, body covered with many brownish pigment spots and reticulations. Cephalon 3 times wider than long, anterior margin broadly rounded; laterally situated large eyes well pigmented. Pereonites subequal in length, sutures between coxae and pereonites 2-7 distinct; posterior margins of pereonites 5-7 vaulted, with granules which are markedly numerous on pereonite 7. Fused pleonite section shorter than pereonite 7, with pair of rounded tubercles in posterior half; a pair of suture lines merging posteriorly to one line of Y-shaped appearance. Pleotelson 1.8 times wider than long, dorsal surface with scattered granules and 8 prominent tubercles in 2 transverse rows of 4. Distal part of pleotelson expanded, with dorsal broad-ovate ventilation slit. Each side of ventral pleotelsonic margins with ridge extending to apex. These ridges not touching in midline and with deep distal notch. Epistome with blunt distal margin. Elongate penes fused at base, tapering to acute apex.

Antenna 1 with 3-articulate, barely setose peduncle; two proximal articles wider than 3rd article; flagellum 12-articulate; proximal article shortest and much wider than long; articles 4-7 bearing 2 distal aesthetascs, articles 8-10 with single aesthetasc. Antenna 2, peduncle 5-articulate, with 3 short, subequal proximal articles and 2 longer distal articlcs; 5th article 1.7 times length of 4th; flagellum of 13 setose articles.

Incisor of right mandible 4-cuspidate; lacinia mobilis lacking, spine row of 5 slender fringed spines; triturative molar with denticulate margins and 3 short marginal setae; palp large, extending beyond incisor, articles decreasing in length posteriorly; 2nd article with 7 fringed setae in distal half, terminal one with 12 fringed setae in distal two-thirds. Small inner ramus of maxilla 1 with 4



Figs. 108-114. *Paradella harrisoni* n. sp., ♂. 108, dorsal view; 109, lateral view; 110, clypeal region; 111, pleon, posterior view; 112, pleotelson and uropods, ventral view; 113, antenna 1; 114, antenna 2.

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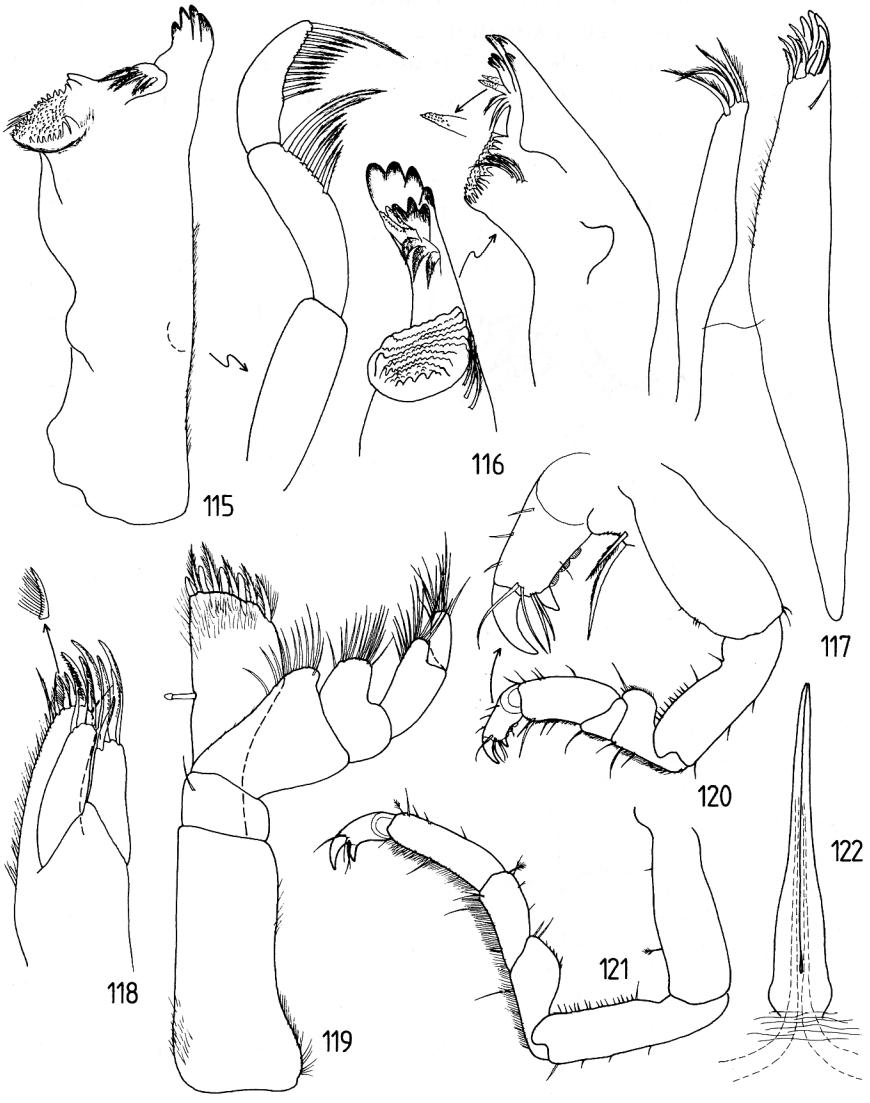
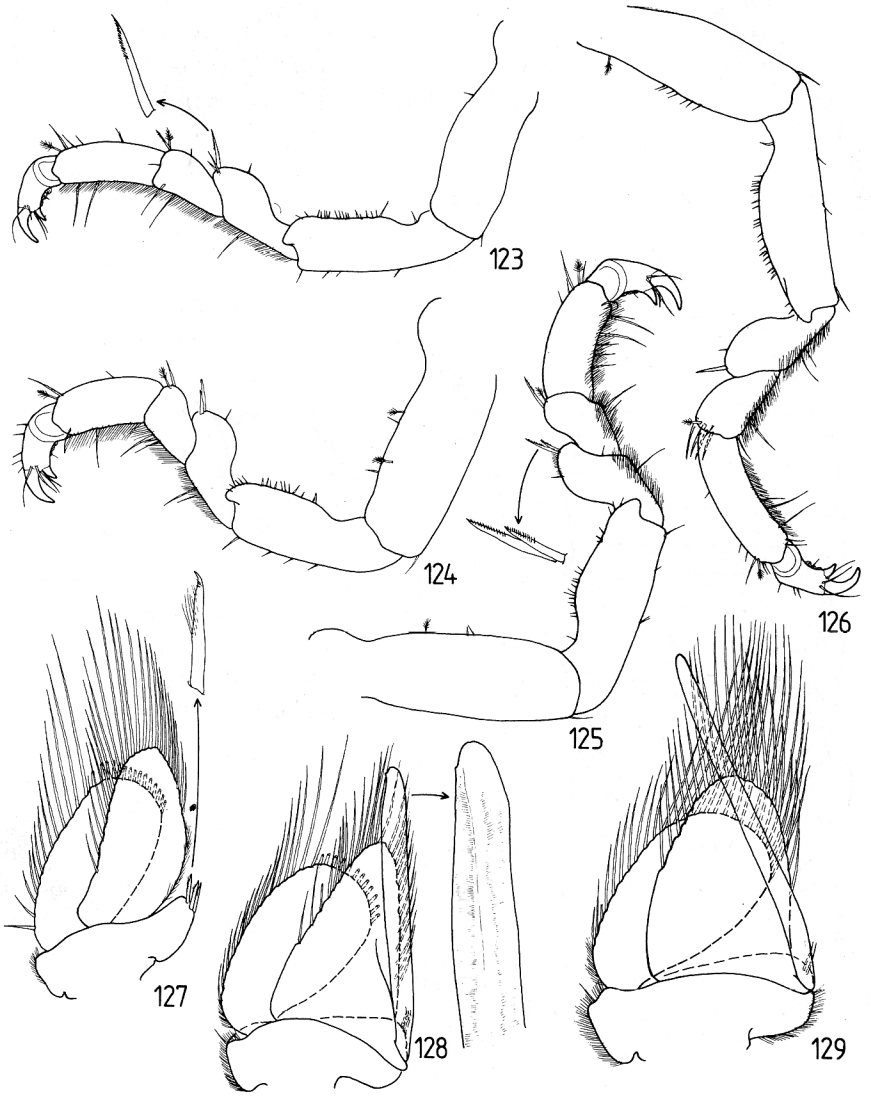
distal plumose setae; outer ramus bearing 11 distal, partly denticulate spines, a subapical seta and several setules along medial margin. Maxilla 2, both inner and outer lobe of outer ramus with 4 slender distal fringed spines; inner ramus slightly extending beyond outer lobe, rounded distal margin with 7 fringed spines; medial margin of inner ramus setulose. Endite of maxilliped with single coupling hook; distal part of endite widening, bearing several distal setules, 6 fringed spines and 4 apically rounded spines.



Figs. 115-122. *Paradella harrisoni* n. sp., ♂. 115, right mandible; 116, incisor and molar of left mandible; 117, maxilla 1; 118, maxilla 2; 119, maxilliped; 120, pereopod 1; 121, pereopod 2; 122, penes.

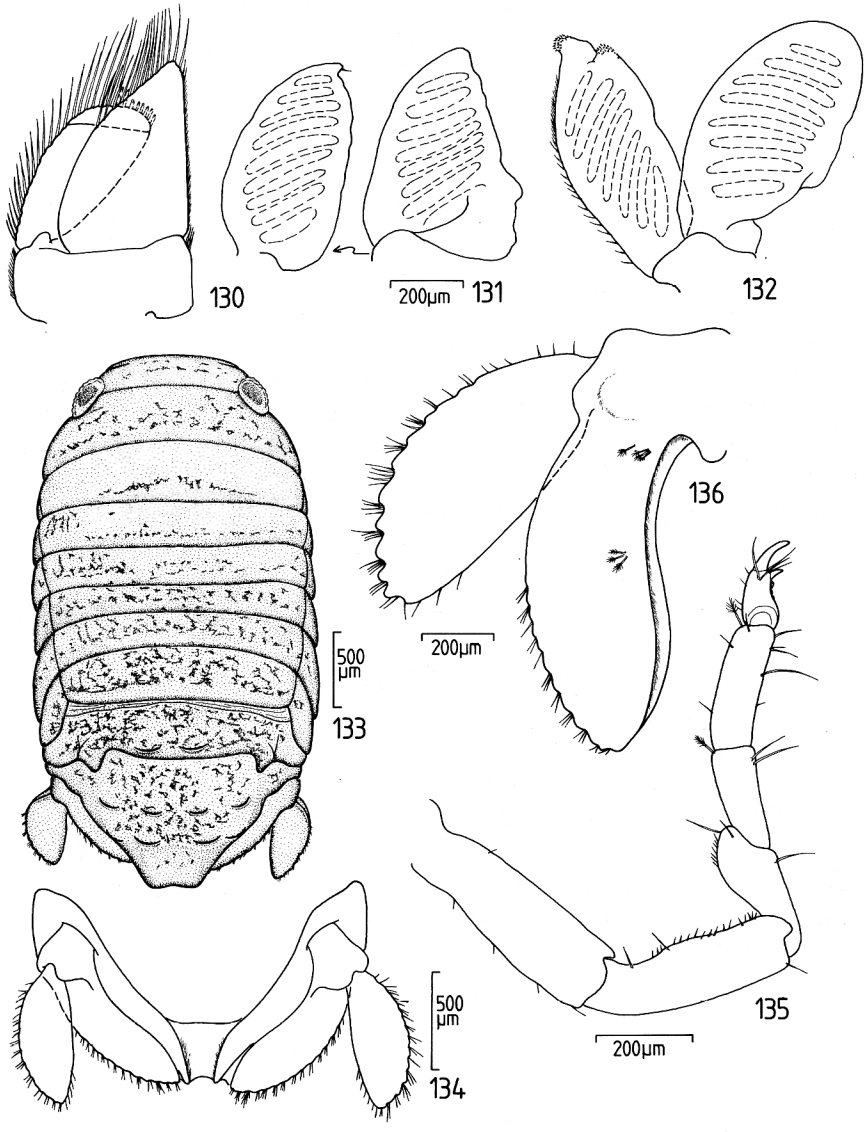
Pereopod 1 more robust than remaining pereopods, with very short carpus. Propodus, carpus and merus of all pereopods densely setulose and ischium with many spinules.

Sympodite of pleopods 1-3 with 3 retinacula. Rami of pleopod 1 roughly ovate in outline, endopodite well extending beyond exopodite; distal part of endopodite bearing 25 plumose marginal setae; outer and distal margin of exopodite bearing 26 plumose setae. Endopodite of 2nd pleopod triangular;



Figs. 123-128. *Paradella harrisoni* n. sp., ♂. 123, pereopod 3; 124, pereopod 4; 125, pereopod 6; 126, pereopod 7; 127, pleopod 1; 128, pleopod 2.
Fig. 129. *Paradella octaphymata* Harrison & Holdich, 1982, ♂, paratype (Queensland Museum, reference-number W 7926), pleopod 2.

proximally articulating appendix masculina with subapical denticle, extending beyond ramus with 1/4 of its length; distal part of endopodite with 26 plumose marginal setae; exopodite similar to that of pleopod 1, outer and distal margin bearing 28 plumose setae. Triangular endopodite of pleopod 3 well extending beyond exopodite, with straight medial and narrowly rounded distal margin; outer distal and distal margin bearing 14 plumose setae; elongate-ovate exop-



Figs. 130-136. *Paradella harrisoni* n. sp. 130-132, ♂; 133-136, ♀. 130, pleopod 3; 131, pleopod 4; 132, pleopod 5; 133, dorsal view; 134, pleotelson and uropods, ventral view; 135, pereopod 2; 136, left uropod, dorsal view.

odite with transverse suture in distal fourth, outer and distal margin bearing 28 plumose setae. Both rami of pleopods 4 and 5 pleated and subequal in length; endopodite of pleopod 4 wider than exopodite, exopodite bearing minute terminal seta; exopodite of pleopod 5 with 2 distal denticulate bosses and 14 short setae along outer proximal two-thirds. Plumose marginal setae of pleopodal rami drawn as simple setae.

Uropodal rami elongate-ovate; endopodite of uropod fused with sympodite, slightly longer than exopodite; both outer distal margins of uropodal rami with several rounded indentations bearing tufts of short setae; medial margin of endopodite with deep furrow over entire length that fits into the ventral pleotelsonic margin; dorsal surface of endopodite bearing 7 feathered sensory setae.

♀: Total length 3.5 mm. Similar in habitus to ♂, but posterior margins of pereonites without granules and dorsal surface of fused pleonite section and pleotelson with much shallower tubercles. Ventilation slit distally directed and distal pleotelsonic margin not so strongly expanded as in ♂. Ventral pleotelsonic margins without distal notch.

Pereopods less setose and setulose than in ♂.

Remarks: *Paradella octaphymata* Harrison & Holdich, 1982, from Australia is most closely allied to *P. harrisoni* n. sp. They are almost identical in their habitus, but can be distinguished by the following features:

The posterior margins of pereonites 5-7 in *P. octaphymata* are more strongly vaulted and granular than in the new species. The ventral pleotelsonic margin of the Australian species shows no distal notch. The most striking difference is in the shape of the second pleopod: the appendix masculina is considerably longer in *P. octaphymata* and the endopodite is distally wider, with a broadly rounded margin (fig. 129; Harrison & Holdich, 1982: 100, fig. 5). Another species with exactly the same arrangement of pleonal tubercles is *Paradella tuberculata* Müller, 1991, from Moorea, Society Islands. It is easily distinguishable from both *P. harrisoni* n. sp. and *P. octaphymata* by the shallower, apically more broadly rounded and granular tubercles on the pleon (Müller, 1991: 100, fig. 13A).

The new species has only been found associated with barnacles. This habitat is also mentioned at least for some of the samples available of the Australian *P. octaphymata.*

Distribution: Kenya.

CONCLUSIONS

Fifty percent of the shallow water Sphaeromatid genera of the Watamu area in Kenya are restricted to the Indo-Pacific area: the monotypic genus *Afrocerceis* n. gen. is known only from Kenya. The genus *Paracassidinopsis* with worldwide two species has been reported from the Western Indian Ocean and French

Polynesia. Several species have been assigned to the Indo-West Pacific genus *Paracilicea*, but few of them are described in some detail, viz., by Harrison & Holdich (1984), Kussakin, Malyutina & Rostomov (1990) and Monod (1975).

The other genera, *Dynamenella, Paradella* and *Sphaeromopsis* (the latter not reported on here; see Holdich & Jones, 1973) show a wide distributional range in the tropical and temperate areas of the Indo-Pacific and Western Atlantic.

In the present study with four new species from altogether six species it became obvious that the knowledge of the shallow water Sphaeromatidae along the East African shores is scanty. The scattered information on this family from nearby areas is inadequate and mainly based on superficial descriptions, which makes it impossible to discuss interspecific relationships in detail and to estimate certainly existing faunal provinces. On species level it can be seen that the Kenyan Sphaeromatid fauna overlaps with those of other areas with all three species already described: northward with Somalia (*Dynamenella scaptocephala, Sphaeromopsis amathitis*) and southward with Madagascar (*Paracassidinopsis perlata*), i.e. only the latter has been recorded outside the mainland of East Africa. The Sphaeromatidae from the mainland of Tanzania are unknown and there is no species in common with the Sphaeromatidae from Mozambique.

ACKNOWLEDGMENTS

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