59.53, 72 (67.5)

# Article V.—ISOPODS COLLECTED BY THE AMERICAN MUSEUM CONGO EXPEDITION[1]

By Willard G. Van Name

## INTRODUCTION

Twenty-one species, representing three of the primary subdivisions or superfamilies of the Isopoda, were collected by the Congo Expedition. Twelve of these species appear to be new to science. Of the total number, nine are marine or are confined to the immediate vicinity of the sea, one is a true fresh-water form, and the rest are terrestrial. Seven of the aquatic species collected are parasitic on fishes or on other Crustacea. This large proportion is, however, easily explained by the fact that the isopods were largely obtained incidentally to the collection of other animals and that the parasitic forms were thus more likely to be found than free-living ones equally or even more abundant.

While the collection is interesting on account of the comparatively little that is recorded concerning the Isopoda of the Congo region and on account of the new forms contained in it, it is by no means a representative one and the species it comprises cannot be more than a small percentage of those actually found there. Leaving out of account marine forms, which are generally of more or less wide distribution, many land isopods are known from other parts of tropical Africa, not too far distant from the Congo region to make it probable that they may eventually be found to range within its limits, especially as the comparative uniformity of wide stretches of country and the absence of mountain barriers in Africa is favorable to a wide distribution of such animals. No systematic collecting of Isopoda was done; nearly all the specimens were obtained and preserved by Mr. Herbert Lang himself, in intervals when his time and efforts were not occupied in obtaining or caring for more important material; but the fact that even under such conditions a larger collection was not brought back would seem to indicate that the Isopoda do not constitute a very large or conspicuous part of the fauna.

From an economic point of view, the importance of the isopods in the Congo region, as in most other parts of the world, is insignificant. The terrestrial forms are apparently not harmful either from their abundance or habits. The wood-boring aquatic species (*Sphæroma*) was

[1]Scientific Results of The American Museum Congo Expedition. General Invertebrate Zoology, No. 4.

found only in mangrove roots and was not reported as attacking the piling of wharves or bridges, as these animals do to a serious extent in some places. Those parasitic on market fishes are undoubtedly harmful to human interests; though they probably seldom kill the fish, except perhaps very young or weak individuals, they must be very troublesome to them, reducing them in flesh and food value. These parasites fortunately do not appear to be very abundant, as those collected were found only by examining a large number of fishes. If they were numerous, it would seem difficult to devise any way of combating such pests. As food for larger animals, birds, and fishes, the isopods doubtless play some part, but most of them would appear to contain little nourishment and many of the terrestrial species are probably quite unpalatable.

## Literature

Though the literature concerning the isopods of South Africa, East Africa, and some of the extreme western parts of the continent is rather extensive, the published records and notices referring to these animals in the Congo region are comparatively few. The more important of them are, for the most part, contained in or cited in the general monographs of Schiœdte and Meinert (1879–1884) and Hansen (1890); in the works of Stebbing (1908, 1910) on South African Crustacea, as far as the marine forms are concerned; and, for the land isopods, especially in the monographs and reports of the late Prof. G. Budde-Lund (see the bibliography at the end of this article). According to his published statements, Budde-Lund had prepared descriptions and drawings of many other previously unknown African species of land isopods, but the publication of these was prevented by his untimely death. A number of land isopods have been described from Togo Land by Hilgendorf (1893), from Assinie by Dollfus (1892), and from Liberia and Sierra Leone by Richardson (1908), but these have not, as far as I am aware, been found in the Congo region. The following are the species of isopods that I have found reported from this region, taking as limits the west coast of Africa from the latitude of Cape Verde to that of Cape Frio for the marine forms, and for the terrestrial forms the Congo basin and the colonies on the west coast from Cameroon to Portuguese West Africa inclusive.

## Marine Isopoda

*Ægа deshayesiana* (Milne-Edwards), 1840.

*Ægа deshayesiana* Schiœdte and Meinert, 1879, Naturhist. Tidsskr., (3) XII, p. 360, Pl. VIII, figs. 7–9.

*Rocinela deshayesiana* Studer, 1884, Abh. k. Akad. Wiss. Berlin, 1883, phys.-chem. Abt., Suppl., p. 22.

Azores and Cape Verde Islands; also Mediterranean.

*Ægа webbii* (Guérin), 1836.

*Ægа webbii* Schiœdte and Meinert, 1879, Naturhist. Tidsskr., (3) XII, p. 347, Pl. X, figs. 1–4.

Cape of Good Hope to Portugal.

*Cirolana cranchii* Leach, 1818.

*Cirolana swainsonii* Miers, 1881, Ann. Mag. Nat. Hist., (5) VIII, p. 370.

*Cirolana cranchii* Hansen, 1890, Danske Vidensk. Selsk. Skr., (6) V, p. 343, Pl. III, figs. 3–31.

Senegal (Gorée Island); a widely distributed species.

*Nerocila rhabdota* Kœlbel, 1879.[1]

*Nerocila rhabdota* Kœlbel, 1879, Sitzungsber. Akad. Wiss. Wien, (math.-nat. Kl.), LXXVIII (Abt. 1), p. 409, Pl. II, figs. 2*a*–2*c*.

*Nerocila rhabdota* Schiœdte and Meinert, 1881, Naturhist. Tidsskr., (3) XIII, p. 39, Pl. II, figs. 5, 6.

Senegal.

*Nerocila cephalotes* Schiœdte and Meinert, 1881.[1]

*Nerocila cephalotes* Schiœdte and Meinert, 1881, Naturhist. Tidsskr., (3) XIII, pp. 8, 9, 60, Pl. IV, figs. 16–18.

Senegal (Gorée Island); Gaboon; Cape of Good Hope.

*Anilocra capensis* Milne-Edwards, 1840.

*Anilocra capensis* Schiœdte and Meinert, 1881, Naturhist. Tidsskr., (3) XIII, p. 146, Pl. X, figs. 4, 5.

Teneriffe to Java.

*Glossobius linearis* (Dana), 1853.

*Glossobius linearis* Schiœdte and Meinert, 1883, Naturhist. Tidsskr., (3) XIII, p. 301, Pl. XII, figs. 1–9.

Widely distributed parasite of flying fishes; Cape Verde.

*Glossobius laticauda* (Milne-Edwards), 1840.

*Glossobius laticauda* Schiœdte and Meinert, 1883, Naturhist. Tidsskr., (3) XIII, p. 309, Pl. VII, figs. 10–16.

Widely distributed parasite of flying fishes; Cape Frio.

*Cymothoa plebeia* Schiœdte and Meinert, 1884.[1]

*Cymothoa plebeia* Schiœdte and Meinert, 1884, Naturhist. Tidsskr., (3) XIV, p. 236, Pl. IX, figs. 1, 2.

Cape Verde.

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[1] Collected also by the American Museum Congo Expedition.

## Terrestrial Isopoda

*Lìgyda gracilipes* (Budde-Lund), 1885.

*Ligia gracilipes* Budde-Lund, 1885, Crust. Isop. Terrestr., p. 270.

*Ligia gracilipes* Dollfus, 1878, Bull. Soc. Zool. France, XXIII, p. 126.

Portuguese Congo (Landana), Senegal.

*Eubelum stipulatum* Budde-Lund, 1899.[1]

*Eubelum stipulatum* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 71, Pl. I, figs. 1–16.

West Africa; Cameroon (Bonge).

*Eubelum lubricum* Budde-Lund, 1885.

*Eubelum lubricum* Budde-Lund, 1885, Crust. Isop. Terrestr., p. 292.

*Eubelum lubricum* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 72, Pl. II, figs. 1–1.

Portuguese Congo (Landana, Chinchoxo).

*Eubelum (Mesarmadillo) albicorne* Budde-Lund, 1899.

[*E.*] *Mesarmadillo albicornis* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 79, Pl. III, figs. 1–9.

Cameroon (N'dian).

*Eubelum (Mesarmadillo) quadrimaculatum*, Budde-Lund, 1899.

[*E.*] *Mesarmadillo quadrimaculatus* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 80, Pl. III, figs. 13–17.

Cameroon.

*Eubelum (Periscyphops) silvanum* Budde-Lund, 1899.

[*E.*] *Periscyphops silvanus* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 82, Pl. III, figs. 25–27.

Cameroon (Kitta, N'dian, Bibundi, Bonge).

*Eubelum (Periscyphops) bizonatum* Budde-Lund, 1899.

[*E.*] *Periscyphops bizonatus* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 84, Pl. III, figs. 18–24.

Cameroon (Kitta, Bibundi, Bonge).

*Eubelum (Periscyphops) gibbosum* Budde-Lund, 1899.

[*E.*] *Periscyphops gibbosus* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 85, Pl. V, figs. 23–25.

Cameroon (Bibundi).

*Eubelum (Periscyphops) squamatum* Budde-Lund, 1899.

[*E.*] *Periscyphops squamatus* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 86, Pl. V, figs. 1–6.

Cameroon (Bibundi).

*Eubelum (Periscyphops) squamosum* Budde-Lund, 1899.

[*E.*] *Periscyphops squamosus* Budde-Lund, 1899, Rev. Crust. Isop. Terrestr., Part I, p. 87, Pl. V, figs. 7–10.

Cameroon (Bibundi).

*Synarmadillo albinotatus* Budde-Lund, 1908.

*Synarmadillo albinotatus*, Budde-Lund, 1908, in Voeltzkow, Reise in Ostafrika, II, p. 277, Pl. XIII, fig. 47.

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[1]Collected also by the American Museum Congo Expedition.

*Synarmadillo cristifrons* (Hilgendorf), 1893.

*Periscyphis cristifrons* Hilgendorf, 1893, Sitzungsber. Gesell. nat. Freunde, Berlin, p. 152.

*Synarmadillo cristifrons* Budde-Lund, 1908, in Voeltzkow, Reise in Ostafrika, p. 277, Pl. XIII, fig. 48.

Cameroon (Kribi, Buea, Barombi Station).

*Synarmadillo globus* Budde-Lund, 1908.[1]

*Synarmadillo globus* Budde-Lund, 1908, in Voeltzkow, Reise in Ostafrika, III, p. 276, Pl. XIII, figs. 37–44.

Cameroon (Bibundi, Bonge).

*Cubaris (Diploexochus) aculeata* (Budde-Lund), 1885.

*Armadillo aculeatus* Budde-Lund, 1885, Crust. Isop. Terrestr., p. 289.

*Diploexochus aculeatus* Stebbing, 1910, Ann. South African Mus., VI, p. 446.

Portuguese Congo (Landana, Chinchoxo).

*Niambia squamata* (Budde-Lund), 1885.[1]

*Porcellio (Leptotrichus) squamatus*, Budde-Lund, 1885, Crust. Isop. Terrestr., p. 196.

*Niambia squamata* Budde-Lund, 1909, in Schultze, Reise in Südafrika, p. 60, Pl. VI, figs. 1–3.

Portuguese Congo (Landana, Chinchoxo).

*Rhyscotus globiceps* Budde-Lund, 1908.

*Rhyscotus globiceps*, Budde-Lund, 1908, in Voelzkow, Reise in Ostafrika, II, p. 301, Pl. XVII, figs. 41–45.

French Congo (Loango).

*Philoscia (Anchiphiloscia) cunningtoni* Stebbing, 1908.

*Anchiphiloscia cunningtoni* Stebbing, 1908, Proc. Zool. Soc. London, p. 557, Pl. XXVII, B.

North East Rhodesia (Niamkolo Bay, southern shore of Lake Tanganyika).

The following additional species are from localities but little beyond the above limits.

*Eubelum pila* Budde-Lund, 1898.

*Eubelum pila* Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 4.

Mt. Ruwenzori, on the western slope at 2600 m.

*Eubelum hilgendorfii* Budde-Lund, 1898.

*Eubelum hilgendorfii* Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 4, figs. 1, 2.

Mt. Ruwenzori, on the western slope at 2600–3100 m.

*Periscyphis nanus* Budde-Lund, 1898.

*Periscyphis nanus* Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 5, fig. 6.

Mt. Ruwenzori, on the western slope at 3100 m.

*Periscyphis pygmæus* Budde-Lund, 1898.

*Periscyphis pygmæus* Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 6, figs. 10, 11.

Mt. Ruwenzori, on the western slope at 3100 m.

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[1]Collected also by the American Museum Congo Expedition.

*Synarmadilloides roccatii* Nobili, 1906.

*Synarmadilloides roccatii* Nobili, 1906, Boll. Mus. Zool. Anat. Torino, XXI, No. 544, p. 2.

Eastern slope of Mt. Ruwenzori at 3000 m., Toro.

*Porcellio (Porcellionides) pruinosus* (Brandt), 1833.

*Metoponorthus pruinosus* Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 8.

Region of Mt. Ruwenzori. (This species is of almost world-wide distribution.)

*Philoscia maculicornis* Budde-Lund, 1898.

*Philoscia maculicornis* Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 9.

On the shore of Lake Albert, November 26, 1891. According to Stuhlmann's diary this locality is on the southwestern shore of the lake, in Belgian territory.

*Philoscia mendica* Budde-Lund, 1898.

*Philoscia mendica* Budde-Lund, 1898, Deutsch Ost-Afr., IV, Land-Isopoden, p. 9, figs. 14, 15.

Region of Mt. Ruwenzori.

## The Congo Expedition Collection

The following are the species comprised in the collection and described and figured in the present article.

### Superfamily Flabelloidea



### Superfamily Bopyroidea



### Superfamily Oniscoidea

APPROXIMATE LOCATION OF PLACES WHERE SPECIMENS WERE COLLECTED

Avakubi.—1° 20′ N., 27° 40′ E.
Banana.—6° S., 12° 20′ E.
Bengamisa.—1° N., 25° 10′ E.
Garamba.—4° 10′ N., 29° 40′ E.
Lubila R.—1° N., 26° 30′ E.
Malela.—6° S., 12° 40′ E.
Medje.—2° 25′ N., 27° 30′ E.
Poko.—3° 10′ N., 26° 50′ E.
St. Antonio.—6° 10′ S., 12° 20′ E.
Stanleyville.—0° 30′ N., 25° 15′ E.
Thysville.—5° 30′ S., 15° E.
Uele River.—3° 30′ N., 30° to 30° E.
Zambi.—6° S., 12° 50′ E.

The preponderance of parasitic forms among the aquatic species has been noted and an explanation offered. Naturally the majority of new species are among the terrestrial forms; no less than five of them, besides one previously described, belong to the typical subgenus of *Eubelum*, a large genus particularly characteristic of tropical Africa, its typical subgenus being confined to that region. An interesting and unexpected discovery is that of a species assignable to the genus *Ichthyoxenos*, a group parasitic on fresh-water fishes, hitherto known only from East Indian and Asiatic fresh waters. The fact that there is considerable resemblance between the isopod faunas of Africa and the West Indies and South America has been noted by previous writers (see Budde-Lund, 1893, p. 3), though, considering the ease with which such small creatures may be accidentally transported, it does not seem that too much significance should be ascribed to the similarity. The present collection, however, bears out this relationship in the case of the marine and littoral forms, three of which appear to belong to species found also on the American side, while three others have allies there separable only on very slight characters.

In concluding these preliminary remarks, I wish to express my thanks to the leader of the expedition, Mr. Herbert Lang, for his care in preserving and labeling the specimens and to him and Dr. J. Bequaert for information and corrections, particularly those relating to the geography of the region; also to Mr. Roy W. Miner of the American Museum for his help and encouragement in the work of preparing this article.

## DESCRIPTIONS OF SPECIES

When possible, and except when otherwise stated or clearly indicated from the nature of the characters under consideration, the descriptions and illustrations have been prepared from female specimens, even when the similarity of the two sexes made this apparently a matter of indifference. Any differences between the sexes that were

observed have been noted or illustrated. The specimens of the new species chiefly used in preparing the descriptions and drawings have been designated and catalogued as types, although in many cases they have been badly damaged by the continued handling and the dissection necessary in making out their characters. To prevent misunderstanding it may be well to state that in the case of previously described species the following descriptions and figures are based on Congo Expedition specimens exclusively, and not partly on the descriptions of other authors.

The small number of groups and species dealt with makes the classification adopted here a matter of minor importance. That a very conservative course in the recognition of families and genera has been followed is not due either to reactionary spirit or to any failure to recognize most of the divisions established by recent authors as natural groups, but to the belief that the splitting of genera and families has been carried to an extent that, by magnifying the importance of small differences, hinders the proper recognition of much more important points of resemblance and relationship, and that it has become the chief source of the instability and inconvenience of our present system of nomenclature. It has also often resulted in the necessity of defining the genera by such minute characters or complex and arbitrary combinations of characters that new species, or even some of the old ones, do not fit into them, and the alternative is presented of indefinitely multiplying the genera or of admitting exceptions and qualifications which break down the distinctness of the groups. It seems as if such considerations should lead us to accept the breaking up of well-established and natural groups with much caution, and to keep in mind that the mere fact that distinct sections within a group can be recognized, or that the group is a large one, are in themselves no reasons for its complete disintegration, with the result of usually compelling changes in the names of nearly all its members.

## Superfamily **CYMOTHOIDEA** (=Flabellifera)

### Cymothoidæ

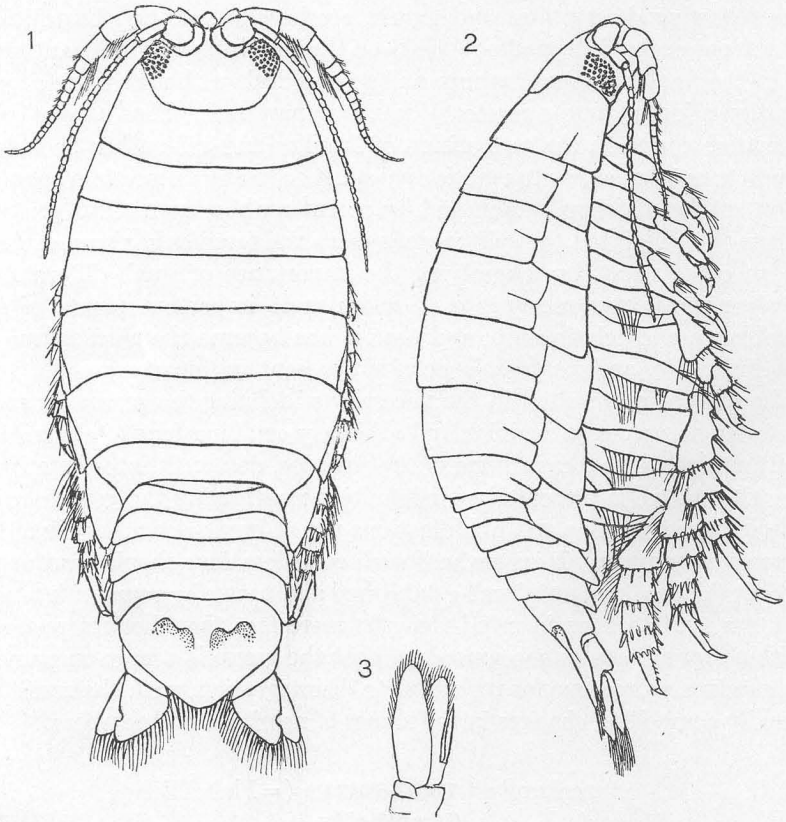
### **Eurydicinæ** (=Cirolanidæ *auct. mult.;* Eurydicidæ, Stebbing, 1905)

### **Eurydice carangis,** new species

Text Figures 1 to 5

Body, as seen from above, of elongate-oval outline, the widest part somewhat anterior to the middle. The abdomen is rather short and considerably narrower than the thorax, but the large epimera of the posterior thoracic segments fill in the general outline so that it is nearly continuous. Back strongly arched; its surface smooth. Length of largest specimens (to tip of abdomen) about 10 mm.; ratio of greatest width to length about 6 to 14.5.

Head narrow, and as seen from above deeply set back into the first thoracic segment; its anterior border produced at the middle into a short and narrow rostrum, each side of which the outline of the head is deeply concave to receive the broad, flattened, basal segments of the first antennæ that occupy nearly all the space between the rostrum and the fore part of the eyes. The latter are large and deeply pigmented, irregularly oblong, with about 50 ocelli. The rostrum joins, at its for-




Figs. 1 to 3. *Eurydice carangis*, new species.
1 and 2. Female, × 10.
3. Second pleopod of male, × 14.

ward extremity, the somewhat quadrate, enlarged end of the frontal lamina, that extends up from below and forms the most anterior part of the head. First antennæ very long, exceeding the second pair and reaching, when well drawn back, beyond the middle of the fourth thoracic segment. The first two segments of the peduncle are, as already stated, very wide and flattened; the first is so short that, as seen from above, it appears merely as a border to the second. The third segment is narrow,

elongate, and cylindrical, and bears at its distal end what appears to be a small vestigial fourth segment, incompletely united with the third. The flagellum is long and slender, having twenty-five to twenty-eight articles, of which the proximal one is usually much longer than any of the others. Second antennæ much stouter than the first, reaching, when well drawn back, to the posterior edge of the third thoracic segment; the peduncle has four segments, the first of which is composed of two short segments fused together; the flagellum is stout and tapering, with fifteen to eighteen articles. The clypeus ends in a free, triangular, downwardly and forwardly extending apex. The extended lobe of the second segment of the maxilliped bears a single hook.

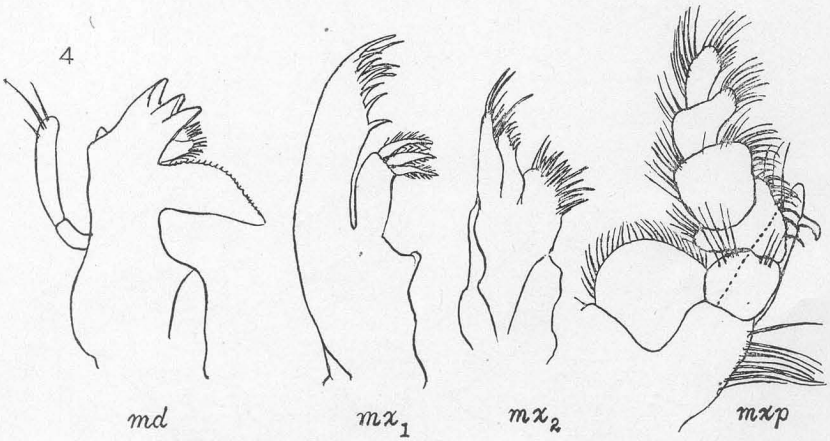



Fig. 4. *Eurydice carangis*, new species. Mouth-parts of female, × 40.

The first, fifth, and sixth thoracic segments are longer than the others; the epimera of all the thoracic segments are distinct and movably jointed to them except in the case of the first. Their external surface is smooth and without any furrow. The epimera end behind in an angle which is very slightly produced backward in the anterior segments but much more so in the posterior ones. The four last pairs of legs are provided with numerous spines and hairs.

The abdomen has six distinct segments; the first more or less covered by the last segment of the thorax, and the others successively longer. Only the fourth and fifth have the lateral angles produced and bent backwards. The terminal segment is triangular, but rounded off at the extreme apex. A conspicuous depression on its dorsal surface each side of the median line marks off a raised anterior border from the comparatively flat posterior part. There is no distinct median carina. The foliaceous parts of the pleopoda are rather elongate; the uropoda are short, with the terminal branches somewhat triangular and obliquely truncated. Their inner branch is wide and has a conspicuous notch on its outer border a little way from the end; the outer branch is both shorter and narrower. There are moderately long hairs on the inner and posterior margins of both branches of the uropoda and on the rounded part of the tip of the abdomen, but none on the outer margins of the branches of the uropoda.

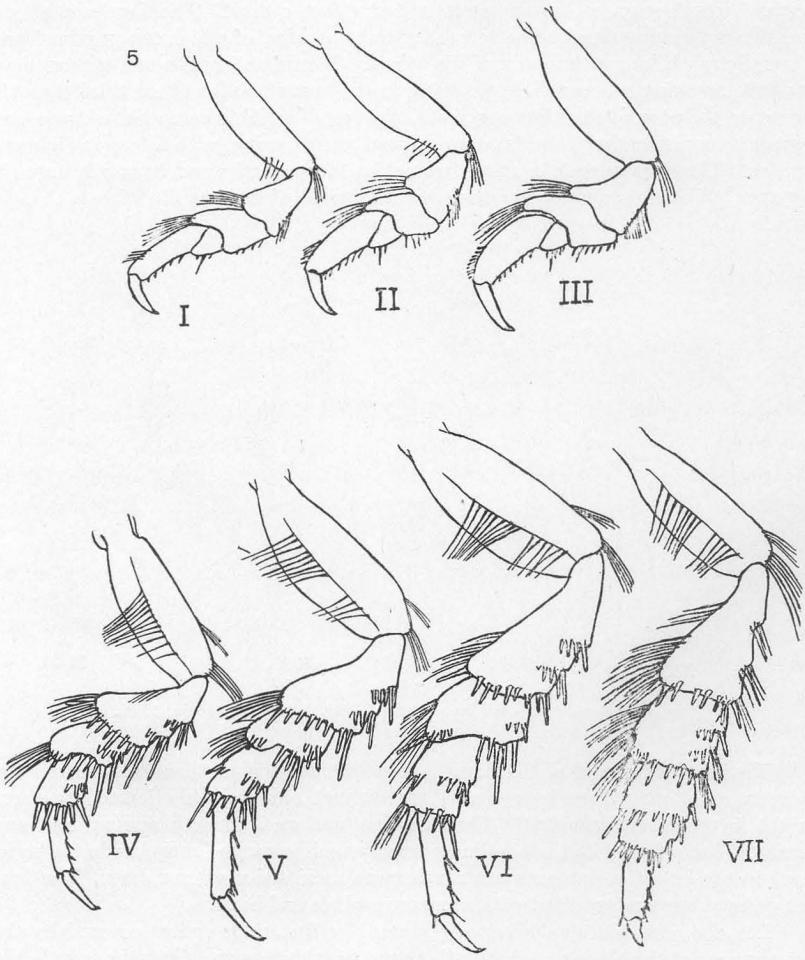



Fig. 5. *Eurydice carangis*, new species. Legs of right side of female, external aspect, × 16.

Color, in alcohol, yellowish with many small irregularly stellate or branching spots of black pigment on the upper parts.

The above description is from female specimens, but the sexual differences are not conspicuous. The males have the peduncular segments of the second antennæ averaging a little stouter than in the females. The process of the second pleopod of the male is straight and shaped like a knife blade, tapering to a point from near the middle of its length; it is shorter than the foliaceous branches of the appendage.

A majority of the numerous examples collected were obtained on fishes, *Caranx hippos* (Linné), brought to market at Banana and St. Antonio. Many of them are young individuals. Males predominate among the adults. The young differ little in general appearance from older examples except in size. The specimens in the collection are as follows:

Cat. No. 3250. St. Antonio, August 1915. 1 specimen. Type.
Cat. No. 3253. St. Antonio, August 1915. About 50 specimens. Cotypes.
Cat. No. 3255. Banana, July 1915. 4 specimens.
Cat. No. 3252. Banana, August 1915. About 40 specimens. "Taken from dead sea stars."

This species, remarkable for the great length of the first antennæ, is one of several that are intermediate in character between *Eurydice* Leach, 1815, and *Cirolana* Leach, 1818; the four-jointed peduncle of the second antennæ would place it in the former genus (the course adopted here), while the absence of a right-angled bend in the basal portion of the second antennæ and the presence of a hook on the extended second lobe of the maxilliped would place it in *Cirolana*. If placed in *Cirolana*, it would be a member of the subgenus *Excirolana* Richardson (1913, Proc. U. S. Nat. Mus., XLIII, p. 201). It is very closely related to *E. natalensis* (Vanhoeffen, 1914, p. 500, fig. 42) from Natal, but that form has shorter first antennæ and lacks the notch on the inner division of the uropoda. Such species as this render the distinction between the genera *Cirolana* and *Eurydice* difficult to maintain.

## **Cymothoinæ** (= Cymothoidæ *auct. mult.*)

### **Nerocila cephalotes** Schiœdte and Meinert

Text Figures 6 to 9

*Nerocila cephalotes*[1] Schiœdte and Meinert, 1881, Naturhist. Tidsskr., (3) XIII, pp. 8, 9, and 60, Pl. iv, figs. 16, 18. Stebbing, 1910, Ann. South African Mus., VI, p. 423. Barnard, 1914, Ann. South African Mus., X, p. 371.

The largest and apparently the oldest specimen of this species has adult female characters, including a brood pouch; it measures 24.5 mm. long by about 11.4 mm. wide. Body somewhat asymmetrical, widest at the junction of the sixth and seventh thoracic segments; back moderately convex, the surface very hard and smooth. Seven thoracic and six abdominal segments distinct and separate.

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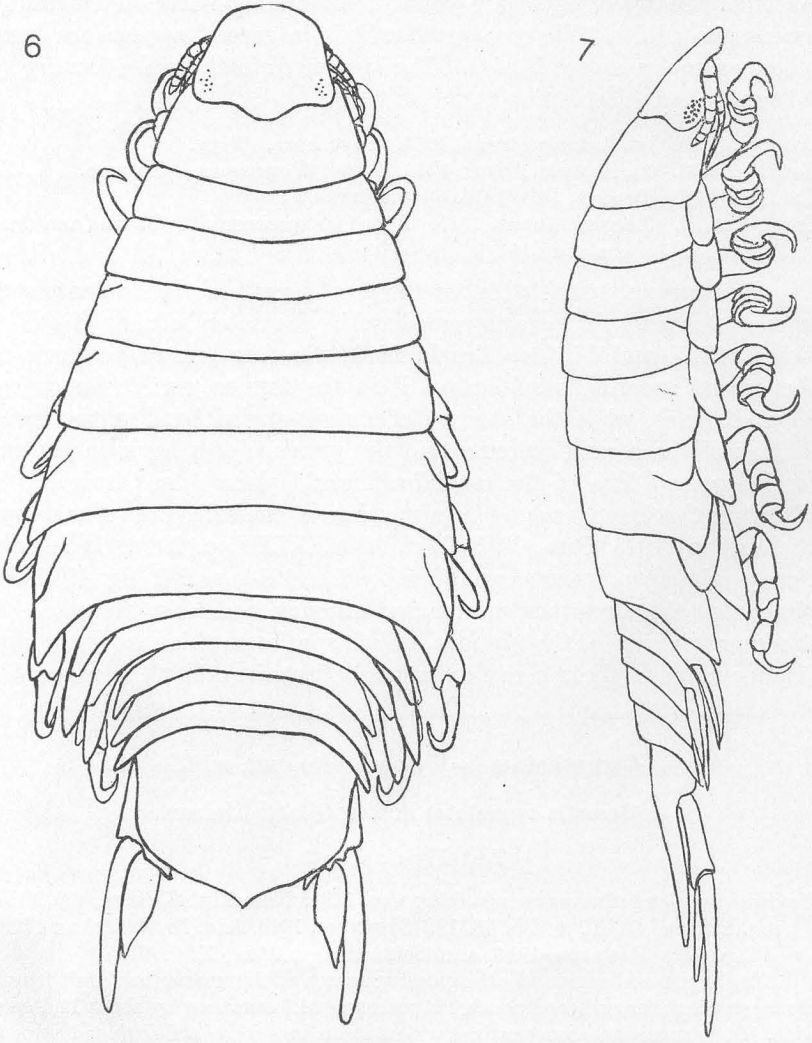
[1]The original description (*loc. cit.*, p. 60) is headed *N. cepholotes*, but this obvious misprint need be accorded no standing in nomenclature, as in the key and introductory remarks on preceding pages (pp. 8 and 9) where some of the characters of this species are also given, the name is correctly spelled *cephalotes*, as also in all other parts of the work except p. 60.




Figs. 6 and 7. *Nerocila cephalotes* Schiœdte and Meinert, 1881.
6. Female, × 5.
7. Female, side view of slightly younger individual, × 5.

Head small, gently convex in front and three-lobed behind; eyes rudimentary, being reduced to irregular pigmented areas with very imperfect lenses; first antennæ with eight, the second with ten segments, inclusive of the peduncular ones (some other specimens have eleven segments).

The first, fifth, sixth, and seventh thoracic segments are the longest; the second, third, and fourth are short. The posterior lateral angles of the first are very slightly produced backward and rounded off; those of the sixth and seventh are considerably produced and of angular form. The intermediate ones are not produced at all. The above refers to the main part of the segments, not to the epimera. The epimera of all but the first are distinctly separated from the segment; those of the second and third segments are rounded off behind; the following ones are successively more and more pointed. The legs have strong hooked claws; the last pair of legs, though long, are slenderer than the others and have weaker claws.

The abdominal segments, except the last, are short; the first and second have their lateral ends extended backward into long sharply pointed processes. The terminal segment of the abdomen is very broad; it is shield-shaped, and ends in a small, median triangular projection. It is nearly flat with only a slightly thickened anterior margin and a slight suggestion of a median ridge. The outer ramus of the uropoda may be described as broadly saber-shaped; it is slightly curved and about equal to the last segment of the abdomen in actual length, but from its position it extends beyond the end of the abdomen for about half its own length. The inner ramus is less than two-thirds the length of the outer, but is broader. Neither the uropoda nor the last segment of the abdomen are fringed with hairs.

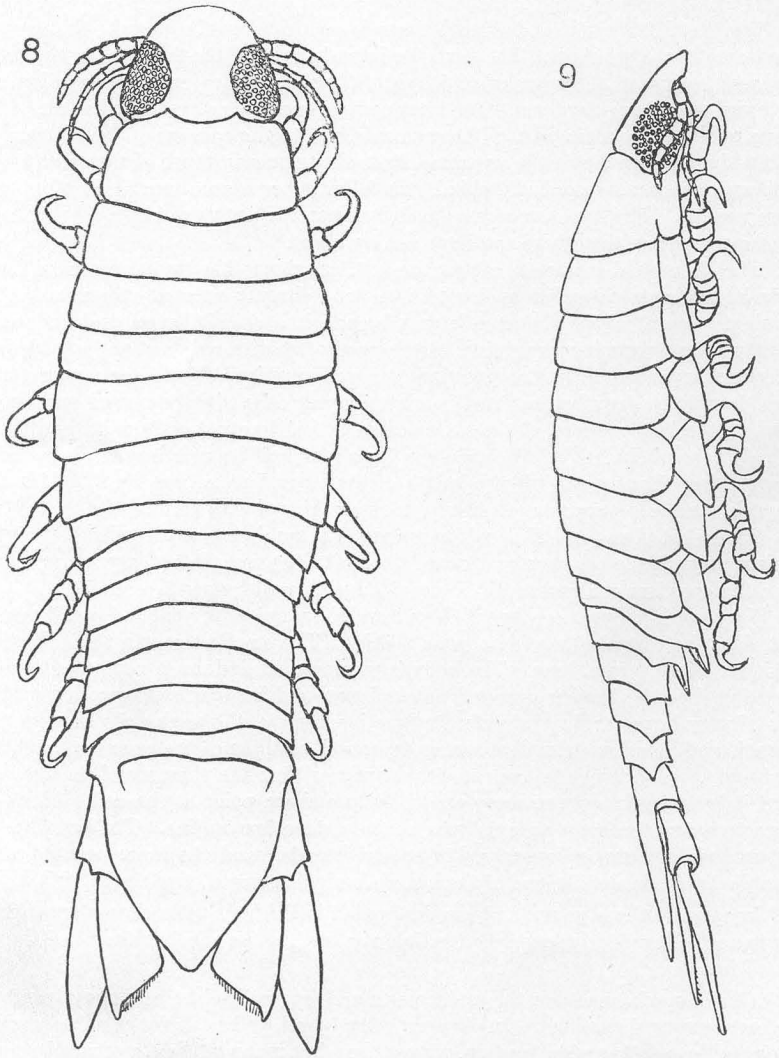
Somewhat younger individuals may equal the specimen just described in length, but are proportionately narrower, usually exhibit little or no lateral asymmetry, and have the eyes less reduced and still provided with well-formed lenses.

Very much younger specimens (Figs. 8 and 9) are quite different and would not, at first sight, be regarded as of the same species. The smallest one in the collection measures about 9 mm. long. The body is symmetrical and much narrower than in the adult, but the head is proportionately larger and broader and provided with a pair of very large, evidently perfectly functional eyes; the angles of the posterior thoracic and anterior abdominal segments, as well as those of the epimera, are little produced; the abdomen is less abruptly narrower than the thorax and its last segment is less broad, tapering more gradually to a sharp point at the end. All these characters give the body as seen from above a smoother outline. The branches of the uropoda are proportionately shorter and broader, and the inner pair (in very young individuals also the end of the last abdominal segment) are fringed with hairs.

In some of these young and slender-bodied individuals male characters can be recognized. The older, wide-bodied individuals, such as the one first described above, are all females.

All the specimens have the under parts and legs yellowish; the upper parts in the best preserved specimens are olive with two broad, yellowish, longitudinal stripes separated by a rather wide, median, olive stripe; but many of them, perhaps because of fading, are better described as mostly yellowish above with three olive stripes.

Schiœdte and Meinert (1881) give the following distribution for this species: Gorée, Senegal; Gaboon; Cape of Good Hope; Cape Agulhas (Cape Colony). Stebbing (1910) also records it from Cape Colony. The




Figs. 8 and 9. *Nerocila cephalotes* Schiœdte and Meinert, 1881. Young individuals, × 7.5.

reader is referred to Schiœdte and Meinert's work for a more particular description. They had the advantage of having both older (36.5 mm. long) and younger (4.7 mm. long) specimens for study than those obtained by the Congo Expedition, which are as follows:

Cat. Nos. 3234 and 3239. St. Antonio, August 1915. About 50 specimens.
Cat. No. 3248. Banana. July–August 1915. 5 specimens.

All were found on marine fishes (chiefly *Caranx*) brought to market. They were adhering to various parts of the body or fins of the fish, sometimes more than one of the isopods on one fish.

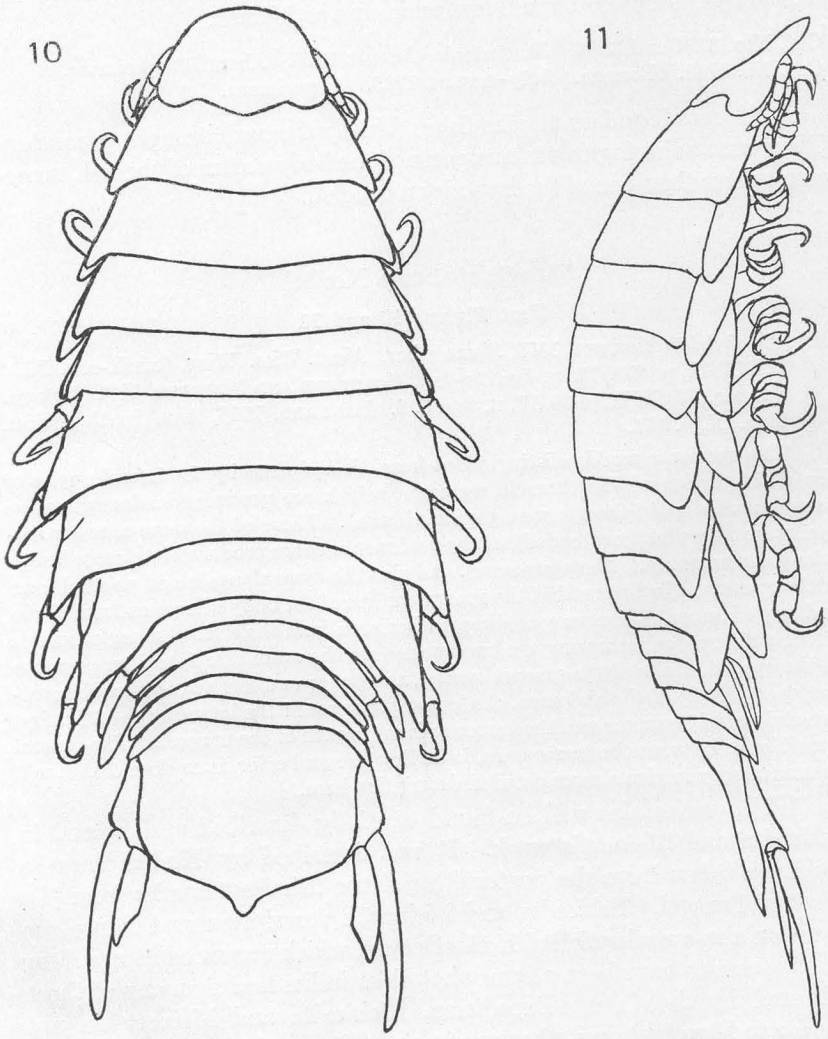
### **Nerocila rhabdota** Kœlbel

Text Figures 10 and 11

*Nerocila rhabdota* Kœlbel, 1879, Sitzungsber. Akad. Wiss. Wien, (math.-nat. Kl.), LXXVIII, p. 409, Pl. II, figs. 2*a*–2*c*. Schiœdte and Meinert, 1881, Naturh. Tidsskr., (3) XIII, p. 39, Pl. II, figs. 5, 6. Barnard, 1914, Ann. South African Mus., X, p. 371.

This species is readily distinguished from *N. cephalotes* by the lateral angles of the main portion of the thoracic segments, which are produced backward (more conspicuously in old than in younger individuals). Those of the more anterior segments are only slightly extended but the posterior ones are produced into conspicuous triangular processes. These processes, and also the more elongate and pointed form of the epimera, affect somewhat the general outline of the body when seen from above and are, of course, still more conspicuous when seen from the side. Among other less striking differences separating the two species are the more complete disappearance of the eyes in adults of the present species, the larger and less angular median projection at the tip of the abdomen, the longer processes at the lateral ends of the first two abdominal segments and the narrower inner branch of the uropoda. The general resemblance between the two species, including size and color, is so close that it will be unnecessary to give a more detailed description here.

This species also will be found carefully described and figured in Schiœdte and Meinert's work. It was described by Kœlbel from a specimen taken from the pectoral fin of the fish *Psettus sebæ* from the coast of Senegal. Schiœdte and Meinert's description and figure are based on a re-examination of Kœlbel's type, which measured 25 mm. long and appears to have been a somewhat older individual than any of those collected by the Congo Expedition. Schiœdte and Meinert do not appear to have had any other specimen. The species has recently been reported from South Africa by Barnard (1914). Four individuals (Cat. No. 3237) of this species were picked out from among the numerous specimens of *Nerocila cephalotes* taken from market fishes (chiefly *Caranx*) at St. Antonio, August 1915. The largest of them (Figs. 10




Figs. 10 and 11. *Nerocila rhabdota* Kœlbel, 1879. Female, × 5.4.

and 11) measures 22 mm. long. It has no brood-pouch but numerous small, brown eggs are cemented to the posterior thoracic legs and some of the pleopods and adjacent parts of the ventral regions of the body. Another example, though not quite so large, has a well-developed b rod-pouch. The other two are not fully adult.

The smaller number of specimens obtained indicates that it is a much less common species than *N. cephalotes*.

*Nerocila acuminata* Schiœdte and Meinert, 1881, from the southern United States and West Indian region, is a closely allied species.

### **Cymothoa plebeia** Schiœdte and Meinert

Text Figures 12 and 13

*Cymothoa plebeia* SCHIŒDTE AND MEINERT, 1884, Naturhist. Tidsskr., (3) XIV, p. 236, Pl. IX, figs. 1, 2.

A single male, apparently fully adult, was collected by the Expedition.

The body as seen from above is oblong, widening somewhat toward the rear, though the last thoracic segment is a little narrower than the sixth. Abdomen deeply set into the thorax, narrow in front, widening very rapidly to the large terminal segment, which is but little narrower than the thorax. Seven thoracic and six abdominal segments distinct and separate.

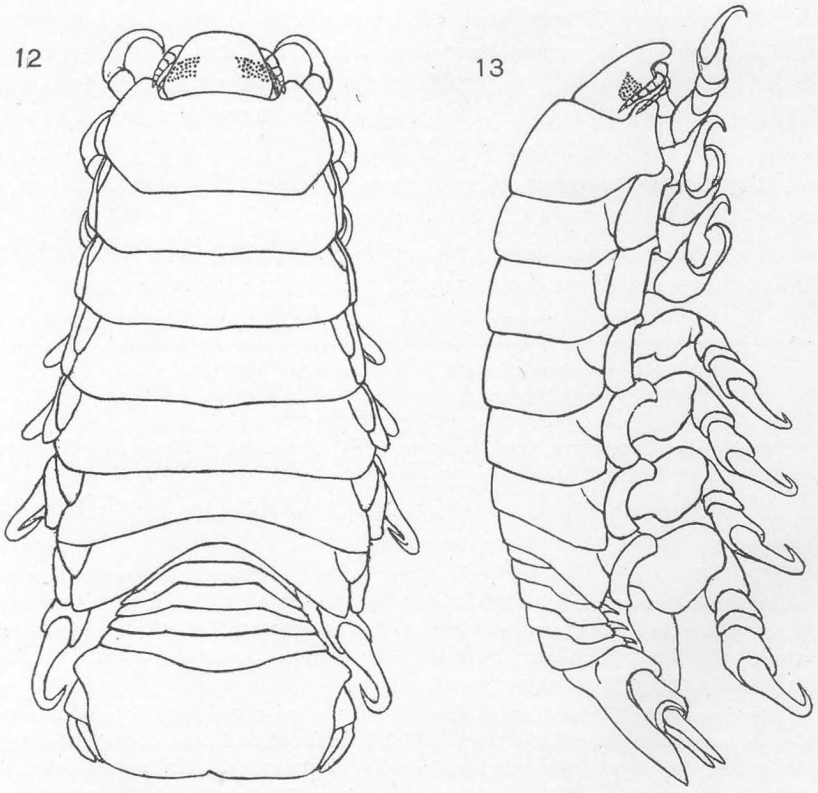
Head somewhat triangular, broader at the posterior end than it is long, with sides that converge toward the front, which is rounded and bent downward in the middle over the bases of the antennæ. The latter are cylindrical; the first antennæ are much stouter and a little longer than the second, and arise widely separated from each other; both pairs have eight segments. Rudimentary eyes are present in the form of rather large, irregularly quadrilateral spots containing some dark gray or blackish pigment.

The first segment of the thorax is not emarginate in front; it has no raised or thickened lateral borders. The processes that extend forward each side of the head are rather short (scarcely a third the total length of the head) and somewhat triangular, with a rounded apex. No peculiarities were noted in the epimera or thoracic limbs; the posterior four pairs have the basis keeled.

Last segment of abdomen large and broad; practically smooth above; its posterior border nearly transverse, with rounded corners and a slight median notch. The second pleopoda have a straight styliform process as long as, or slightly exceeding, the foliaceous part of the appendage. The branches of the uropoda are small and narrow and curved inward; they scarcely reach the end of the abdomen.

Size: 19 mm. long; maximum width, 8.3 mm. Color, in alcohol, yellowish, not pigmented.

The specimen (Cat. No. 3263) was collected at Malela and, according to the label, came from the inner side of the gills of a marine fish.




Figs. 12 and 13. *Cymothea plebeia* Schiœdte and Meinert, 1884. Male, × 5.6.

Schiœdte and Meinert describe this species from a single female from Cape Verde, the male being unknown. Making the necessary allowance for sexual difference, the agreement of the present specimen with their species seems satisfactory.

### **Ichthyoxenos expansus,** new species

Text Figures 14 and 15

The only specimen is a female which is nearly if not quite adult, as the brood-pouch is large and well distended.

The body is symmetrical and broadly elliptical in outline. Its width slightly exceeds two-thirds its total length, and the head and abdomen are deeply set into the thorax; the back is only very moderately arched with a somewhat flattened

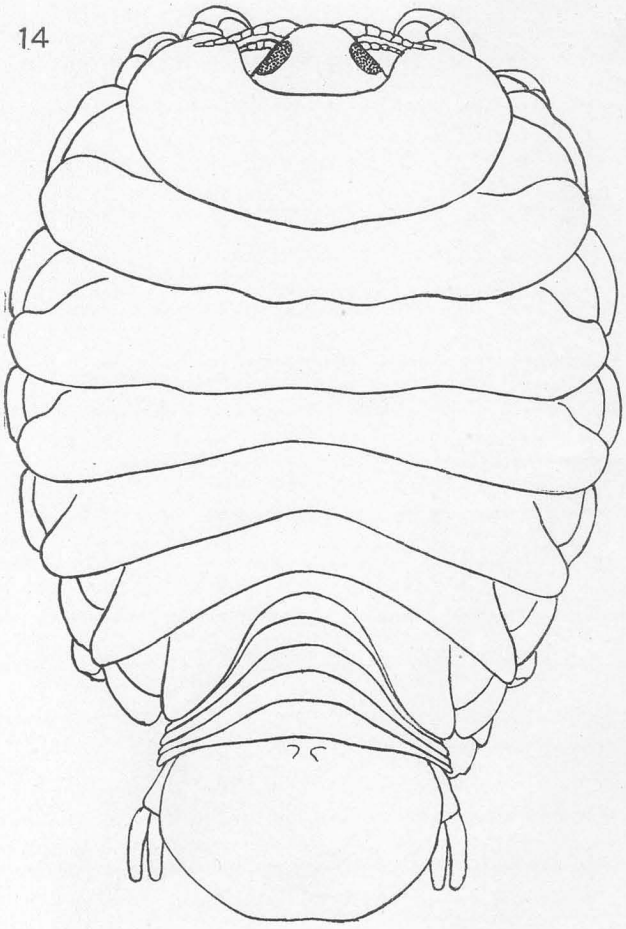



Fig. 14. *Ichthyoxenos expansus* new species. Female, × 7.5.

curvature; its surface is smooth and shining in spite of some minute irregular sculpturing visible only on magnification. Seven thoracic and six abdominal segments are distinct and separate.

Head small, so deeply set back in the thorax that it projects but little beyond the general outline of the body, its dorsal surface so inclined as to be directed forward rather than upward. Seen from above, it appears triangular with the front rounded off; from in front it is more nearly square. The eyes are fairly large, laterally placed elliptical areas of blackish pigment. Antennæ cylindrical; the first pair arise well apart and have but seven segments, of which the basal one is somewhat swollen. The

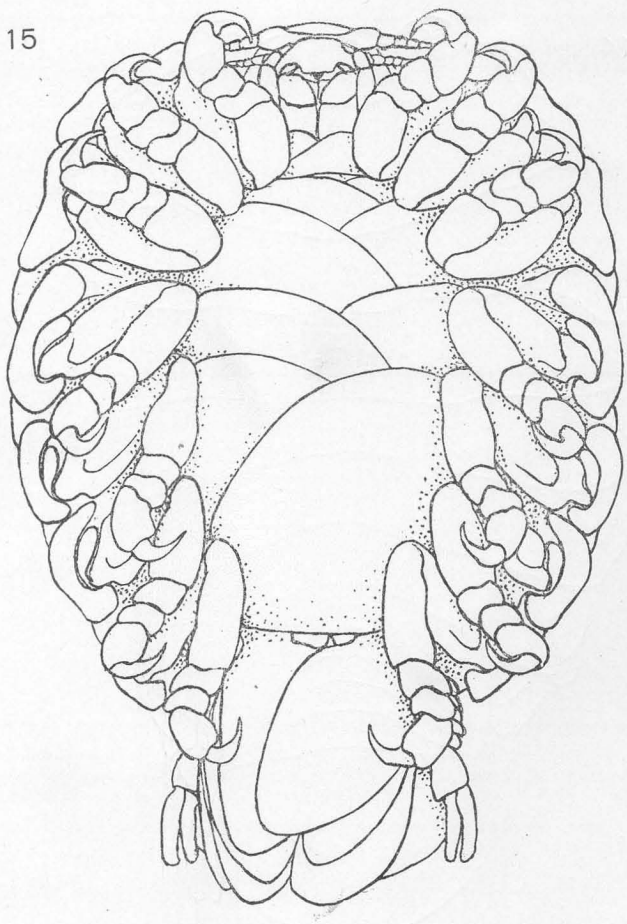



Fig. 15. *Ichthyoxenos expansus*, new species. Female, × 7.5.

second pair are slenderer and a little shorter, but likewise have seven segments. Mandibular palps long and tapering and composed of three segments. Maxillipeds without a foliaceous plate; they have palps of two flattened articles.

The thorax comprises by far the greater part of the body; the first segment is very large, semicircular as seen from above, with its anterior margin hollowed out in the median part to receive the head. The lateral ends (directed forward and slightly outward) are rounded off but not produced into projecting lobes. The remaining segments decrease successively in length (when measured on the mediam line) except the fourth, which is shorter than would be expected from its place in the series. The seventh is very short on the median line on account of the very deep

excavation of its posterior border to receive the abdomen, but it is quite wide at the ends, which are directed almost backward and reach near to the anterior margin of the terminal abdominal segment. Epimera distinct on all the thoracic segments except the first; they are thick and crescent-shaped, but do not reach quite as far back as the posterior corners of their segments. The latter are rounded off and not produced. The legs are all much alike except for a gradual increase in length toward the posterior end of the body. They are of the usual prehensile type, ending in fairly large, curved claws. Their basal segments are not conspicuously keeled.

Abdomen short and rather narrow, especially anteriorly, set into the thorax nearly to the base of its terminal segment, which is large and broad, rounded behind, and longer than the other five abdominal segments taken together. These latter increase in length from the first to the last; they are short longitudinally and extended transversely, their lateral parts being closely crowded together and not produced. The pleopoda are large and leaf-like, of ovate outline and smooth-edged. The uropods are small; their branches, which do not reach as far back as the end of the last segment, are rather narrow and of about equal length and rounded at the tip. The outer one is slightly curved inward; the inner one is straight.

Total length of specimen, 16 mm.; width, 11 mm. Color, in alcohol, yellowish, with a few faint and very minute dark pigment-spots on the head and fore part of the first thoracic segment.

The single specimen (Cat. No. 3261. Type) was taken from the gills of a characinid fish (*Eugnathichthys eetveldii* Boulenger, 1898) about one foot long, collected at Poko on one of the tributaries of the Uele River, July 1913.

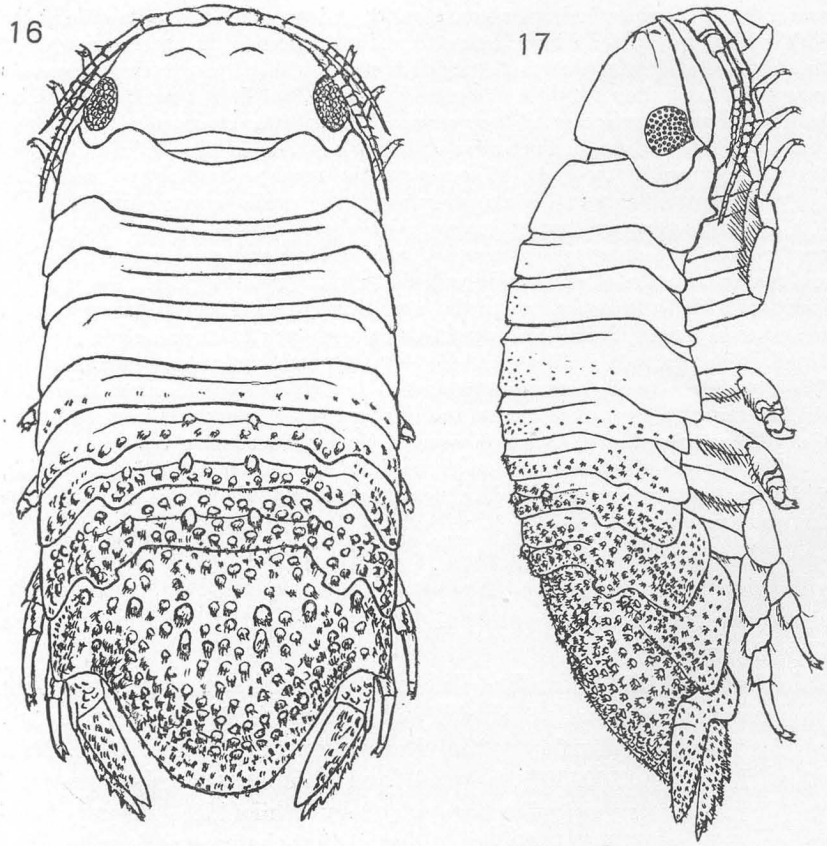
Herklots (1870) described the type species of this genus, a parasite on a river-fish of Java. Schiœdte and Meinert (1884) added a second species from the Himalayas, and Richardson (1913, Proc. U. S. Nat. Mus., XLV, pp. 559–562), a third from a Japanese fresh-water fish. Another Japanese species has been added by Ishii (1916, Annot. Zool. Japon., IX, pp. 125–131, 10 figs.). Except that the present form has the first antennæ a little dilated at the base, it agrees well with the generic characters assigned by Schiœdte and Meinert, though its widely separated habitat may arouse a suspicion that we have here not a natural genus but a case of convergence of species that have evolved separately from related marine forms, perhaps those of the genus *Livoneca*, from which *Ichthyoxenos* is distinguished by only very slight characters.

## Sphæromidæ

### **Sphæroma destructor** Richardson

Text Figures 16 and 19

*Sphæroma destructor* Richardson, 1897, Proc. Biol. Soc. Washington, XI, pp. 105–107; 1900, Amer. Naturalist, XXXIV, p. 223; 1901, Proc. U. S. Nat. Mus., XXIII, p. 534; 1905, Bull. U. S. Nat. Mus., No. 54, p. 282, figs. 294–298.




Figs. 16 and 17. *Sphæroma destructor* Richardson, 1897. Female, × 11.5.

(?) *Sphæroma terebrans* BATE, 1866, Ann. Mag. Nat. Hist., (3) XVII, p. 28, Pl. 1, fig. 5.
*Sphæroma terebrans* STEBBING, 1904, Spolia Zeylanica, II, part 5, p. 16 (in part). HANSEN, 1905, Quart. Journ. Micr. Sci., XLIX, part 1, p. 116 (in part). STEBBING, 1908, Ann. South African Mus., VI, pp. 48, 49, 427 (in part); 1911, Rec. Indian Mus. Calcutta, VI, pp. 181, 182 (in part).

The body is stout, short, and highly arched; in its general outline and in its power of rolling into a ball superficially resembling some of the terrestrial isopods. The dorsal surface is granular, on the posterior half of the body the granules are coarse and the larger ones bear tufts of minute hairs to which mud adheres. The thoracic segments, especially the fourth and fifth, have on the dorsal part a well-marked transverse ridge, and more or less well-developed paired tubercles are present on the last one or two of the thoracic and on the abdominal segments, of which there are but two in this genus. The posterior end of the abdomen is broad and obtuse; its posterior lateral margins are conspicuously bent upward.

The first and second antennæ have flagella with 8 or 9 and 12 or 13 articles respectively.

The first legs have a short spine on the inner distal end of the propodus. It is present in both sexes but is wanting on the other legs. All the legs, however, including the first, have a short rounded extension of the posterior aspect of the propodus, which overlaps the base of the dactylus.

The number of teeth on the outside edge of the external branch of the uropoda has been used as a distinguishing character in the species of this group. The Congo specimens indicate that it is not reliable for such a purpose. They have from three to five well-formed teeth in addition to the apical point. The proximal tooth is often so reduced as to make it doubtful whether it should be counted or not, or it may be poorly developed or wanting on one side only.

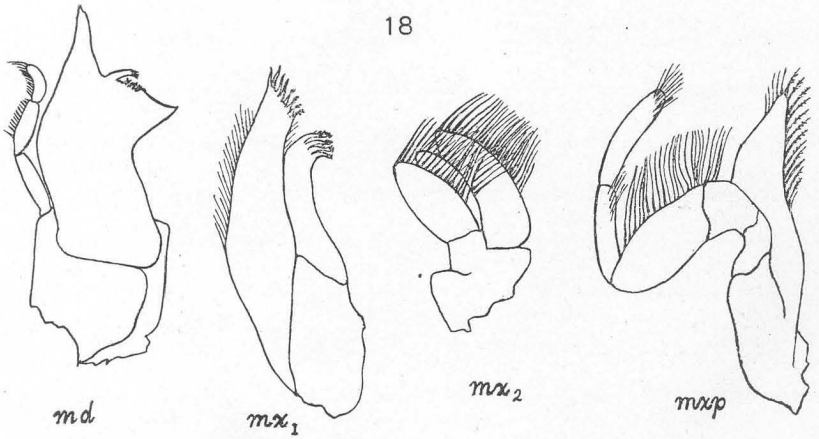



Fig. 18. *Sphæroma destructor* Richardson, 1897. Mouth-parts of female, × 24.

The drawings here reproduced are from a female. The males are, however, closely similar in general form, size, and appearance, but, as a rule, have the tubercles of the dorsal surface a little more prominent. Often there are fairly well developed tubercles on the sixth as well as the seventh thoracic segment and one or two pairs of small tubercles posterior to the central pair on the last abdominal segment. The males also have the postero-lateral borders of that segment more broadly and conspicuously turned up than the females. This gives the posterior end of the body a slightly narrower outline as seen from above.

A more detailed description can be found in Richardson, 1905.

The largest individuals measure 9.5 mm. to 10 mm. long to the tip of the abdomen. Their color varies from yellowish to a fairly dark brown or greenish brown, the color being due to minute, irregularly branching pigment-spots.

About two hundred specimens (Cat. Nos. 3236 and 3245) were collected in submerged mangrove roots in certain creeks near Banana, where the water is quite strongly saline. Mr. Lang states that, though

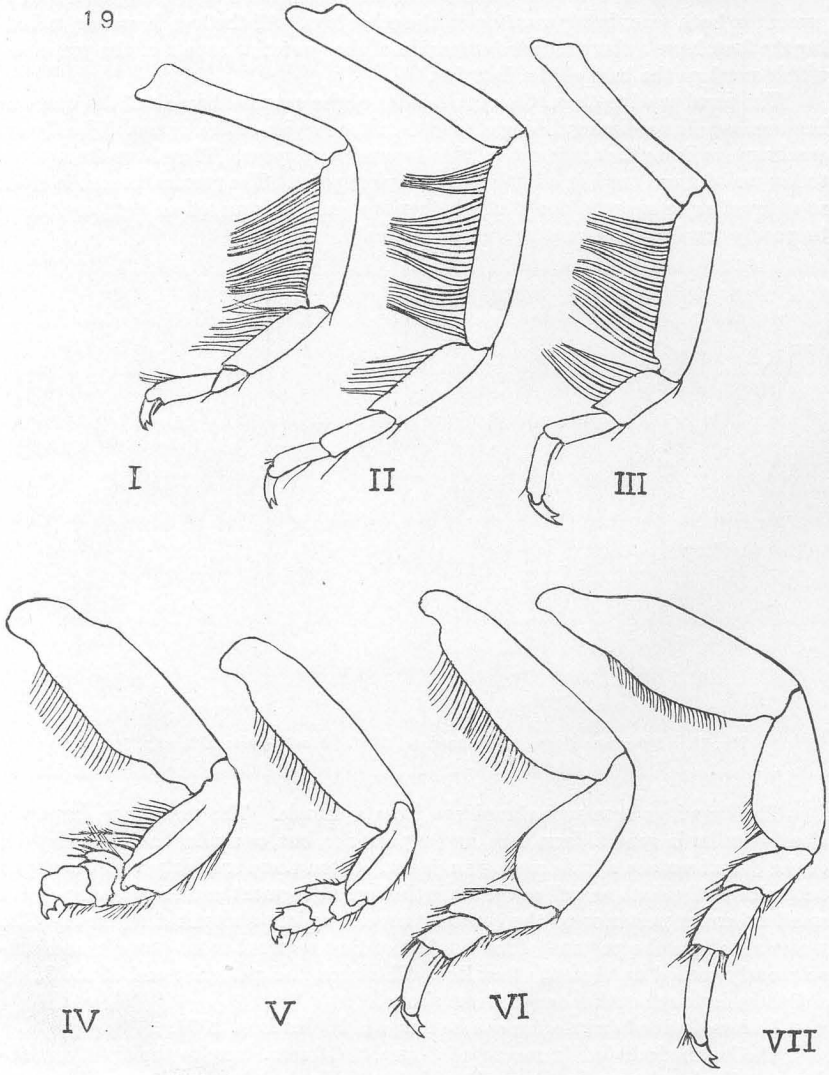



Fig. 19. *Sphæroma destructor* Richardson, 1897. Legs of right side of female, external aspect, × 18.

abundant, its distribution was very local and that it was wanting from many apparently favorable stations in the vicinity, also that their burrows in the roots extended to, if not actually into, the sound and living parts of the roots, appearing to cause their progressive death and decay.

I have been unable to find any material differences separating the Congo Expedition specimens from Richardson's *S. destructor* described from Palatka, Florida, as far as the careful descriptions and figures given by that authority enable me to judge, in spite of the fact that the Florida specimens must have been from completely fresh water while the Congo specimens, as is shown by their boring in mangrove roots, lived in quite strongly saline water. Stebbing (1904) has reduced *S. destructor* to a synonym of *S. terebrans* Bate, 1866, from Brazil. The explanation he gives of the peculiarity in the mandibular palpus in *S. erebrans* as shown by Bate's figure is a very plausible one and, with this difficulty removed, the reasons against accepting Stebbing's view do not seem at all conclusive. Nevertheless, as Miss Richardson's species is based on a full description and a number of careful figures, it would be neither just nor safe to displace it until more is known about the Brazilian form.

Stebbing in the same article also reduces *S. vastator* Bate, 1899, from India, Ceylon, and South Africa (see also Stebbing, 1908, p. 49) to a synonym of *S. terebrans*. There are a few South African specimens in the American Museum collection (Cat. No. 54) from the piling of a bridge over the Isipingo River, Natal, which probably represent *S. vastator*. A comparison of these with the Congo specimens shows the resemblance to be very close. The tubercles of the back are slightly more prominent, the last segment of the abdomen is a little narrower and more angular in outline, and the legs are possibly a little stouter in the Natal specimens, but the differences are of a very slight and relative character and, without additional material, I am unable to decide how much importance should be attributed to them. *S. bigranulatum* Budde-Lund (1908, p. 304, Pl. XVII, fig. 55) from Zanzibar can hardly be a synonym of *S. vastator*, unless considerable allowance is to be made for inaccuracy in the figure of it published in that work.

## Superfamily **BOPYROIDEA** (= Epicaridea)

### **Bopyridæ**

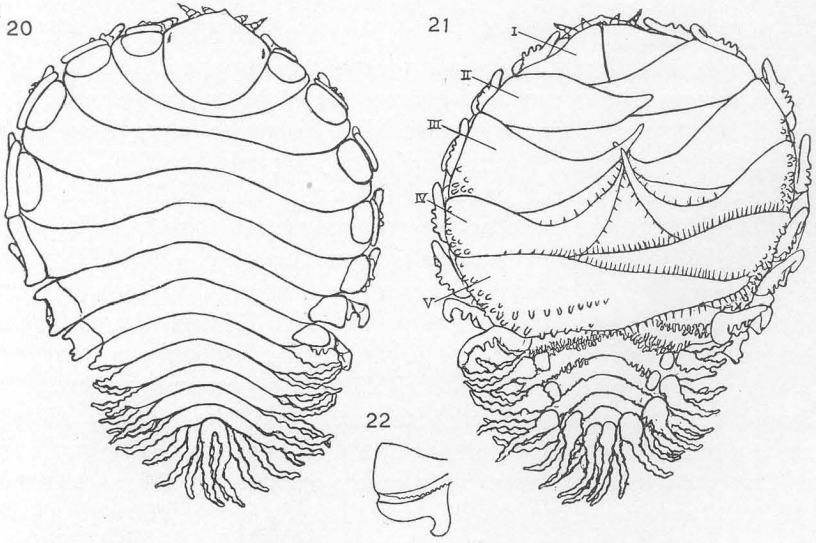
### **Pleurocrypta langi,** new species

Text Figures 20 to 22

But one specimen of this species was obtained, a female probably not fully adult, having a large but empty and not completely closed brood-pouch.

Body as seen from above very widely oval, the widest part far forward; the anterior end very broadly rounded, the posterior end narrow. Outline conspicuously asymmetrical, the convexity of the axis being toward the left side. Seven thoracic and six abdominal segments are distinct and separate. Dorsal surface flat and smooth; the lateral bosses (present on the four anterior body segments) are rather small. Length of body to tip of abdomen, 4.8 mm.; width, 4 mm.

Head narrow, but little wider than long, deeply set back into the thorax; the posterior border quite evenly curved, the anterior obtusely triangular with convex sides and a minute rounded median projection or rostrum at the apex. Its anterior border extends conspicuously out beyond the general outline of the front end of the body. Rudiments of eyes in the form of elongate spots of pigment are present. Antennæ well developed, the first with three, the second with at least five distinguishable segments.




Figs. 20 to 22. *Pleurocrypta langi*, new species.
20 and 21. Dorsal and ventral aspects of female, × 12.
22. First opercular plate of left side, ventral aspect, × 9.

First thoracic segment very short on the median line, longer at the ends; the third segment is the longest and from that point the thoracic and abdominal segments diminish fairly regularly in length to the posterior end of the body. The epimera of the first four body segments are narrow borders, only the fourth is of the full length of the end of the segment. The epimera of the fifth, sixth, and seventh are successively wider and are as long as the segments; they end off squarely but have the anterior and posterior lateral angles projecting a little; the seventh has a small additional tooth just anterior to the posterior lateral angle. (This description is of the left side, the epimera of the right side are not well developed.) Legs of the prehensile type, moderately long for an animal of this group; minute claws appear to be present,

at least on some of them. The basis of these limbs has a dentate crest, and this and other proximal segments of these limbs have a few irregular papilla-like projections on the external aspect.

The first five abdominal segments have their lateral ends extended into tapering flexible processes whose borders are coarsely and simply toothed or deeply sinuate; these processes or extensions of the segments show evidence of incomplete segmentation in some of the narrow constrictions caused by the indentations. The pleopoda of these segments consist of two branches each, their basal portion is a mere projection on the surface of the abdomen of irregular, somewhat papillated outline; the branches are both similar in character and size to the above described lateral processes of the segments. The sixth abdominal segment is very small and its lateral ends bend directly backward. They are extended into processes similar to those of the other segments and to the branches of the pleopoda. Uropoda, if not wanting, must be represented by these extensions of the sixth segment, for all other appendages appear to belong to the other five segments, though their crowded condition makes this difficult to demonstrate.

Brood-pouch large, composed of five pairs of plates. Except the specially modified first pair (see Fig. 22), they end in tapering points which overlap but do not completely close the pouch. The last two pairs bear short hairs along the edges.

Many parts of the body are studded with small, irregular, rounded projections or papillæ. They are present, as already mentioned, on the proximal segments of the legs and occur also in abundance on the ridges marking the abdominal segments on the ventral side of the body between the pleopoda, on the bases of the latter, and a few even on the proximal parts of the exposed surfaces of some of the plates of the brood-pouch, especially on the fifth pair.

Color, in alcohol, yellowish, without pigment-spots.

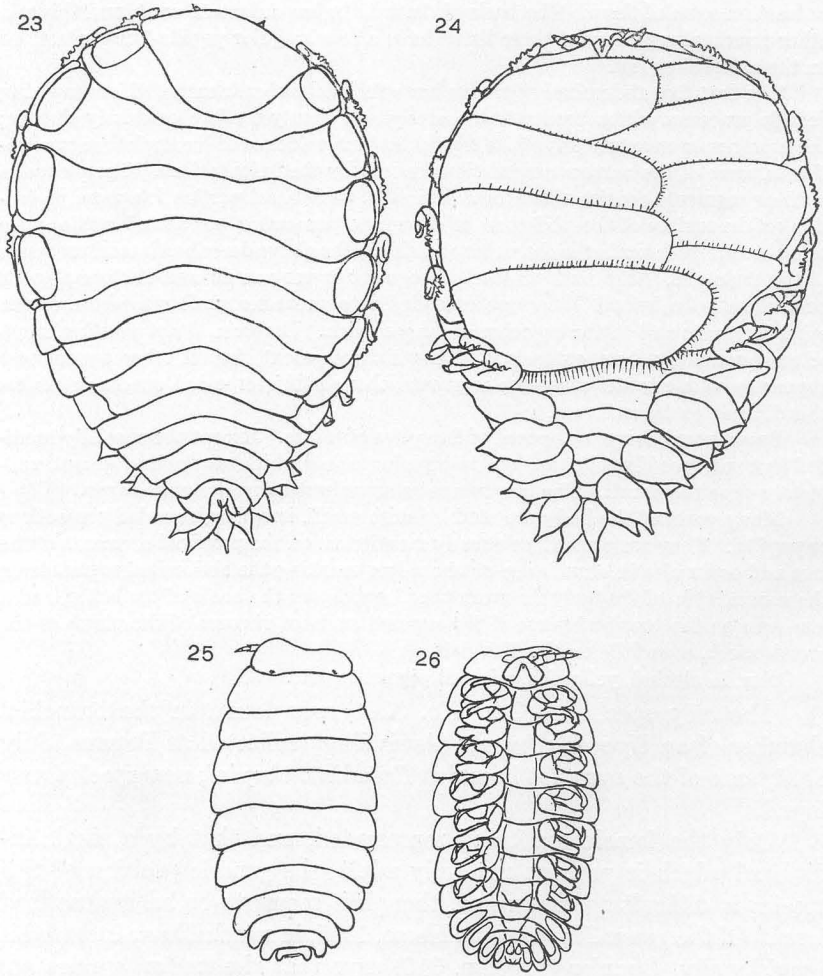
The only specimen (Cat. No. 3246) was found in the branchial chamber of an *Upogebia furcata* (Aurivillius) collected at Banana, July 1915, one of the same lot in which *Pseudione chapini*, new species, was found.

Only the female sex being represented, and that by a single individual which is perhaps not fully adult, the generic position of this species is difficult to determine, though it seems to be an undescribed form. Of the genus *Pleurocrypta* Hesse, 1865, in which I have included it provisionally, Bonnier (1900, p. 310) says that the known species are parasites of Anomala of the genera *Galathea* and *Porcellana*, and that two undescribed species have been reported parasitic on Paguridæ. Several members of the family Bopyridæ have been recorded as branchial parasites of *Upogebia*. Three are enumerated by Nobili (1906) and another is added by Hay (1917). The present collection adds two.

### **Pseudione chapini**, new species

Text Figures 23 to 26

There are two well-preserved females in the collection, both similar in size and characters.




Figs. 23 to 26. *Pseudione chapini*, new species.
23 and 24. Dorsal and ventral aspects of female, × 9.
25 and 26. Dorsal and ventral aspects, of male, × 18.

Body as seen from above broadly oval in outline, narrowing rapidly but evenly toward the posterior end, which is rounded. Both specimens strongly asymmetrical, one with the axis convex toward the left, the other with it convex toward the right side.

Dorsal surface flat and smooth; lateral bosses are developed on the first four body segments. Seven thoracic segments and six abdominal segments are distinct and separate.

Head wider than long, deeply set back in the thorax; its anterior border is without a raised or thickened edge and is slightly convex in outline, conforming to the general oval curve of the body. No eyes; antennæ very short, the first pair with three, the second with four segments distinguishable.

First thoracic segment very short in the median part; the fourth is the longest; the succeeding thoracic and abdominal segments diminish quite regularly in length toward the posterior end. Lateral parts of the more posterior segments of the body bent backward, the last two or three very strongly so. Epimera of first four thoracic segments very distinct but narrow and shorter than the segment; those of the fifth, sixth, and seventh are wider and as long as the segment, but so fused with it that the line of union is more or less indistinct. The lateral ends of the thoracic and abdominal segments and their epimera conform to the general body outline, being slightly rounded or nearly square without produced angles.

Brood-pouch covering the entire lower part of the thorax but leaving the mouth-parts exposed. Legs small and weak, particularly those of the anterior part of the body. Basis of limbs not strongly keeled, but one or more of the proximal segments of each limb bear on the outer aspect a number of small, irregular, papilla-like or tooth-like projections quite conspicuous under moderate magnification.

The pleopoda each consist of two broad leaf-like divisions; these have the base rounded, the edges smooth, and they end in an acuminate tip. Uropoda similar to the pleopoda but consisting of one division only.

Length of largest female 7.1 mm.; width 5.2 mm. Color in alcohol yellowish, without pigment-spots.

A male individual was found clinging to the lateral ventral part of the abdomen of one of the females. It is only 2.3 mm. long, of elliptical outline when seen from the dorsal side, and little more than half as wide as it is long. It deviates very little in shape from the usual isopod type seen in many of the terrestrial Isopoda and, except that one side of the head is less developed than the other (the two antennæ of that side being wanting), the body is very nearly symmetrical. This peculiarity of the head is doubtless merely an individual one, caused by some accidental injury.

The head is wide, its posterior margin nearly transverse; it bears on the dorsal surface near the posterior margin a pair of minute, widely separated eye-spots. The first antennæ are very short and small; three segments are distinguishable in them; the second antennæ are considerably longer and have five segments, the last one ending in a pair of spines or short stiff hairs.

All the seven thoracic segments are separate and do not vary very greatly in length; the first is, however, somewhat longer and the seventh somewhat shorter than the others. Five separate abdominal segments are readily distinguishable, becoming very small toward the posterior end of the body; their lateral extremities are rounded and bent backward. This reduced number of abdominal segments would place the species in the genus *Parione*, Richardson (1910, p. 39). The tip of the abdomen is, however, in a more or less abortive condition in this family, and I cannot regard the exact extent to which this process has gone as affording any evidence of relationship or any secure basis for generic distinctions.

Thoracic limbs all well developed; the anterior ones are short and stout, of the usual prehensile type and end in fairly long, slightly curved claws; the posterior ones are similar but less stout, and the claws are much smaller and shorter. The five pairs of abdominal limbs are reduced to fleshy lobes, which probably serve chiefly as respiratory organs.

Color (in alcohol), yellowish.

Two adult and well-preserved females, to one of which the male was clinging (Cat. No. of all the specimens 3247; the larger female is the type) were obtained from the branchial chambers of specimens of *Upogebia furcata* (Aurivillius), a thalassinid crustacean about one inch long which burrows among the roots of mangroves, in July 1915, near Banana. There was but one female in each host. Two more specimens of the host in the same lot had bopyrid parasites (in one case one on each side of the body) that were very likely of this same species but that were in too advanced a state of disintegration to make out much of their structure.

I have not been able to identify this with any previously described form. It is closely allied to both the American species *P. furcata* and *P. curtata* Richardson, 1904 (see Richardson, 1905), but is distinguishable from the former by the absence of a raised margin on the front of the head and by the wider pleopoda and from the latter by the form of the abdominal segments in both sexes, also apparently from both by the presence of papillæ on the legs, which Richardson does not mention. But some of these differences appear to be of slight importance, and the validity of species so separated cannot be regarded as well established. *P. upogebiæ*, Hay, 1917, from South Carolina, which, as its name shows, is also parasitic on a *Upogebia*, differs in having the pleopoda provided with digitate processes, as well as in other characters. Two other species of this genus have been described as parasitic on European species of *Callianassa*, a genus of burrowing Macrura allied to *Upogebia*. These are *Pseudione callianassæ* Kossmann, 1881, and *P. dohrni* Giard and Bonnier, 1890. The latter differs in having the pleopoda with thickened papillated margins; the former has been too incompletely described and figured to be taken into consideration here.

## Superfamily **ONISCOIDEA**

### **Ligydidæ**

### **Ligyda exotica** (Roux)

Text Figures 27 to 30

*Ligyda exotica* RICHARDSON, 1905, Bull. U. S. Nat. Museum, No. 54, p. 676, figs. 716–718; 1910, Marine Isop. Philippines, p. 41; 1910, Proc. U. S. Nat. Mus., XXXVII, p. 125.

*Ligia exotica* ROUX, 1828, Crust. Médit., p. 3, Pl. XIII, fig. 9. MILNE-EDWARDS, 1840, Hist. Nat. Crust., III, p. 157. BUDDE-LUND, 1879, Prospectus gen. spec. Crust. Isop., p. 8; 1885, Crust. Isop. Terrestr., pp. 266–268. DOLLFUS, 1890, Bull. Soc. Etud. Sci. Paris, XII, p. 7 (in part); 1893, Bull. Soc. Zool. France,

XVIII, p. 189; 1893, Feuill. d. jeun. natur., XXIV, p. 24 (in part); 1897, idem, XXVII, p. 211 (int part); 1898, Bull. Soc. Zool. France, XXIII, p. 126. BUDDE-LUND, 1898, Deutsch Ost-afrika, IV, part 8, p. 10. RICHARDSON, 1899, Proc. U. S. Nat. Mus., XXI, p. 866. DOLLFUS, 1899, Proc. 4th Int. Zool. Congress, Cambridge, pp. 255, 256, 260. RICHARDSON, 1899, Ann. Mag. Nat. Hist., (7) IV, p. 335; 1900, Amer. Naturalist, XXXIV, p. 306. STEBBING, 1900, in Willey, Zool. Results, part 5, p. 646. RICHARDSON, 1901, Proc. U. S. Nat. Mus., XXIII, p. 575; 1902, Trans. Conn. Acad. Sci., XI, pp. 306–308, Pl. XL, figs. 62*a*, 62*b*. GOTO, 1906, Annot. Zool. Jap., V, pp. 267-281. DOLLFUS, 1907, Ergeb. Reise Niederl. Ost-Indien, IV, p. 381. BUDDE-LUND, 1908, in Voeltzkow, Reise in Ostafrika, p. 303; 1913, Trans. Linnean Soc. London, Zool., (2) XV, p. 391. CHILTON, 1916, Mem. Ind. Mus. Calcutta, V, p. 462, figs. 1–22; TERAO, 1915, Dobuts. Zool. Tokyo, XXVII, p 47.

? *Ligia grandis* PERTY, 1830–34, Delectus animalium articulatorum, p. 212, Pl. XL, fig. 113.

*Ligia gaudichaudii* MILNE-EDWARDS, 1840, Hist. Nat. Crust., III, p. 157. NICOLET, 1849, in Gay, Hist. Chile, III, p. 265. DANA, 1853, U. S. Exploring Exp., Crust., p. 741, XLIX, figs. 6*a*–6*h*.

? *Ligia* (*italica*) *coriacea* KOCH, 1835–44, Deutschlands Crust., p. 36; Berichtig., p. 211.

? *Ligia baudiniana* MIERS, 1877, (not Milne-Edwards, 1840), Proc. Zool. Soc. London, p. 670.

*Ligia malleata* PFEFFER, 1889, Jahrb. Hamburg. Wiss. Anst., VI, p. 36.

This widely distributed form is too well known to require an extended description here. Exclusive of the long slender uropoda, the body may reach a length of 30 mm. but none of the Congo Expedition specimens exceed 24 mm. in length in the case of male individuals, or 21 mm. in the case of females. In the alcoholic specimens the ground color is a light greenish yellow, which under moderate magnification is seen to be thickly dotted with minute, irregularly branched spots of dark pigment. These, becoming more thickly distributed on the dorsal parts of the body, give the animal a mottled greenish gray or slate color, which is, however, paler on the lateral parts of the epimera, so that the body has a lighter border along the sides.

Among the principal specific characters are the form of the body, which widens rapidly in the anterior part of the thorax and then tapers gradually to the last segment of the abdomen; the soft integument and the loose articulation and fragility of the segments of the body and their appendages (few specimens reach the museum with the uropoda and antennæ attached and unbroken); the large epimera separated from the body of the segment by a distinct suture; the large bulging eyes; very long antennæ and uropoda; and the distinct, though obtuse, angle at the tip of the abdomen. The males have on the distal end of the first leg a small flattened lateral process which overlaps the base of the dactylus on the posterior aspect of the limb. The inner edges of the carpus and merus of this limb are devoid of spines and are roughened with minute file-like oblique ridges. In the female the corresponding limb is more slender and lacks the lateral process and the ridges, but is provided with a number of spines in the position of the latter. The dorsal surface of the body is more conspicuously granulated than in *L. olfersii*.

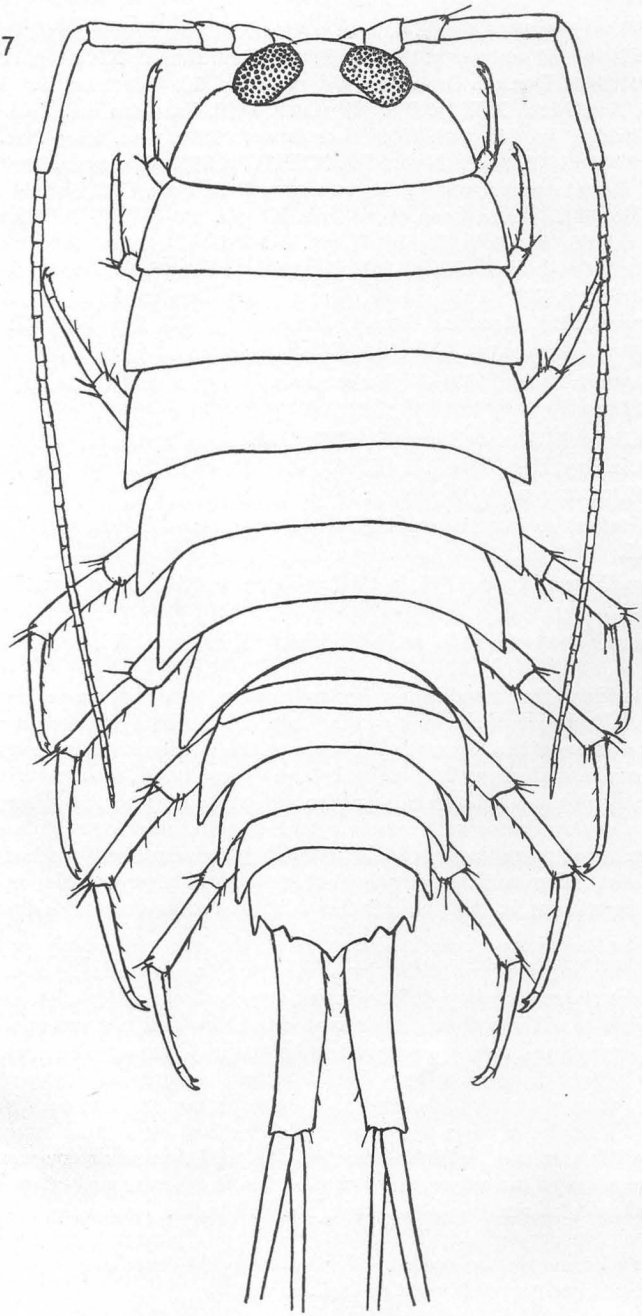
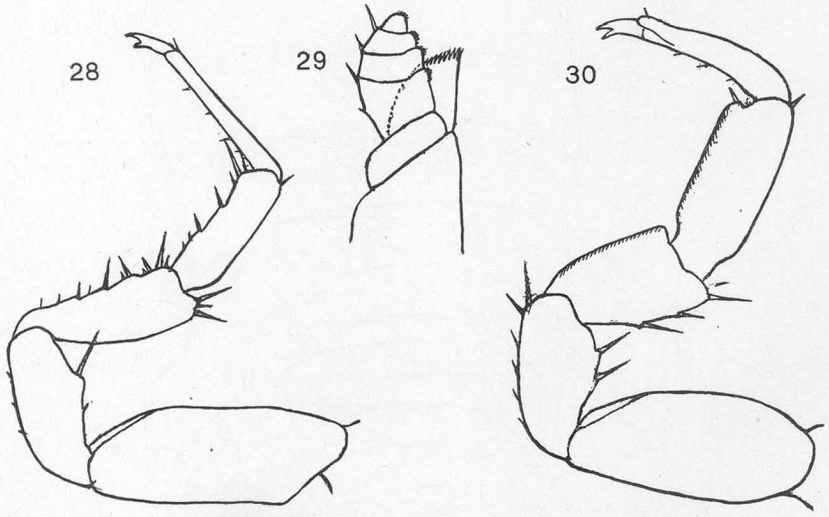



Fig. 27. *Ligyda exotica* (Roux), 1828. Female, × 6.7.

A large male specimen, 24 mm. long, has thirty-one articles in the flagellum of the second antennæ. These reach a little way beyond the posterior end of the abdomen when well drawn back. In another male, 21 mm. long (36.3 mm. long inclusive of the uropoda), the flagellum of the second antennæ has thirty-three articles. The terminal branches of the uropoda are 9.8 mm. long. In one of the larger females (length, 18 mm.; inclusive of uropoda, 29 mm.) the flagellum of the second antennæ has thirty-three articles. The antennæ reach a little beyond the end of the abdomen when well drawn back, and the terminal branches of the uropoda are 7.5 mm. long. In another female (length, 17.5 mm.; inclusive of the uropoda, 28 mm.) the terminal branches of the uropoda are only 6.3 mm. long.




Figs. 28 to 30. *Ligyda exotica* (Roux), 1828.
28. First leg of right side of female, internal aspect, × 15.
29. Tip of inner division of right maxilliped of male, × 15.
30. First leg of right side of male, internal aspect, × 12.

For a more detailed description of this species, with numerous figures and a discussion of its relationships, see Chilton, 1916.

This isopod is found creeping or running on moist rocks, piles of wharves, bridges, etc., or hiding in their crevices just above the water on the coasts of most of the tropical and warmer regions of the world. Its wide distribution may be in part due to its accidental dispersal through commerce. It has already been reported from Senegal (Dollfus, 1897) and from the eastern coast of Africa. Over fifty specimens (Cat. Nos. 3235 and 3238) are contained in the Congo Expedition collection, all obtained along the shore at Banana from stones and rocks near brackish water in August 1915.

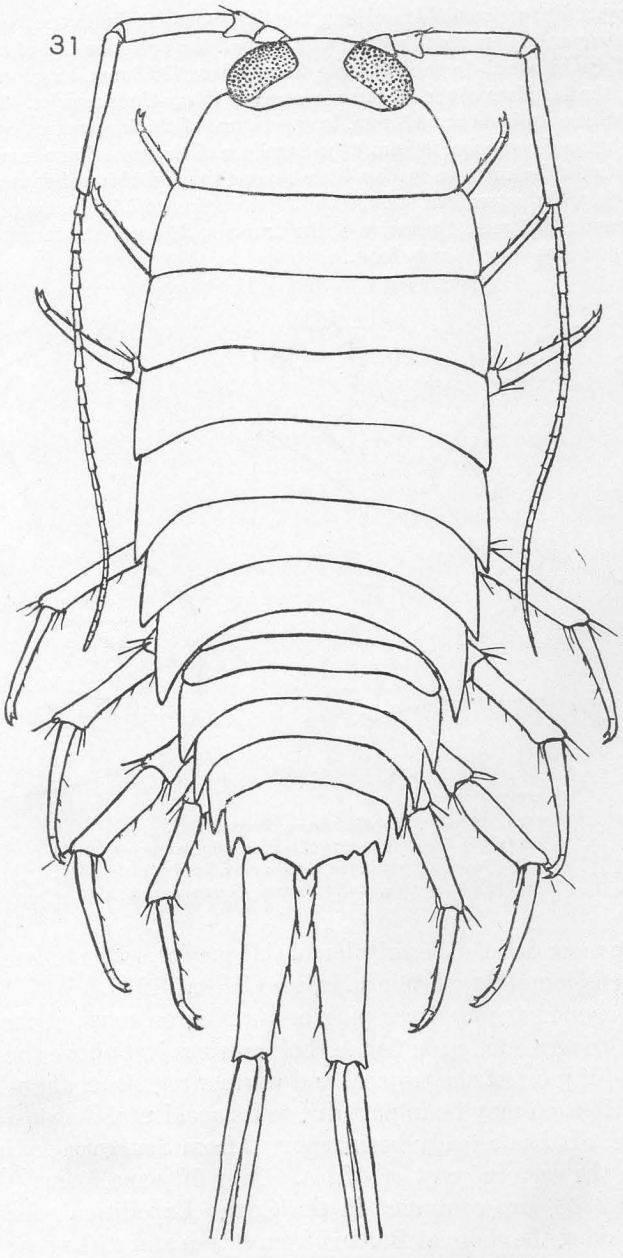



Fig. 31. *Ligyda olfersii* (Brandt), 1833. Female, × 6.7.

**Ligyda olfersii** (Brandt)

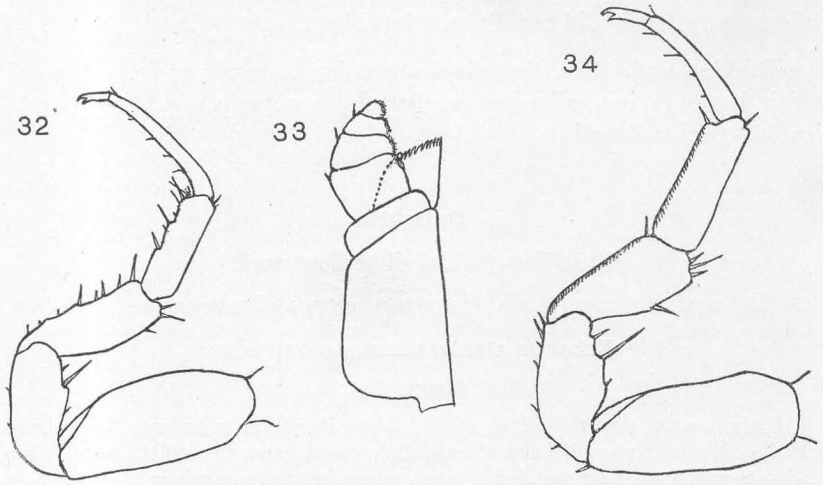
Text Figures 31 to 34

*Ligia olfersii* Brandt, 1833, Bull. Soc. Imp. Nat. Moscou, VI, p. 11. Budde-Lund, 1885, Crust. Isop. Terrestr., p. 268. Richardson, 1901, Proc. U. S. Nat. Museum, XXIII, p. 575. Chilton, 1916, Mem. Ind. Mus. Calcutta, V, p. 466.

*Ligia exotica* Dollfus, 1893, Feuill. d. jeunes natural., XXIV, p. 25 (in part); 1897, idem, XXVII, p. 212 (in part).

*Ligyda olfersii* Richardson, 1905, Bull. U. S. Nat. Mus., No. 54, p. 674, figs. 714, 715.

Resembles *L. exotica* in color and appearance but is somewhat smaller. The body is proportionately narrower, especially in its anterior portion, so that the outline seen from above is more nearly elliptical than oval. The surface is smoother, the




Figs. 32 to 34. *Ligyda olfersii* (Brandt), 1833.
32. First lef of right side of female, internal aspect, × 12.
33. Inner division of right maxilliped of male, × 24.
34. First leg of right side of male, internal aspect, × 14.

granulation being very faint and inconspicuous when the specimen is wet; the eyes are more elongated and less bulging, and the epimera much more completely fused with the main parts of the segments, while the body as a whole is firmer, less fragile and more compactly articulated than in *L. exotica*. The propodus of the first pair of legs of the male lacks the lateral process at the distal end that is present in *L. exotica*, but in the male the file-like ridges on the merus and carpus, and in the female the spines, are present as in the corresponding limbs of that species.

Females 17 mm. to 17.5 mm. long when measured to the tip of the abdomen, have twenty-nine or thirty articles in the flagellum of the second antennæ, which, when drawn well back, reach half-way along the last abdominal segment.

A male 17 mm. long when measured to the tip of the abdomen (29 mm. long to the ends of the uropoda) has thirty-five articles in the flagellum of the second antennæ, which reach, when well drawn back, half-way along the last abdominal segment. The terminal branches of the uropoda are about 7.5 mm. long.

This species is credited by Richardson (1905) with the following distribution: Key West and Puntarasa, Florida; St. Thomas, W. I.; and Brazil. There are specimens in the American Museum collections from Andros Id., Bahamas (Cat. No. 3122) and one from Guadeloupe, W. I. (Cat. No. 3123). With the material available I failed to discover reasons for considering the Congo Expedition specimens distinct from the American ones.

The Congo specimens (Cat. Nos. 3240 and 3241), fourteen in number, were all obtained at Banana in August 1915, with *L. exotica*, and were picked out from among the lots of the latter species, from which the collectors evidently did not differentiate them.

Budde-Lund, 1885, described a species *L. gracilipes* from Senegal, which, however, is smaller and has very long uropoda, the latter exceeding the body in length.

## Oniscidæ

### Eubelinæ (= Eubelidæ *auct. mult.*)

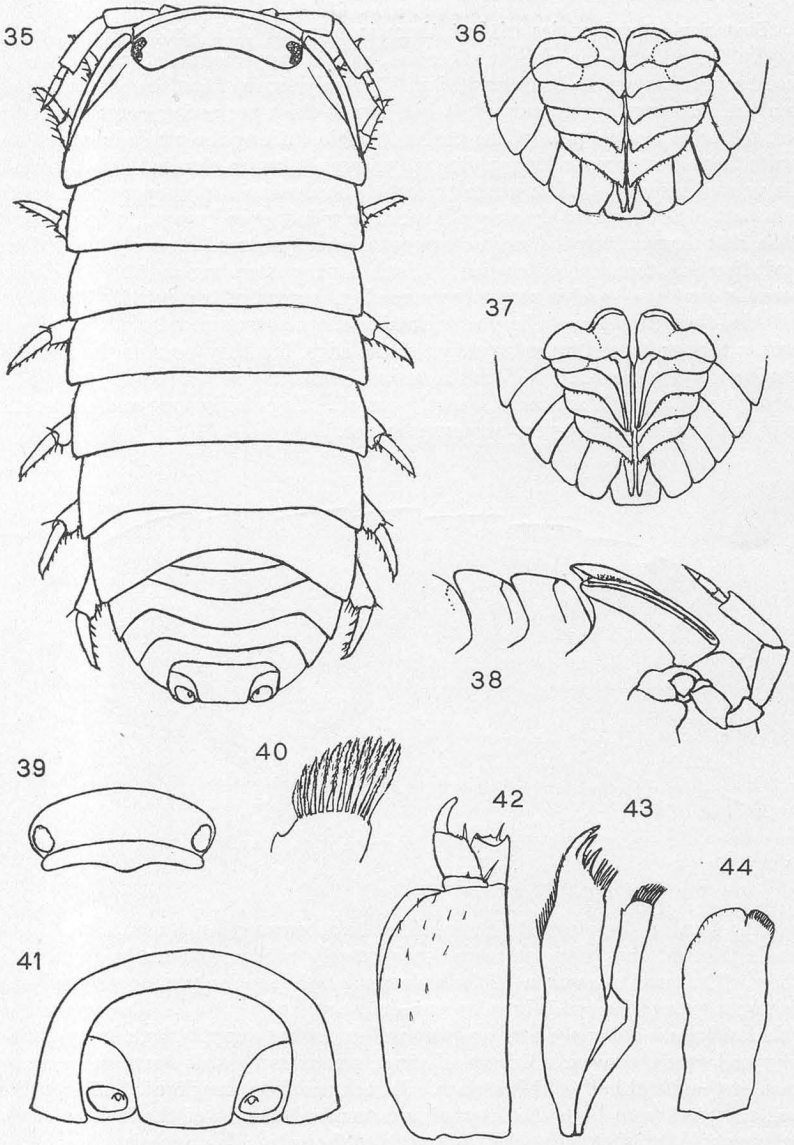
The next five species all belong to the typical subgenus of *Eubelum*.

### Eubelum stanleyanum, new species

Text Figures 35 to 45

Body convex, contractile into a ball, oblong in outline when seen from above, with the sides nearly parallel except for a slight convergence toward the rear; it is of moderate width, broadly rounded in front, somewhat more narrowly so at the rear. Surface smooth, with thickly distributed minute pits, visible on magnification, but without granulation and without more than a slight trace of pubescence. Color of upper parts varying from gray to brownish with yellowish markings and margins on the segments. Some of the specimens have the epimeral parts of the segments, and most of them have the exposed parts of the uropoda, yellowish in more or less contrast to the adjacent darker parts. Under parts and legs yellowish. Size of large females about 11 mm. long; males about 9 mm.

Head of moderate width, the epistome with a rather prominent, strongly upturned superior margin; the anterior outline of the head seen from above is gently arched. Eyes rather large, with about seventeen ocelli. Antennæ short and rather stout; their first segment small and very short, their fifth segment not greatly longer than the fourth; the flagellum is rather indistinctly three-segmented, having the first and third articles about equal and considerably shorter than the second. First maxilla with eight long sharp teeth (3+5), with an additional, very small, accessory tooth beside the second tooth on the outer division, and a row of about eleven plumose processes on the inner division. These processes are so closely crowded that an exact count is difficult.




Figs. 35 to 44. *Eubelum stanleyanum*, new species.
35. Female, × 8.4.
36. Pleopoda of female, × 8.4.
37. Pleopoda of male, × 10.
38. Antenna and outline of anterior segments, ventral view, × 9.6.
39. Outline of head, front view, × 9.
40. Tip of inner division of first maxilla, × 100.
41. End of abdomen, posterior view, × 16.
42. Inner division of maxilliped, × 36.
43. First maxilla, × 40.
44. Second maxilla, × 36.

Posterior lateral angles of first thoracic segment little produced and rather broadly truncated in an oblique direction, with a very short cleft to receive the second segment when the body is rolled up. Lateral margin of first segment when seen from the side very gently curved; it has a wide thick projecting border extending back to the truncated part of the posterior angle. Along the whole length of this border there is a narrow sulcus on the external aspect, but so situated that it is visible in a ventral view also. The whole projecting border is sharply separated from the main part of the segment by a deep but rather widely open groove. The inner side of the cleft for receiving the second segment is more produced in an obliquely downward direction than the outer side (though hardly extending as far in a directly posterior direction), and is narrowly rounded off instead of truncated. The second and third thoracic segments have a thickening of the anterior border of the epimeral part, as though caused by an infolding of the edge, but they bear no process. The lateral ends of the second to fifth (inclusive) segments are somewhat rounded off; the sixth and seventh are more squarely cut off. Legs fairly long and moderately stout, with stout but not very numerous spines.

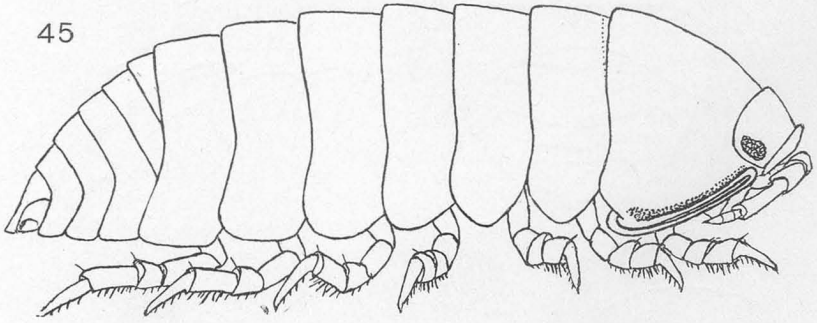



Fig. 45. *Eubelum stanleyanum*, new species. Female, × 9.6.

The form of the pleopoda is shown in the accompanying illustrations. In the female the first two pairs are more conspicuously swollen and tracheate than the others. The terminal segment of the abdomen has the median portion very wide and slightly tapering; the end is broadly and almost squarely cut off. The exposed part of the uropoda is obliquely quadrangular and somewhat elongate, its external surface only moderately convex. A large, shallow, transversely oval depression occupies much of the distal half of this surface. In, but near the margin of, this depression (well removed from both the internal and terminal margin of the basal segment) the very minute, short, rounded rudiment of the external branch is placed. The internal branches are rather narrowly tapered and do not reach to the end of the last abdominal segment.

This species would appear to be common near Stanleyville, as the following specimens were collected. Females predominate among them; some have brood-pouches containing young.

Cat. No. 3267. Stanleyville, Aug. 29, 1909. 6 specimens.
Cat. No. 3257. Stanleyville, March 1915. 2 specimens. Female is type and male used in drawing figure.
Cat. No. 3244. Stanleyville, March 1915. 31 specimens.
Cat. No. 3258. Stanleyville, Aug. 10, 1909. 7 specimens.
Cat. No. 3300. Stanleyville, Aug. 4, 1909. 1 specimen from the stomach of a toad (*Bufo regularis*).
Cat. No. 3265. Bengamisa. Sept. 1914. 1 specimen.

## **Eubelum stipulatum** Budde-Lund

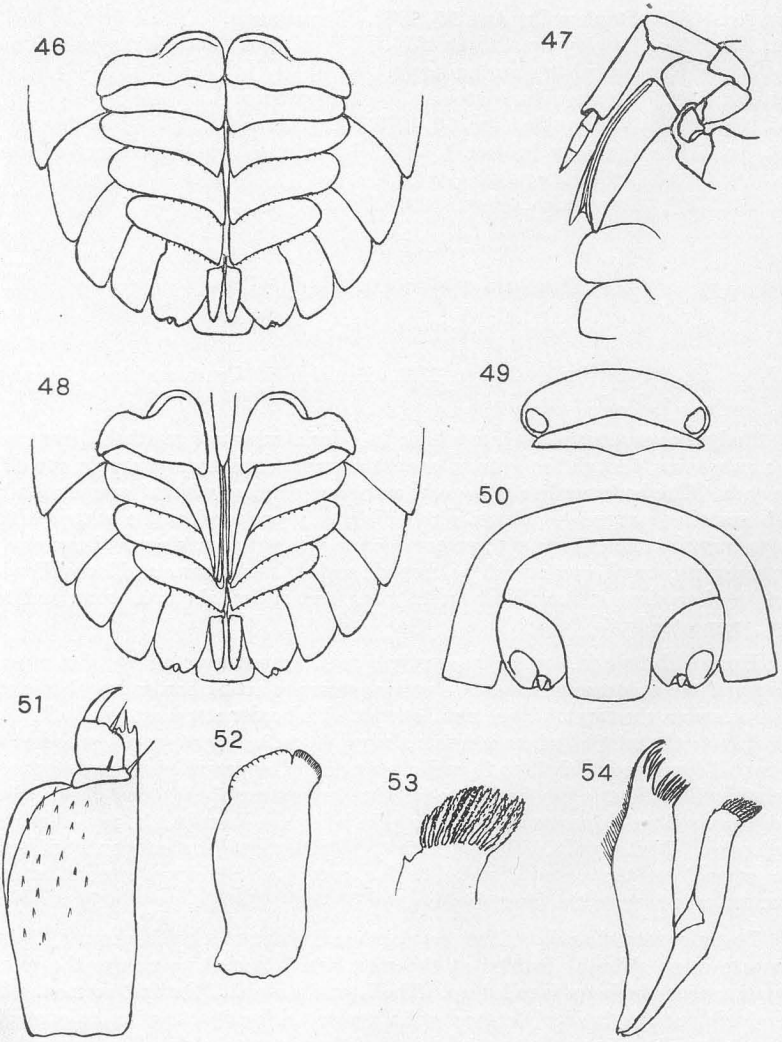
Text Figures 46 to 55

*Eubelum stipulatum* Budde-Lund, 1899, Revision of Crustacea Isop. Terrestr., (part 1), p. 71, Pl. 1, figs. 1–16.

Body convex, contractile into a ball; in a dorsal view not greatly different from *E. stanleyanum*, though the epimera are rather more squarely and evenly cut off at the ends. The body surface is smooth, even, and shining, without granulation but with scattered extremely minute pits visible only on considerable magnification. Color grayish brown above with rather obscure yellowish markings and margins on the segments; basal segments of the uropoda and the under parts and legs yellowish. Length of specimens: female, about 11 mm.; two males, about 9.5 mm. and 10.6 mm., respectively.

Head with its anterior outline evenly convex as seen from above; the superior margin of the epistome forms only a very narrow projecting border but this is continuous across the front. Seen from in front, this border slopes up gradually from the sides to the middle, where it forms a very obtuse and gently rounded off angle. Eyes well developed, with 22 to 25 ocelli. Antennæ of moderate length and stoutness; their fourth segment is less than three-fourths the length of the fifth and the flagellum is distinctly three-segmented, the first article being the shortest, the second slightly the longest. First maxilla with nine teeth (3+5 with a slender accessory tooth beside the second) on the outer division, and a row of about eleven closely crowded plumose processes on the inner division.

Posterior lateral angles of first segment somewhat produced backward, slightly truncate in an oblique direction at the apex, which is cleft to receive the second segment when the body is rolled up. The lateral margin of the first segment when seen from one side is evenly curved, with a wide thick projecting border extending along its length as far as the truncated part of the posterior angle. This border has a moderately wide and deep sulcus along its whole length; the sulcus is situated on its external aspect but is narrowly visible in a ventral view also. The whole projecting border is separated from the main part of the segment by a very deeply impressed groove. The inner side of the cleft posterior lateral angle is a little more produced ventrally (though scarcely more posteriorly) than the outer and, instead of being truncated, is rather sharply rounded off. Processes wanting on the inner surface of the lateral ends of the second and following segments; there is scarcely any thickening of their anterior margin. Legs of moderate length and stoutness, with rather few spines.




Figs. 46 to 54. *Eubelum stipulatum* Budde-Lund, 1899.
46. Pleopoda of female, × 10.5.
47. Antenna and outline of anterior segments, ventral view, × 10.5.
48. Pleopoda of male, × 13.2.
49. Outline of head, front view, × 9.
50. End of abdomen, posterior view, × 16.
51. Inner division of maxilliped, × 34.
52. Second maxilla, × 34.
53. Tip of inner division of first maxilla, × 85.
54. First maxilla, × 34.

The form of the pleopoda is shown in the accompanying figures; in the female the first two pairs are much more swollen and tracheate than the others. The terminal segment of the abdomen is broad and tapering, with concave sides; its end is broadly truncated, with a slightly convex outline and the corners a little rounded off. Uropoda with the exposed external surface very conspicuously convex; their outline is somewhat oval. The small external branch is borne in a notch lying chiefly on the external surface close to the terminal margin, which is a little indented. There is a fairly well-marked, shallow depression on the external surface between this notch and the outer margin. The inner branches do not reach to the end of the terminal segment of the abdomen.

Specimens collected:

Cat. No. 3264. Stanleyville, February 1915, one female.
Cat. No. 3262. Bengamisa, September 1914, one male.
Cat. No. 3302. Stanleyville, one male, found in the stomach of a toad (*Bufo regularis*) taken Aug. 4, 1909.

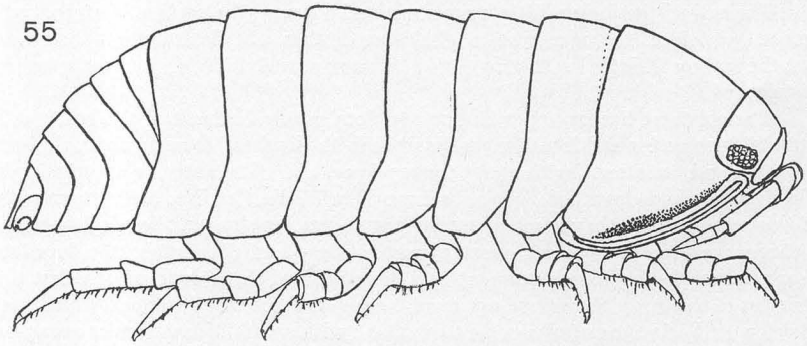



Fig. 55. *Eubelum stipulatum* Budde-Lund, 1899. Female, × 10.5.

Budde-Lund described this species from Bonge in Cameroon. His specimens were somewhat larger, 13 mm. to 15 mm. long, and had, according to his description and figures, more numerous ocelli (twenty-eight to thirty) and more plumose processes (thirteen) on the inner division of the first maxilla than the present examples, but otherwise the correspondence is so close that, in spite of the difference of locality, I am unwilling to describe the Congo Expedition specimens as new, especially as they may not have reached their full growth and size. Possibly they may eventually prove to be distinct, but the information and material now available do not appear sufficient to furnish satisfactory distinguishing characters.

This form is closely allied to *E. instrenuum* Lönnberg and Budde-Lund, 1912, from British East Africa, but in that species the margin of the first thoracic segment is described as scarcely sulcated ("vix sulcato").

Another nearly allied form is *E. lubricum* Budde-Lund, 1885, from Landana and Chinchoxo (Portuguese Congo), but that species is described as having the superior outline of the epistome partly effaced in the middle part of the head. (See also the next species.)

### **Eubelum propinquum,** new species

Text Figures 56 to 62

A rather large male specimen (Cat. No. 3271), 13 mm. long, of a slaty gray color above with rather conspicuous yellowish markings and margins on the segments, appears to differ specifically from the form just described under the name *E. stipulatum*, though exceedingly closely allied to it.

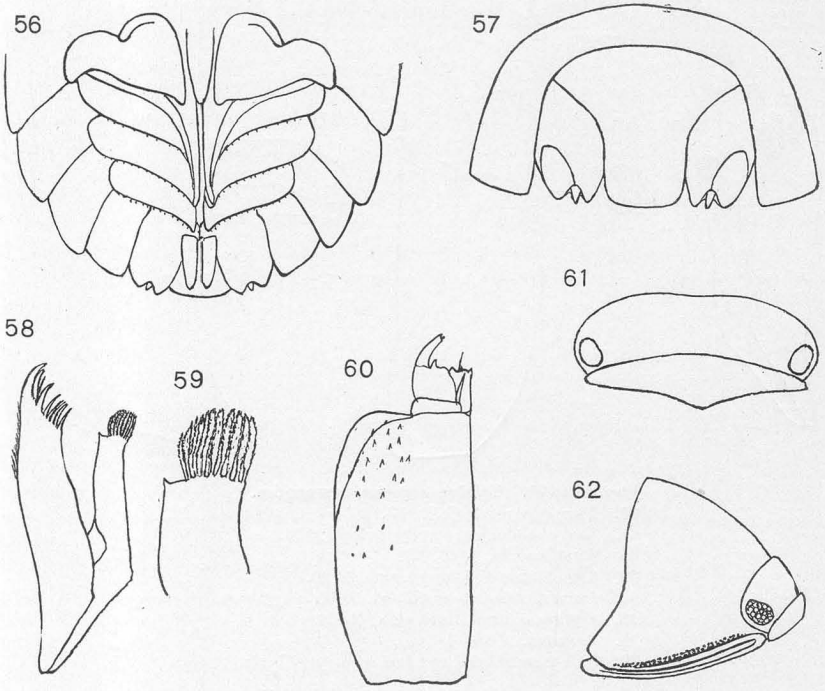
The body is perhaps a little more stout and convex; the surface is exceedingly smooth, considerable magnification disclosing neither granulation nor pubescence, but the surface is dotted with minute pits or punctures abundantly and quite evenly distributed.

The epistome has its upper border complete across the front of the head; it is but little projecting and is rather gently arched; the forehead is rather low; the eyes are large and prominent, with about twenty-five ocelli. The antennæ are missing in the specimen here described. (In a specimen from Medje, Cat. No. 3249, presumably of this same species, they are moderately long and rather slender, their fifth segment rather more than one and one-quarter times the length of the fourth; the flagellum nearly equal to the fourth segment and composed of three articles, the first the shortest of the three, the second not much longer than the terminal one.) The outer division of the first maxilla has nine teeth (3+5 with an additional slender accessory tooth beside the second); the inner division has eleven or more closely crowded plumose processes.

The first segment of the thorax has its posterior outer angles a trifle more produced backward than in the case of *E. stipulatum*, the outer side of the cleft ends in sharper posterior angle and the inner side is a little more produced backward than in that species. In a lateral view the lateral inferior outline of the segment is straighter (less convex downward); the thickened border is marked off from the main part of the segment by a narrower groove and is itself more conspicuously narrowed toward the rear; but these differences are slight and only noticeable on careful comparison. The legs are also more spiny than in that species; on the inferior aspect of the anterior pairs of legs the spines are so thickly distributed as to suggest a brush with short thick bristles.

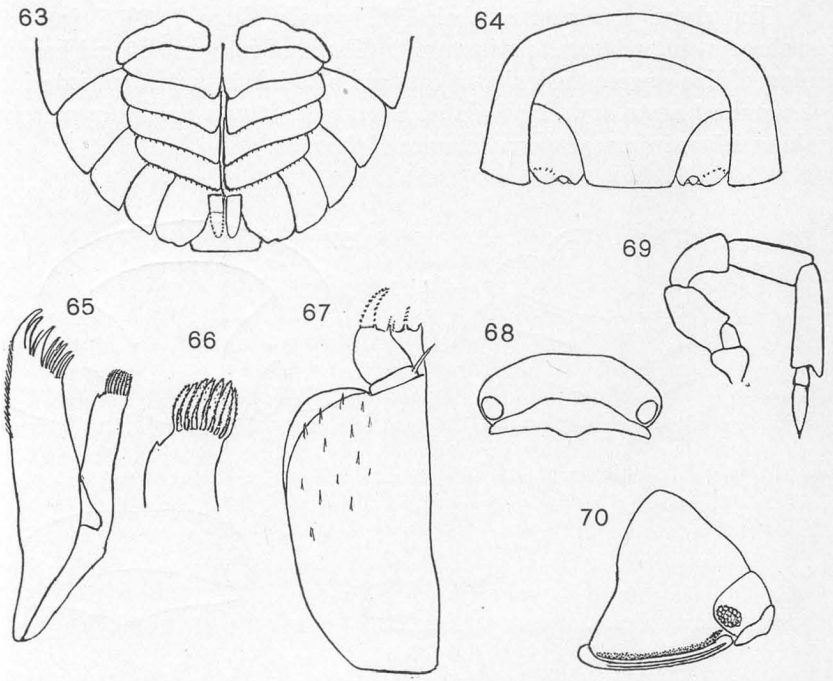
The abdomen and its appendages are also very similar to those of *E. stipulatum*. In the present form, however, the last segment of the abdomen is longer and narrower, with the sides of the central extension parallel instead of converging toward the end. The first pair of pleopoda are proportionately longer. The basal segments of the uropoda are more elongate and the rudimentary external branches also more elongate and proportionately longer and more conspicuous, and the oval depression on the external surface of the basal segment is larger and more elongate.

The above specimen is labeled "Thysville, June 2, 1915, from a mushroom-shaped termite structure." The hard integument and bright colors of this species show that it cannot be an inhabitant of the interior of termites' nests and, if the label is correct, it was probably merely taking refuge in some external crevice of the nest.




Figs. 56 to 62. *Eubelum propinquum*, new species.
56. Pleopoda of male, × 9.
57. End of abdomen, posterior view, × 13.
58. First maxilla, × 26.
59. Tip of inner division of same, × 65.
60. Inner division of maxilliped, × 26.
61. Outline of head, front view, × 10.
62. Side view of head and first segment of body, × 7.8.

Another specimen, alluded to above, (Cat. No. 3249), also a male but slightly smaller than the one described, labeled Medje, July 1914, is probably of this same species, but is in a rather poor state of preservation.




Figs. 63 to 70. *Eubelum asperius*, new species.
63. Pleopoda of female, × 12.
64. End of abdomen, posterior view, × 16.
65. First maxilla, × 46.
66. Tip of inner division of same, × 90.
67. Inner division of maxilliped, × 42.
68. Outline of head, front view, × 9.6.
69. Antenna, × 16.
70. Side view of head and first segment of body, × 8.5.

### **Eubelum asperius,** new species

Text Figures 63 to 70

The only specimen obtained is a female, 8.5 mm. long, with an empty brood-pouch. This species also very closely resembles *E. stipulatum*, described above, and the description there given will apply to this form also with the following modifications.

Body surface rougher, with small irregularly distributed roughened pits, easily visible with low magnification, closely distributed over the surface; they are slightly setose, giving the body surface a somewhat pubescent character. Ground color of upper parts rather light brown, lower parts and legs pale yellowish brown. There are the usual light markings and borders on the segments; the markings on the lateral parts of the back form more regular rows of short bars than they do in *E. stipulatum*.

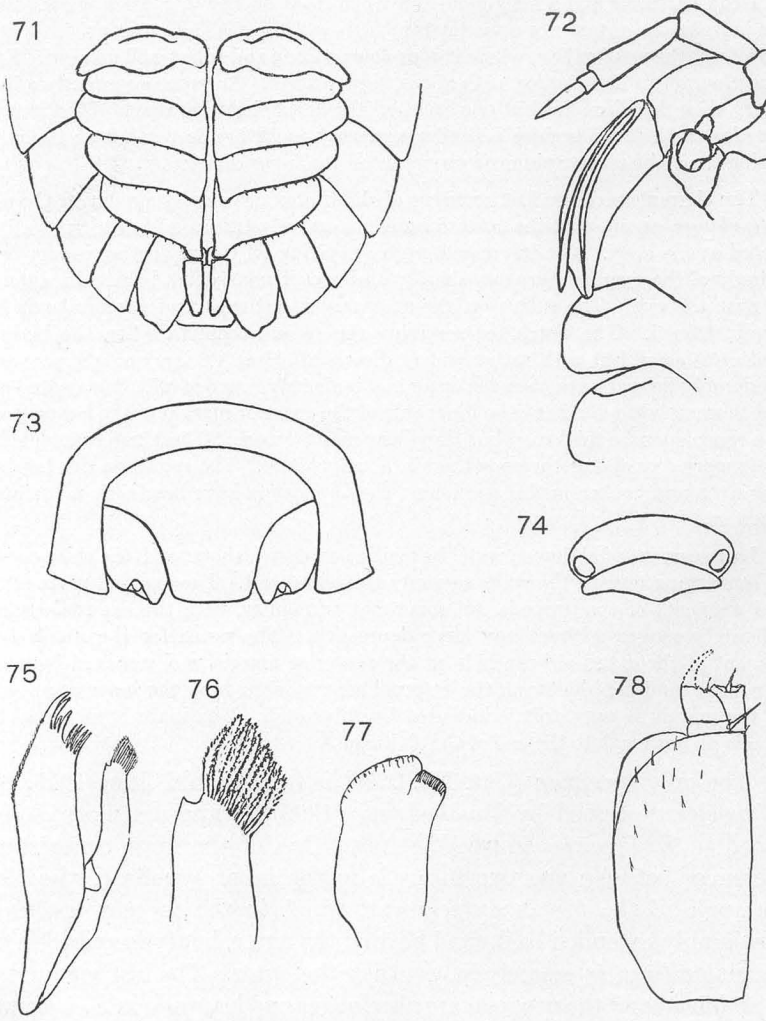
Head narrower and a little more convex in front outline in a dorsal view. Seen from in front, the anterior or upper margin of the epistome is highest at a point a little each side of the median line, where it dips down a little and is less well marked. Eyes proportionately a little larger, with about twenty ocelli. Antennæ apparently a little longer; their flagellum has but two articles,[1] the first being very short. First maxilla with nine teeth (3+5 besides a slender accessory tooth beside tooth 2 on the outer division) and about nine plumose processes on the inner division.

The characters of the first segment of the thorax are closely similar to those of *E. stipulatum*, except that the posterior angle is scarcely truncated but merely a little blunted at the apex. The impressed groove marking off the projecting border from the body of the segment turns up sharply and conspicuously just behind its anterior end near the eye. The sulcus on the external-ventral aspect of the border is less sharply defined. The notch for receiving the second segment when the body is rolled up is small but with rather widely divergent sides; its inner side is produced considerably farther back then the outer and is sharply rounded off. The second and third thoracic segments have the inner side of the anterior margin of the lateral parts quite conspicuously thickened but they bear no processes. These two segments are a little more rounded at the ends than in *E. stipulatum*. The spines on the legs are much worn and broken in this specimen; they appear to have been only moderately numerous.

Last segment of abdomen wide, its median extension short, with the sides curved and converging toward the wide, squarely truncated end. The exposed parts of the basal segments of the uropoda are somewhat triangular, with the external surface moderately convex without any large depression. The notch for the small short rudiment of the external branch is on the posterior margin well removed from the inner angle, and lies chiefly on the external aspect; seen from the inner or anterior side the margin is only a little indented by this notch. The inner branches of the uropoda do not reach to the end of the abdomen.

The only specimen (Cat. No. 3256) is from Zambi, June 1915. Of the species described by Budde-Lund (1899), it appears most closely related to *E. ignavum* from Abyssinia. One of the most conspicuous differences between the two forms is in the inner lamella of the cleft rear angle of the first body segment, which in the present species is considerably extended backward beyond the outer, but is described in the Abyssinian form as scarcely longer than the outer. The last segment of the abdomen and the uropoda are also longer and less wide in *E. ignavum*. *E. instrenuum* Lönnberg and Budde-Lund, 1912, from British East Africa appears to resemble this species in many characters but has the flagellum of the antennæ composed of three articles.

[1]Though in some groups the number of articles in the flagellum is a reliable character for generic or subgeneric distinction, in *Eubelum* and probably also in some other sections of the Oniscidæ the character seems to be of less importance, a two-segmented flagellum having apparently developed independently in species not closely related by a coalescence of the two terminal articles.




Figs. 71 to 78. *Eubelum garambæ*, new species.
71. Pleopoda of female, × 18.
72. Antenna and outline of anterior segments, ventral view, × 22.
73. End of abdomen, posterior view, × 25.
74. Outline of head, front view, × 10.
75. First maxilla, × 44.
76. Tip of inner division of same, × 130.
77. Terminal part of second maxilla, × 44.
78. Inner division of maxilliped, × 44.

**Eubelum garambæ,** new species

Text Figures 71 to 79

This species is represented by but one specimen, a female only about 7 mm. long, with marsupial plates developed. It is closely related to *E. stipulatum* and even more closely to *E. asperius*, but the body, though very convex, is a little narrower than in either of those species.

Surface even but with minute, not very closely distributed punctæ and with considerable pubescence. The thoracic segments have a considerable degree of individual convexity in an antero-posterior direction; the part overlapped by the preceding segment is marked off by a rather conspicuous depressed line or furrow. Color grayish brown above, with obscure yellowish markings and margins on the segments; under parts yellow.

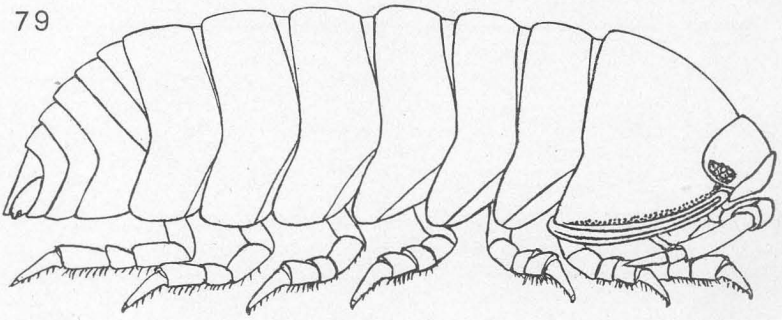
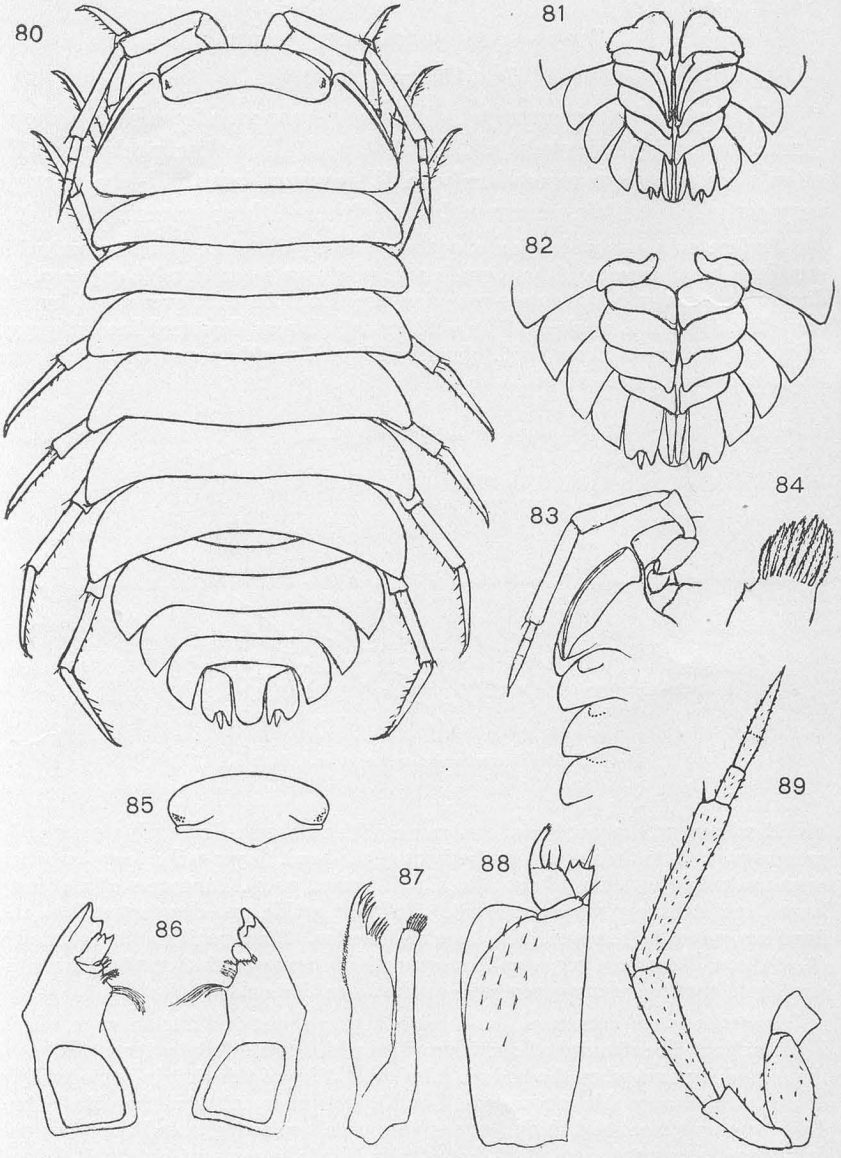



Fig. 79. *Eubelum garambæ*, new species. Female, × 15.

Head narrow, superior line of epistome considerably arched and only very slightly prominent, but continuous across the front of the head. Eyes rather large but with comparatively few ocelli (about fifteen well-formed ones). Antennæ of moderate length and stoutness, very pubescent. No third article was demonstrated in the flagellum, which is, however, fairly long and slender. First maxilla with eight teeth (3+5), in addition to a very small accessory tooth beside tooth 2 on the outer division, and about ten plumose processes on the inner division.

Posterior lateral corners of first thoracic segment produced into an angle, which is not truncated or rounded off and is provided with a small cleft for the reception of the second segment when the body is rolled up. Sides of this cleft only moderately divergent, the inner side is rounded off and a little more extended than the outer. There is a prominent and thick, but not very wide, projecting lateral border on the first thoracic segment marked off from the body of the segment by a well-defined furrow. The border and furrow extend almost to the posterior angle of the segment but the border becomes narrow and inconspicuous before the angle is reached. There is a wide and fairly deep sulcus the whole length of the border on its external ventral aspect, the sulcus widens noticeably in the posterior third of its length. The lateral parts of the second and third thoracic segments have the anterior border




Figs. 80 to 89. *Eubelum tenebrarum*, new species.
80. Female, × 11.
81. Pleopoda of male, × 11.
82. Pleopoda of female, × 11.
83. Antenna and outline of anterior segments, ventral view, × 11.
84. Tip of inner division of first maxilla, × 115.
85. Outline of head, front view, × 11.
86. Mandibles, anterior aspect, × 32.
87. First maxilla, × 32.
88. Inner division of maxilliped, × 34.
89. Antenna, × 24.

thickened on the inner surface but bear no processes. Their ends are rather narrowly and sharply rounded and the ends of the remaining thoracic segments are less abruptly truncated than in *E. stipulatum*. The legs are of moderate length and rather slender; their spines are not very numerous but fairly stout. The abdomen is rather narrowly rounded behind, the ends of the segments bend or flare outward a little. The last segment is as in *E. asperius* but narrower and longer, and less broadly truncate at the end. The basal segments of the uropoda have the exposed parts somewhat triangular; their terminal border is quite oblique, the inner angle being much more produced than the outer and exceeding a little the tip of the abdomen. The notch for the short rounded rudiment of the external branch lies in the posterior border but mostly on the external aspect. Seen from the anterior or inner side, the posterior border is scarcely indented. The external surface of the basal segment of the uropoda is only moderately convex and has no large depression. The inner branches of the uropoda are rather stout; they do not reach to the end of the abdomen.

The only specimen (Cat. No. 3260) is from the extreme northeastern part of the Congo region, Garamba, collected in March 1912.

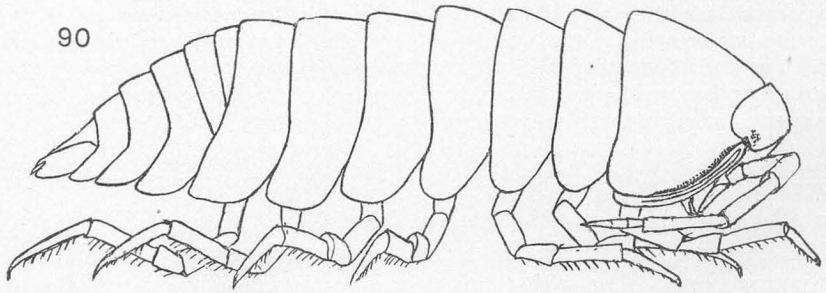



Fig. 90. *Eubelum tenebrarum*, new species. Female, × 11.

**Eubelum tenebrarum,** new species

Text Figures 80 to 90

Body moderately wide and of oblong outline when seen from above; rather soft and quite loosely articulated; the lateral ends of the segments slightly extended. The back is not very convex; its surface is smooth but not shiny; punctate under magnification, but not pubescent. Color in alcohol dull yellowish white (white in life according to notes taken by the collector). Size of a large female, 8.7 mm. long by 4.3 mm. wide; the males are smaller, a large one measuring 6.8 mm. long by 3.4 mm. wide.

Head small; its anterior outline nearly straight in the middle, though receding toward the corners. The superior margin of the epistome forms a projecting border only near the sides; in the middle part the line of demarkation disappears. Mouthparts forming a prominently projecting mass. First maxilla with eight teeth (3+4 with an additional accessory tooth beside the second) on the outer division; the inner division bears a row of about eight plumose processes. Antennæ very long and slender; the flagellum long, of two distinct articles of which the last is about two and

one-half times the length of the first. In some individuals a very obscure segmentation of the second article into two was demonstrated; in others I could not detect it. Eyes very small and imperfect, with indistinct ocelli and very little pigment.

First segment of thorax with a moderately thick, but rather narrow, projecting border separated from the main part of the segment by a narrow deeply impressed groove. The border, which extends about four-fifths of the length of the margin, has a fairly well-marked sulcus along its external aspect. This sulcus is slightly obliquely situated so that it is somewhat visible from a ventral direction also, especially toward the posterior end. The posterior lateral angle of the segment is rounded off in a small curve and has a small cleft to receive the second segment; the outer side of the cleft extends a little farther back but not so far ventrally as the inner. The front margin of the epimera of the second, third, and fourth segments is thickened on the inner side but none of them bear any process. The thoracic segments are somewhat rounded at the ends, especially in the anterior part of the body. The legs are rather long, quite slender, and rather weak.

The epimera of the third, fourth, and fifth abdominal segments end in rather sharp, backwardly directed angles. The last segment has a wide but very short base, the median extension has nearly parallel sides and a very rounded extremity. The basal segments of the uropoda are deeply notched on the posterior margin; these notches are occupied by the outer branches which, though small, are elongate and sharp pointed; they are visible both in a dorsal and ventral view of the body. The inner branches are long and tapering; they lie beneath the median part of the last segment, extending to its end.

About sixty specimens (Cat. Nos. 3242 and 3266) of this species were collected at Thysville, June 2, 1915, "from the shelves of a cave" which is described in Bull. Amer. Mus. Nat. Hist., XXXVII, p. 541. A few of the females have a brood-pouch developed, containing a few large eggs. The rather soft, loosely articulated body, the lack of pigmentation and the almost functionless eyes are modifications that would be expected in a form inhabiting such a cave as that in which this species lives. These modifications are, however, of a very superficial kind, and in the form and structure of its parts there seems to be no sufficient reason for placing it elsewhere than in the typical subgenus of *Eubelum*.

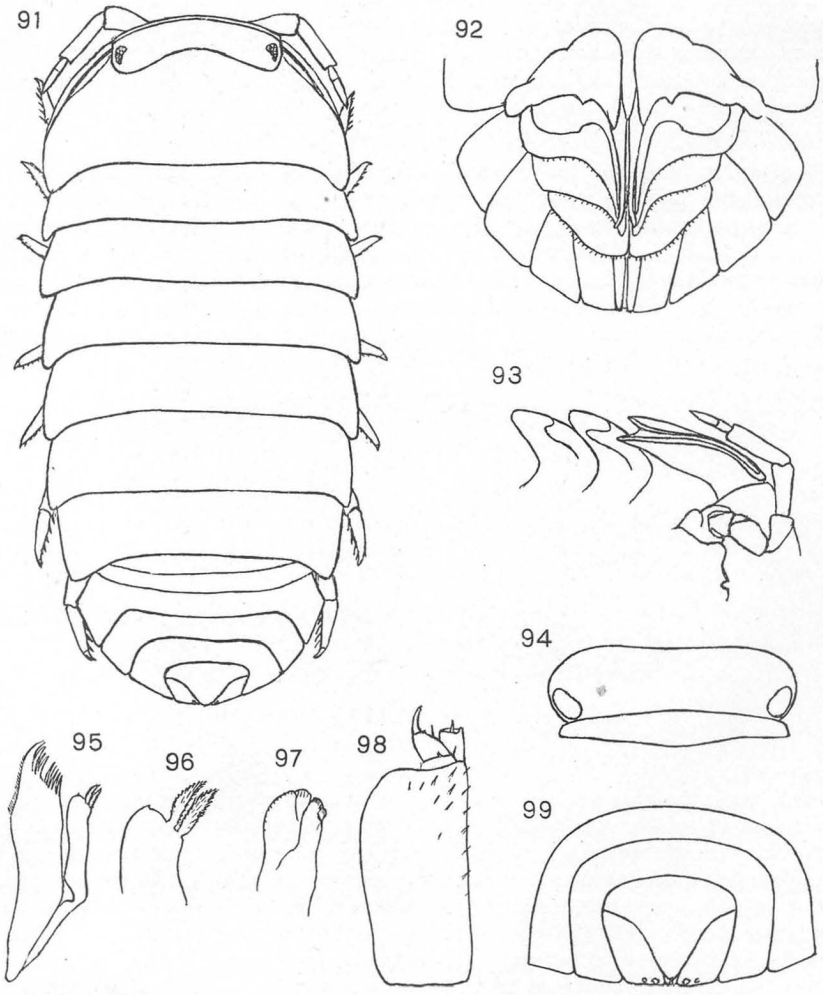
## **Oniscinæ** (=Oniscidæ *auct. mult.*)

### **Synarmadillo globus** Budde-Lund

Text Figures 91 to 100

*Synarmadillo globus* Budde-Lund, 1909, in Voeltzkow, Reise in Ostafrika, II, p. 276, Pl. xiii, figs. 37–44.

Body broad in proportion to its length; back very convex; front outline of head strongly and evenly convex; rear end of body rather broadly rounded. Articulation very compact and smooth; body surface unusually smooth, showing under considerable magnification only very minute and even granulation and numerous depressed




Figs. 91 to 99. *Synarmadillo globus* Budde-Lund, 1908.
91. Male, × 6.
92. Pleopoda of male, × 7.2.
93. Antenna and outline of anterior segments, ventral view, × 6.
94. Outline of head, front view, × 9.
95. First maxilla, × 20.
96. Tip of inner division of same, × 50.
97. Terminal part of second maxilla, × 20.
98. Inner division of maxilliped, × 20.
99. End of abdomen, posterior view, × 7.2.

dots or punctæ. Color dark slaty gray above, the segments marked and bordered with pale yellow, the under parts and legs also pale yellow. This is the largest and most conspicuously marked terrestrial isopod collected by the Expedition; the single specimen obtained, though a male and hence doubtless considerably inferior to adult females in size, would measure nearly, if not quite, 15 mm. long if straightened out, and its stoutness and highly convex back give it unusual bulk for its length.

Head rather small, the superior border of the epistome forming only a very narrow projecting border, but this extends completely across the front of the head. Eyes proportionately small, with about twenty-two ocelli; antennæ rather short and small, the fourth and fifth segments nearly equal in length, the flagellum with only two articles, the basal about half as long as the terminal one. The mandibles are more elongate and less crooked than in the next species (*Synarmadillo lubilensis*). The first maxilla has nine teeth (4+5, two of these representing enlarged accessory

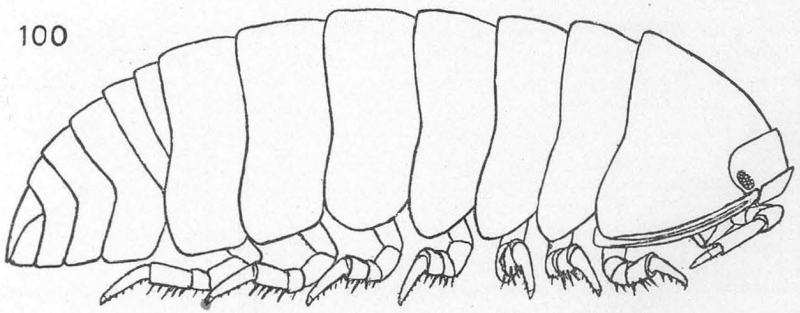



Fig. 100. *Synarmadillo globus* Budde-Lund, 1908. Male, × 7.

teeth beside the main row) on the outer division, and two plumose processes and a very minute spine on the inner division. Seen from one side, the lateral margin of the first thoracic segment is curved, especially in the posterior part; its posterior angle is cleft to receive the second segment when the body rolls up. The outer side of this cleft is less produced downward and backward than the inner; the latter forms a rather sharp angle. The whole length of the margin, almost to the extreme rear angle, is turned outward to form a thick but narrow projecting border of even width. This border turns sharply out from the main part of the segment, thus forming a fairly distinct line of demarkation but there is no impressed groove along that line. The border has a sulcus along its whole length; the sulcus lies on the external inferior aspect and is rather narrow, widening, however, somewhat rapidly a little way before the cleft at the rear angle is reached.

Second segment of thorax with a short process on the inside of the lateral part; third segment with a slight rudiment of a process. The second to fourth thoracic segments inclusive have the ends somewhat angular, though a little rounded off, and not produced beyond the general outline of the body; the fifth has the ends broadly rounded; the sixth and seventh are rather squarely cut off. Legs rather long; they have few but stout spines.

This species differs from all related forms collected by the Expedition in having the last segment of the abdomen taper to a slightly rounded triangular point, which, however, is not quite long enough to equal the truncated ends of the basal segments of the uropoda that fill in the outline of the body on either side of it. The external branches of the uropoda are represented by an exceedingly minute rounded rudiment borne on the external aspect of the basal segment close to, but a little above, the terminal margin (which is not indented) and near the inner corner. Just external to the rudimentary external branch there is a minute pore or pit filled with a yellow substance. The internal branches are long and slender and reach a trifle beyond the triangular tip of the last abdominal segment.

The only specimen (Cat. No. 3243) was collected at Zambi in June 1915. It corresponds well with Budde-Lund's description and figures. His specimens were from Cameroon (Bibundi and Bonge), collected by Dr. Y. Sjöstedt in November 1891.

### **Synarmadillo lubilensis,** new species

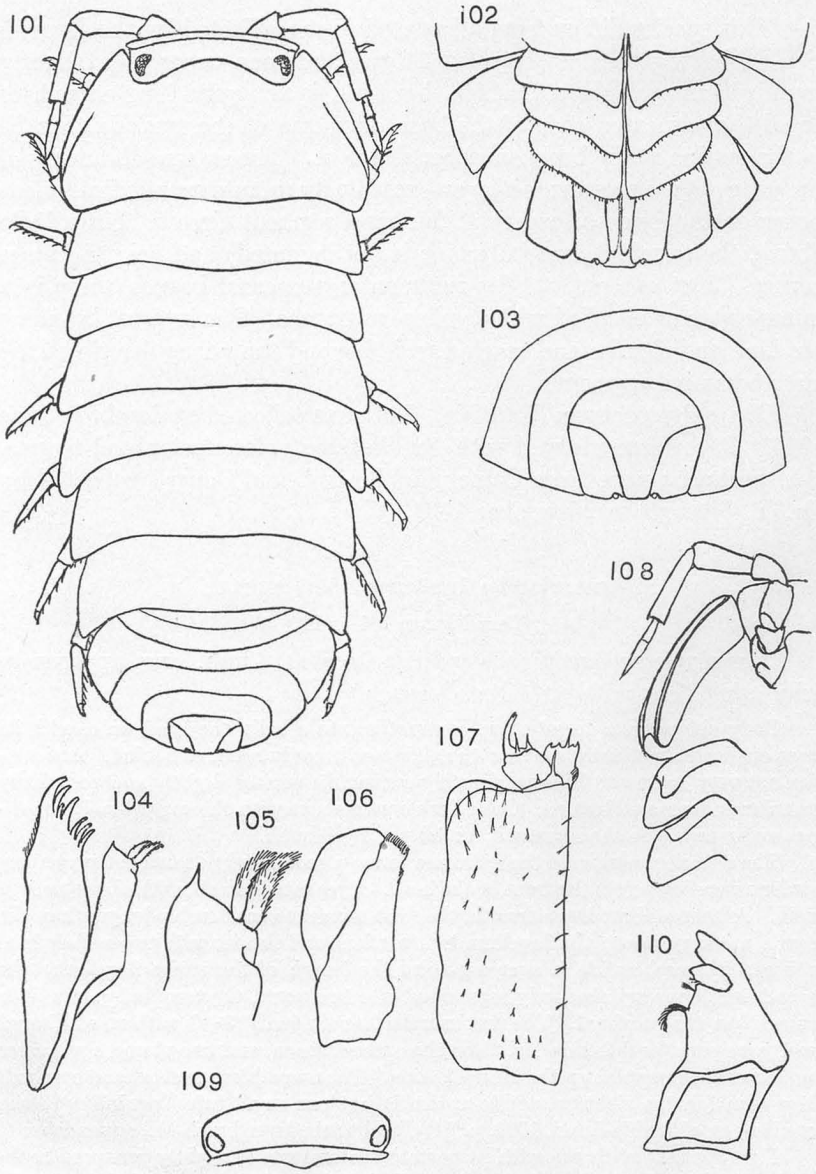
Text Figures 101 to 110

The single specimen collected is a female, 13 mm. long, apparently fully adult, but without a brood-pouch.

Body oblong in a dorsal view, contractile into a ball; the head wide, with its front outline only slightly convex; the abdomen broadly rounded behind. Articulation not very compact; back moderately convex, its surface slightly and very finely granular under magnification. Color dark brown above with obscure yellowish markings and margins on the segments; under parts yellowish.

The anterior margin of the epistome forms a moderately prominent projecting border extending across the front of the head. Eyes rather small, with about twenty ocelli. Antennæ of moderate length, the fifth segment considerably longer than the fourth, not very stout; the flagellum is rather long and slender with two well-defined articles; its basal article is over one-third the length of the entire flagellum; the second article is very obscurely segmented into two parts, the terminal part a little longer than the proximal. The first maxilla has six teeth (3+3, with an additional small accessory tooth beside No. 2) on the outer division, and two plumose processes and a conspicuous spine on the inner division. The mandibles are short and crooked; they have (on the right mandible at least) but one small tuft ("penicillus" in the terminology of Budde-Lund, 1909, p. 54) distal to the large brush-like appendage.

First segment of thorax with its posterior lateral angles slightly produced backward and rounded off; there is a very small cleft to receive the second thoracic segment when the body is rolled up; the inner side of the cleft is considerably less produced than the outer. Seen from one side, the lateral margin of the first thoracic segment is nearly straight: its border is thin, widely projecting and, especially in the anterior part, considerably turned or rolled upward; there is no groove separating the




Figs. 101 to 110. *Synarmadillo lubilensis*, new species.
101. Female, × 7.2.
102. Pleopoda of female, × 9.6.
103. End of abdomen, posterior view, × 9.6.
104. First maxilla, × 27.
105. Tip of inner division of same, × 66.
106. Second maxilla, × 27.
108. Antenna and outline of anterior segments, ventral view, × 7.8.
109. Outline of head, front view, × 7.8.
110. Right mandible, anterior aspect, × 27.

border from the body of the segment. On the inferior aspect of the edge of the segment (scarcely visible in a lateral view) there is a broad shallow sulcus (rather deeply and sharply impressed along its inner margin and poorly defined along its outer margin) that extends along the whole length of the border of the segment and is continuous behind with the above-mentioned cleft for the reception of the second segment. Lateral ends of the second to fourth thoracic segments somewhat rounded off at the corners; those of the succeeding segments are more squarely cut off. Second segment with a thickening or infolding of the anterior margin of the epimeral part of the segment. This thickened part is produced at the end into a very slightly projecting rudiment of a process. The third segment has the margin a little thickened but not at all produced. The legs are moderately long and rather slender, their spines rather few and weak.

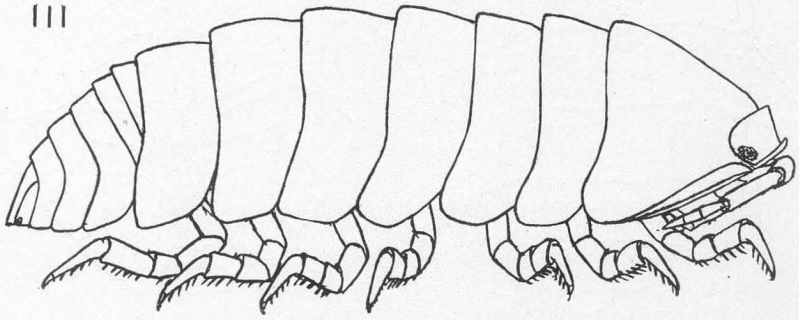


Fig. 111. *Synarmadillo lubilensis*, new species. Female, × 8.

Last segment of abdomen T-shaped; its median part is narrow and rather elongate, with straight sides which converge toward the narrow truncated end. The exposed parts of the basal segments of the uropoda are obliquely quadrangular and rather narrow and elongate, with straight sides which converge toward the truncated end. They have a minute notch directly on the posterior margin, close to its inner corner for the very small and short rudiment of the outer branch.

The inner branches are long and narrow and slightly tapered, they reach almost to the end of the terminal segment of the abdomen.

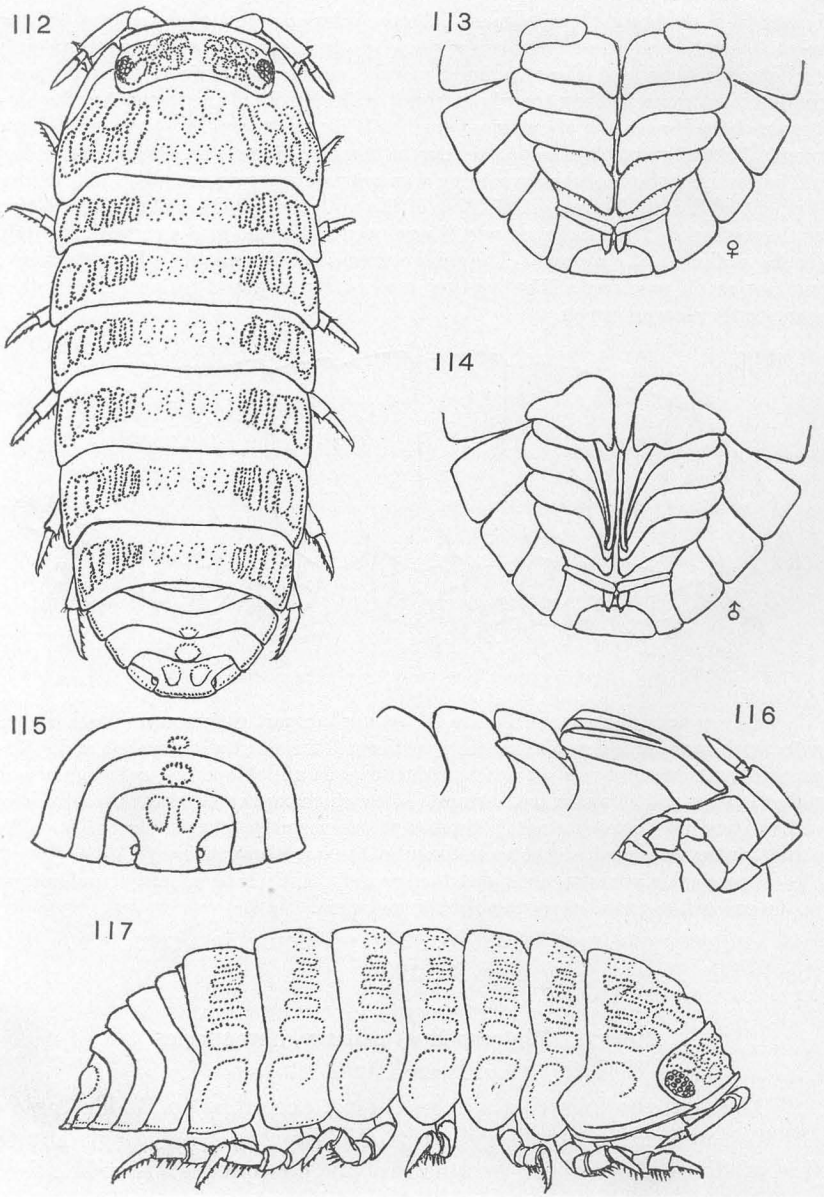
The only specimen (Cat. No. 3259) was found in a termite's nest at the Lubila River, September 20, 1909.

### **Cubaris**[1] (**Diploexochus**) **bananæ,** new species

Text Figures 112 to 117

This and the following species belong, according to Budde-Lund's (1909) classification, in the subgenus *Diploexochus*. While agreeing to this subdivision of *Cubaris* as a natural one, the question may be raised

[1] *Armadillo* Latreille, 1804, commonly used as the generic name of this group is, as pointed out by Stebbing (1902, p. 650), antedated by *Armadillo* Brisson, 1762, syn. of *Dasypus*, a genus of mammals, and is therefore absolutely excluded. *Cubaris* Brandt, 1833, seems to be the next available name and is here used in a comprehensive sense for the entire genus. If used as a subgeneric name, *Cubaris* must, therefore, be employed for the typical Old World section of the genus.




Figs. 112 to 117. *Cubaris bananæ*, new species.
112. Female, × 16.
113. Pleopoda of female, × 27.
114. Pleopoda of male, × 27.
115. End of abdomen, posterior view, × 27.
116. Antenna and outline of anterior segments, ventral view, × 18.5.
117. Female, × 16.

as to whether Budde-Lund was correct in using the name *Diploexochus* for it, since that was originally applied by Brandt (1833, p. 192) to an American species (*C. echinatus*) which may prove to be subgenerically distinct from the African forms.

Body rather compactly articulated, ovate oblong as seen from above, widest at the posterior end of the first segment of the thorax. The anterior end of the body is broadly rounded, the posterior end has the outline of a rather narrow ellipse. Back highly arched. Surface, when seen under considerable magnification, very slightly granular and with a trace of pubescence. In addition to this minute granulation the dorsal surface is raised into low elevations, though these are slight and poorly defined. Along the middle part of the back these are mostly of rounded form and are very low and inconspicuous; a group of three on the fore part of the first segment, single median ones on the fourth and fifth abdominal segments, and a pair on the last abdominal segment being the most prominent. Along the sides of the thorax they are of oblong form and are more prominent. There are about six of these on each side of each segment. The lateral ends of the posterior thoracic and of the abdominal segments turn or flare slightly outward at the extreme edge. Color in the best preserved examples gray or grayish brown; the segments with a narrow yellowish or pale border and yellowish markings, which in many cases correspond more or less closely in situation and extent with the above described elevations of the surface. The specimens are all of small size; the largest, could it be straightened out, would hardly measure over 5.3 mm. long by 2.1 mm. wide. They may not have reached their full size but do not have the appearance of being young. Except the usual differences in the pleopoda (see Figs. 113, 114), no sexual differences were made out.

Head proportionately large; its front outline gently arched with a well-developed projecting border. Antennæ short but moderately stout. Their flagella consist of two quite closely joined articles of which the first is very short. Eyes large, with about fifteen ocelli.

Lateral margin of first thoracic segment turned outward to form a fairly wide projecting border, but this is not separated from the body of the segment by any distinctly defined groove. The lateral edge is not thickened; on its ventral aspect there is a well-marked sulcus on the posterior half; this narrows gradually and closes completely just in front of the middle of the segment. There is a small cleft (to receive the anterior margin of the second segment when the body is rolled up) at the posterior lateral angle of the first thoracic segment, which is conspicuously prolonged backward and broadly truncated with the corners a little rounded off. The inner side of the cleft extends backward fully as far as the outer side. The second to fourth segments inclusive are rather short; their lateral ends are not much extended backward and are rather narrowly rounded off; only the second bears a process on the inner aspect of the lateral part. This process is, however, quite long, though narrow, and is directed obliquely posteriorly and ventrally. The last three thoracic segments are longer than the three preceding ones; the lateral ends of the last two are somewhat squarely truncated. The legs are fairly large and stout and bear few spines.

The first segment of the abdomen is nearly (in some positions of the body entirely) concealed. The last segment is about two-thirds as long as it is wide and is considerably contracted in the middle part; its truncated end is a little more than half the width of the upper part of the segment. The inner branches of the uropoda

(visible only from below) are short and thick and extend but a little way down the inner aspect of the terminal abdominal segment; the outer branches are represented by very minute oval rudiments on the inner margin of the outer aspect of the broad basal segments of the uropoda, close to the constricted part of the last abdominal segment.

Specimens collected:

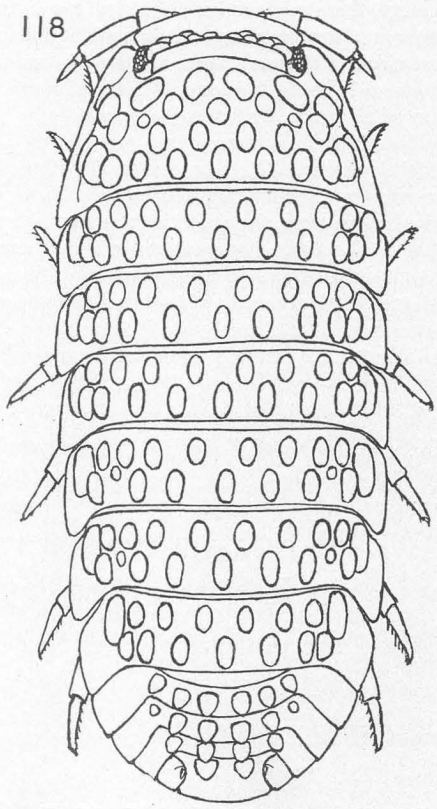
Cat. No. 3270. (Type) Banana, July-August 1915.
Cat. No. 3268. (Paratypes) Banana, July-August 1916, 9 specimens.
Cat. No. 3269. Zambi, June 1915. One male.

From two small species of this group which would seem from the descriptions to be of somewhat similar appearance, *C. bituberculatus* and *C. nanus*, described by Budde-Lund (1910) from the region of Mt. Kilimanjaro, East Africa, this form is distinguished by many minor characters—from the former, among other differences, by not having the sulcus on the inferior margin of the first segment extending the whole length; from the latter by the outline of the rear margin of the first segment, which in that species is described as "subrectus, utrinque ad angulos laterales levissime incurvus." In the present species the rear margin makes a considerable angle above the conspicuously produced lateral corners. *C. liliputanus* (Dollfus), 1895, from Pretoria, Transvaal, is another allied form, but it has a longer sulcus on the first segment, the outer branches of the uropoda less rudimentary, and the terminal abdominal segment more constricted.

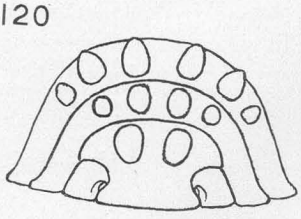
### **Cubaris (Diploexochus) regulus,** new species

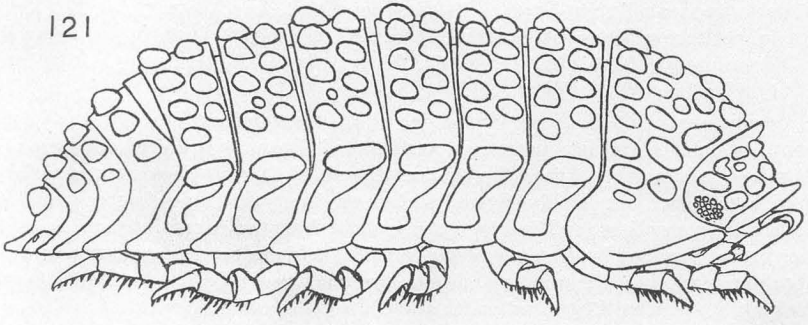
Text Figures 118 to 121

In spite of its very different appearance, due to the great development of the ornamentation of the dorsal surface, this species differs little from that last described in general form and in the details of its appendages. The largest specimen (both of the two good specimens available are females) slightly exceeds in size any of those of *C. bananæ*, although if it could be fully straightened out it would hardly measure over 6 mm. long. Such differences in the general form of the body as exist are due chiefly to the lateral ends of the segments being more squarely cut off and turning or flaring outward in a horizontal direction very much more than in *C. bananæ*. Antennæ short and small, their flagellum with two articles. Eyes with about fourteen ocelli. The outline of each side of the first thoracic segment is nearly straight when seen in a dorsal view. The sulcus on the ventral aspect of the lateral border of this segment is scarcely at all developed. There is only a small cleft to receive the second segment when the body is rolled up; the outer side of this cleft is extended backward considerably more than the inner and it is rather widely truncated in an oblique direction. Second thoracic segment with a backwardly directed, tapering process on the inner side of the lateral part; the third segment has no process. The legs have some of their segments, especially the carpus, somewhat swollen or expanded dorsally. Color in alcohol grayish above, with the summits of the tubercles and borders of the segments, as well as the legs and under parts, light yellowish.








Figs. 118 to 121. *Cubaris regulus*, new species.
118. Female, × 17.5.
119. Antenna and outline of anterior segments, × 24.
120. End of abdomen, posterior view, × 24.
121. Female, × 17.5.

Dorsal surface ornamented with large, highly elevated tubercles regularly arranged. They are mostly of more or less conical form with an oval base and rounded summit. In addition there is a transverse ridge at the posterior margin of the head, and near the lateral ends of the second to seventh thoracic segments there is on each side a large oblong ridge from which a curved elevation, less raised, extends down on the epimeron. The above tubercles are in addition to a conspicuous granulation of the surface; these minute granules are slightly setose. The tubercles are distributed on the head chiefly in two transverse rows; on the first thoracic segment in four rows; on the remaining thoracic segments in two rows, the posterior row having an odd number (seven or nine) and hence a median tubercle, the anterior row eight, none being median. The abdominal segments bear tubercles in one transverse row as follows: the first two, none; the second and third, six each; the fourth, four; the last segment, two. The pleopoda and uropoda differ scarcely at all from those of the last described species, though the rudiment of the external branch of the uropoda is larger.

Two females, Cat. No. 3251 (the larger one the type) were collected at Stanleyville in March 1915, with specimens of *Eubelum propinquum*. Another specimen (Cat. No. 3301), in poor condition, was found in the stomach of a toad (*Bufo regularis*) collected at Avakubi, Oct. 2, 1909.

This form is related to *C. formicarum* (Budde-Lund), 1909, p. 57, Pl. v, figs. 44–56, from South Africa, but the figures show, among other differences, that the terminal segment of the abdomen and the uropoda are much more elongated in Budde-Lund's species than in the present one.

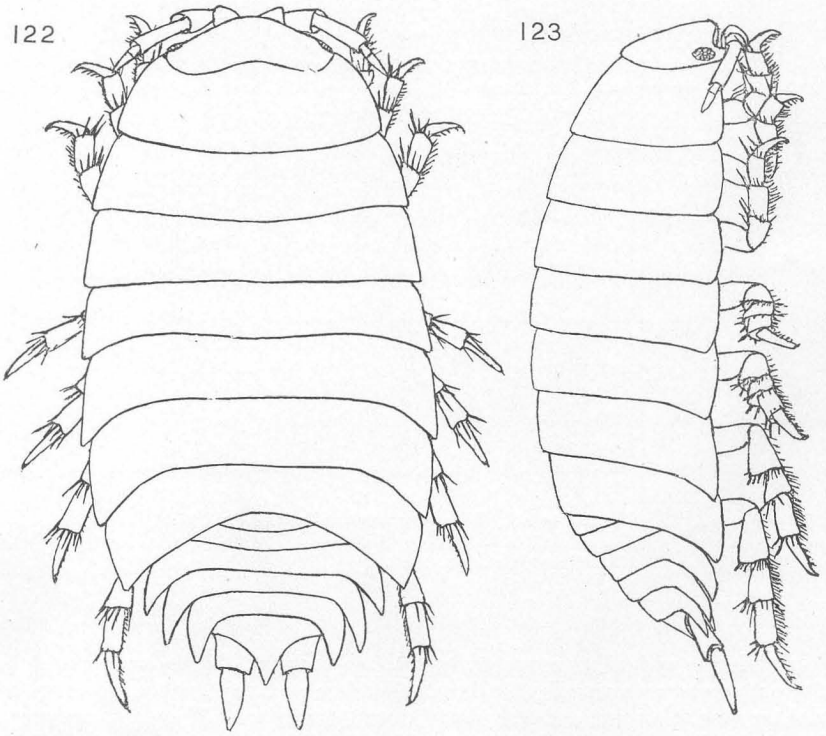
### **Niambia squamata** (Budde-Lund)

Text Figures 122 to 126

*Porcellio* (*Leptotrichus*) *squamatus* BUDDE-LUND, 1885, Crust. Isop. Terrestr., p. 196.
*? Leptotrichus squamatus* DOLLFUS, 1898, Bull. Soc. Zool. France, XXIII, p. 125.
*Niambia squamata* BUDDE-LUND, 1904, Revision Crust. Isop. Terrestr., p. 37; 1908, in Voeltzkow, Reise in Ostafrika, II, p. 280, 295; 1909, in Schultze, Ergebn. Forschungsr. Südafrika, II, p. 60, Pl. VI, figs. 1–3. STEBBING, 1910, Ann. South African Mus., VI, p. 441.

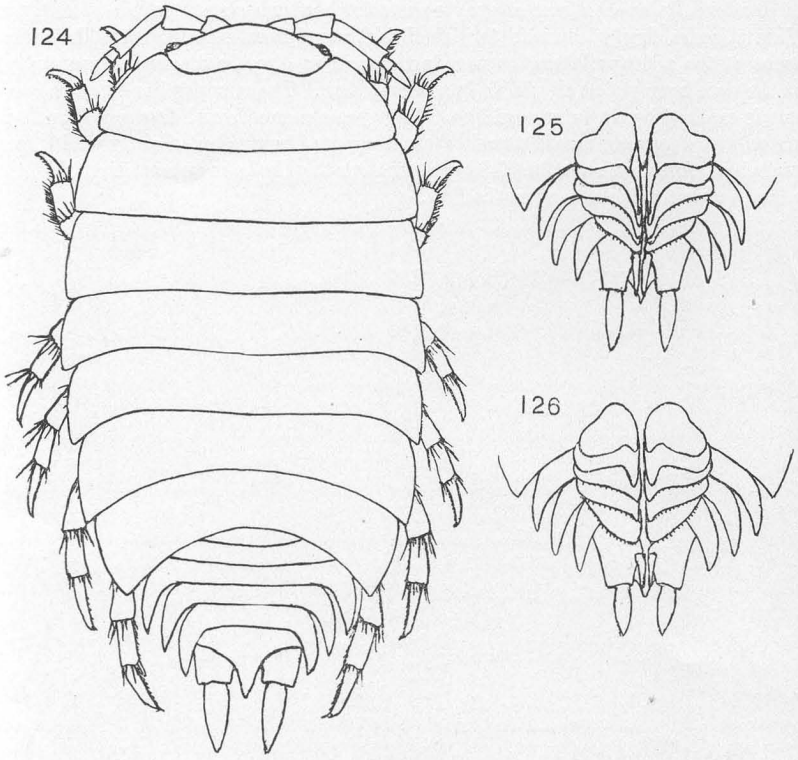
Body as seen from above very wide; the general outline broadly rounded in front and behind; it is fairly compactly articulated; both the head and abdomen are short and moderately set into the thorax. The back is quite convex; the surface smooth and even, but thickly covered with small evenly distributed setose granules. Color slaty gray above, with inconspicuous yellowish markings on the lateral areas of the thorax; legs and lower parts yellowish. The animal does not appear to be able to roll up into a ball. In the single female specimen the body broadens posterior to the middle, reaching its greatest width about the end of the fifth segment; in the two male specimens the outline seen from above is more oblong, with sides more nearly parallel. The female also has the back more strongly convex. Size of female (not fully adult), 5.6 mm. long by 3 mm. wide; largest male, 7.2 mm. long by 4.1 mm. wide.

Head small; as seen from above its posterior border is sinuous, while its anterior outline appears simply convex; two small but very prominent lobes are, however, present at the anterior lateral corners but extend so directly downward (ventrally) that they are barely if at all visible in a dorsal view. The superior border of the epistome is marked by an impressed line. The eyes are small, with few ocelli, and are situated just above the small lateral lobes; they are likewise but slightly visible in a dorsal view. Antennæ short but fairly stout; their flagella have two articles, of which the last is about twice as long as the first.




Figs. 122 and 123. *Niambia squamata* (Budde-Lund), 1885. Female, × 15.

The first thoracic segment is considerably the longest; the fourth and seventh are noticeably shorter than the others. Their lateral ends are cut off almost squarely, but the corners of the first two are rounded off and the posterior corners of the last four or five are produced a little backward, the posterior ones to the greatest extent. Legs moderately long and stout (the anterior ones shorter), with sharp, moderately long claws and numerous rather short, stout spines at the joints and on the ventral side, especially on the merus and carpus of each limb.




Figs. 124 to 126. *Niambia squamata* (Budde-Lund), 1885.
129. Male, × 12.
125. Pleopoda of male, × 12.
126. Pleopoda of female, × 14.

Abdomen with all six segments separate and exposed. The lateral parts of the first and second are covered by the thorax; the following three have the ends extended and tapering to a point, and bent almost directly backward. The terminal segment has the median part of its dorsal surface depressed or concave; the outline of the segment is triangular, with concave sides tapering behind to a rather sharp triangular point. The basal joints of the uropoda are slightly tapering; they do not reach as far as the tip of the last segment. The external branches are large, rather wide at the base, and tapering gradually to a point. The inner branches are elongate and tapering and lie along the ventral aspect of the last segment of the abdomen but do not quite reach its tip.

Three specimens(Cat. No. 3254) were obtained at Zambi, June 1915. The species has previously been recorded from the Portuguese Congo (Landana, Chinchoxo) and doubtfully (Dollfus, 1898) from Senegal.

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