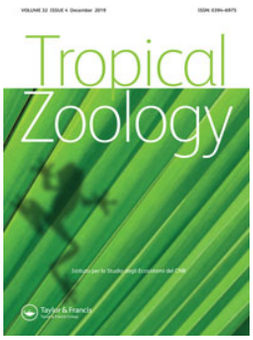

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TERRESTRIAL ISOPODS FROM WEST AFRICA

PART 2: FAMILIES TYLIDAE, LIGIIDAE, TRICHONISCIDAE, STYLONISCIDAE, RHYSCOTIDAE, HALOPHILOSCIIDAE, PHILOSCIIDAE, PLATYARTHRIDAE, TRACHELIPIDAE, PORCELLIONIDAE, ARMADILLIDIIDAE: PUBBLICAZIONI DEL CENTRO DI STUDIO PER LA FAUNISTICA ED ECOLOGIA TROPICALI DEL C.N.R.: CLIV

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(PUBBLICAZIONI DEL CENTRO DI STUDIO PER LA FAUNISTICA ED ECOLOGIA TROPICALI DEL C.N.R.: CLIV)

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I. INTRODUCTION

This part of our review of West African Oniscoidea (see map in FERRARA & SCHMALFUSS, 1976, p. 4) deals with the families Tylidae, Ligiidae, Trichoniscidae, Styloniscidae, Rhyscotidae, Halophilosciidae,

Platyarthridae, Trachelipidae, Porcellionidae, Armadillidiidae. We studied unpublished material from the British Museum (Natural History), the Museo Civico di Storia Naturale di Genova, the Naturhistoriska Riksmuseet of Stockholm, the Museo Zoologico dell'Università di Torino, the Musée Royal de l'Afrique Centrale in Tervuren and the Museo Zoologico dell'Università di Firenze (collected between 1970 and 1973 by E. Kohler and K. Pfau).

Though some of these specimens bear locality labels which are almost certainly wrong (*Schizidium* sp., *Leptotrichus atracheatus* n. sp.), they have nonetheless been included as listed by their respective Museums.

As emphasized in Part 1, our study is by no means complete. We are sure that many new species will be discovered in the future and that only further large-scale collecting will clarify the distribution and ecology of the known species. The systematics of such difficult families as Philosciidae will be clarified only after piecing together many elements.

Part 1 (FERRARA & SCHMALFUSS, 1976) of this review deals with Eubelidae, while Parts 3 and 4 (in preparation) are dedicated respectively to Armadillidae and to addenda and conclusions on the ecology and biogeography.

We are grateful to Dr E. KOHLER (Tübingen) and Dr K. PFAU (Saarbrücken) for their loan of new material from various parts of West Africa and Prof. P. L. G. BENOIT (Tervuren), Dr R. LINCOLN (London), Prof. E. TORTONESE (Genova) and Prof. U. PARENTI (Torino) for the loan of material collected many years ago. As well, we wish to thank Prof. O. KRAUS (Hamburg), for his advice on the nomenclature.

The abbreviations are as follows:

B.M. = British Museum (Natural History), London;
M.F. = Museo Zoologico « La Specola » dell'Università, Firenze;
M.G. = Museo Civico di Storia Naturale « Giacomo Doria », Genova;
M.R.A.C. = Musée Royal de l'Afrique Centrale, Tervuren;
M.S. = Naturhistoriska Riksmuseet, Stockholm;
M.T. = Museo Zoologico dell'Università, Torino.

II. FAMILY TYLIDAE Milne-Edwards, 1840

Important taxonomic characters in defining this family are: uropods in a completely ventral position (not visible in dorsal view); uropod exopodite obsolete; pleopod exopods with tracheal system; antennula

reduced to 1 joint; only pleopod 2 endopodite used as copulatory organ; ability to conglobate.

After studying the anatomy of this family, SCHMALFUSS (1974) definitely placed it in the suborder Oniscoidea, thus resolving its long-debated systematic position. It consists of the genera *Tylos*, distributed throughout the world, and *Helleria* Ebner, 1868 (= *Syspastus* Budde-Lund, 1885), contaninig only the species *Helleria brevicornis* Ebner, 1868 which is restricted to a part of the western Mediterranean. The splitting into two subfamilies (or even two families!), each consisting of a monotypic genus, is an unnecessary systematic complication since both genera undoubtedly belong to a monophyletic unity sharing many synapomorph characters.

A. Genus TYLOS Audouin, 1826

Type-species: *Tylos Latreillei* Audouin, 1826.

Diagnosis. - Able to roll up into a perfect ball; head with a triangular protrusion between the antennae and lateral quadrangular grooves into which the antennae fit when the animal is rolled up; antenna with a 4-jointed flagellum; antennula reduced to 1 joint; peraeon segment 1 with ventral grooves in the epimera (locking mechanism when conglobating); pleon tergites not fused (contrary to *Helleria*); pleon epimera forming ventral « phylacomeres » covering part of the ventral surface of the pleon; pleopod exopods with a tracheal system; only pleopod 2 endopodite modified as male copulatory organ; uropods in a completely ventral position, with terminal endopodite, exopodite obsolete.

This well-defined genus contains about a dozen species distributed throughout the world. While most of these live on sandy sea-shores were they feed on wrack, *T. africanus* Ferrara, 1974 and few others are known to inhabit rocky crevices exposed to tidal spray.

1. *Tylos latreillei* Audouin, 1826.

Tylos Armadillo DOLLFUS, 1896, p. 550; DOLLFUS, 1898, p. 126.
Tylos armadillo DOLLFUS, 1899, p. 256.
Tylos Latreillei PAULIAN DE FÉLICE, 1940b, p. 144.
Tylos sardous GIORDANI-SOIKA, 1954, p. 73.

Records from West Africa. - Senegal: Dakar (DOLLFUS, 1898; PAULIAN DE FÉLICE, 1940b); Rufisque (DOLLFUS, 1898).

Distribution. - Coasts of the Mediterranean, Black Sea and Red Sea, Atlantic coast from France to Senegal, Atlantic islands, Atlantic and Pacific coasts of North America.

III. Family LIGIIDAE Brandt, 1833

This family is characterized by large eyes with more than 50 ommatides (only a few troglobionts have secondarily reduced eyes); antennal flagellum with at least 9 joints; pleopod exopodites with no respiratory system, a paired penis, and only pleopod 2 specialized as a male copulatory organ. The Ligiidae are split ecologically between a group inhabiting rocky seashores (all but a few species of the genus *Ligia*) and one inhabiting wet terrain (remaining species of *Ligia* and rest of this family).

The genus *Ligia* occurs throughout the world, *Ligioides* in Australia and the *Ligidium*-group (*Ligidium* and related genera) in the holarctic region.

A. Genus Ligia Fabricius, 1798

Type-species: *Oniscus oceanicus* Linnaeus, 1767.

Diagnosis. - Body oval-shaped; pleon with pronounced epimera; body-outline uninterrupted between peraeon and pleon; chromatophores separate from each other enabling the animal to change colour according to external stimuli; eyes large with more than 200 hexagonal ommatids arranged in regular rows; antenna always surpassing third peraeon tergite; flagellum with more than 9 joints; antennula with very small button-like third (distal) joint; peraeopod dactylus with two claws; telson with lateral pointed « epimera »; uropod protopodites caudally truncate, exo- and endopodite inserted at the same level, side by side and equally long. This latter character clearly separates *Ligia* from the other genera of the family.

The genus consists of about 20 species (cf. Gruner, 1966, p. 162) with a world-wide distribution. Most species live in the sprayzone of rocky seashores, scavenging on wrack and feeding on algae. Some species have become truely terrestrial [e.g. *L. simoni* (Dollfus, 1893)], living above 1000 m in the mist forests of northern South America.

The institution of various sub-genera is debatable and needs further investigation. West Africa has thus far yielded the species *L. gracilipes* and *L. exotica* (the record of *L. olfersi* Brandt, 1833 refers to *L. exotica*, see page 24), easily distinguished by the telson tip which is rounded in *Ligia gracilipes* Budde Lund, 1885 and acutely pointed in *Ligia exotica* Roux, 1828. A third species, *Ligia curvata* from Lobito in Angola (Vandel, 1948b), occurs outside the area under consideration. This species differs from *L. gracilipes* only in the shape of the second male pleopod endopodite which is distally straight in *L. gracilipes* and angled sharply outward in *L. curvata*.

1. *Ligia exotica* Roux, 1828.

Ligia exotica DOLLFUS, 1893, p. 24; DOLLFUS, 1897, p. 212; DOLLFUS, 1898, p. 126; DOLLFUS, 1899, p. 256; JACKSON, 1922, p. 694, figs; PAULIAN DE FÉLICE, 1940b, p. 144; BRIAN & DARTEVELLE, 1949, p. 95, figs; ARCANGELI, 1950a, p. 75.
Ligyda exotica VAN NAME, 1920, p. 72, figs.
Ligyda olfersii VAN NAME, 1920, p. 77, figs.
Megaligia exotica VERHOEFF, 1928, p. 118.
Ligia olfersi VANDEL, 1946, p. 231; BRIAN & DARTEVELLE, 1949, p. 98, figs.
Ligia sp. (? *exotica* Roux, 1828) MONOD, 1931, p. 17.

Records from West Africa. - Senegal: Dakar; Saint-Louis (DOLLFUS, 1897, 1898).

Guinea Bissau: Bissau (JACKSON, 1922).

Guinea: Isle of Kassa (PAULIAN DE FÉLICE, 1940b).

Liberia: without locality (VERHOEFF, 1928).

? Cameroon: without locality (MONOD, 1931).

Cabinda: Malembe (BRIAN & DARTEVELLE, 1949).

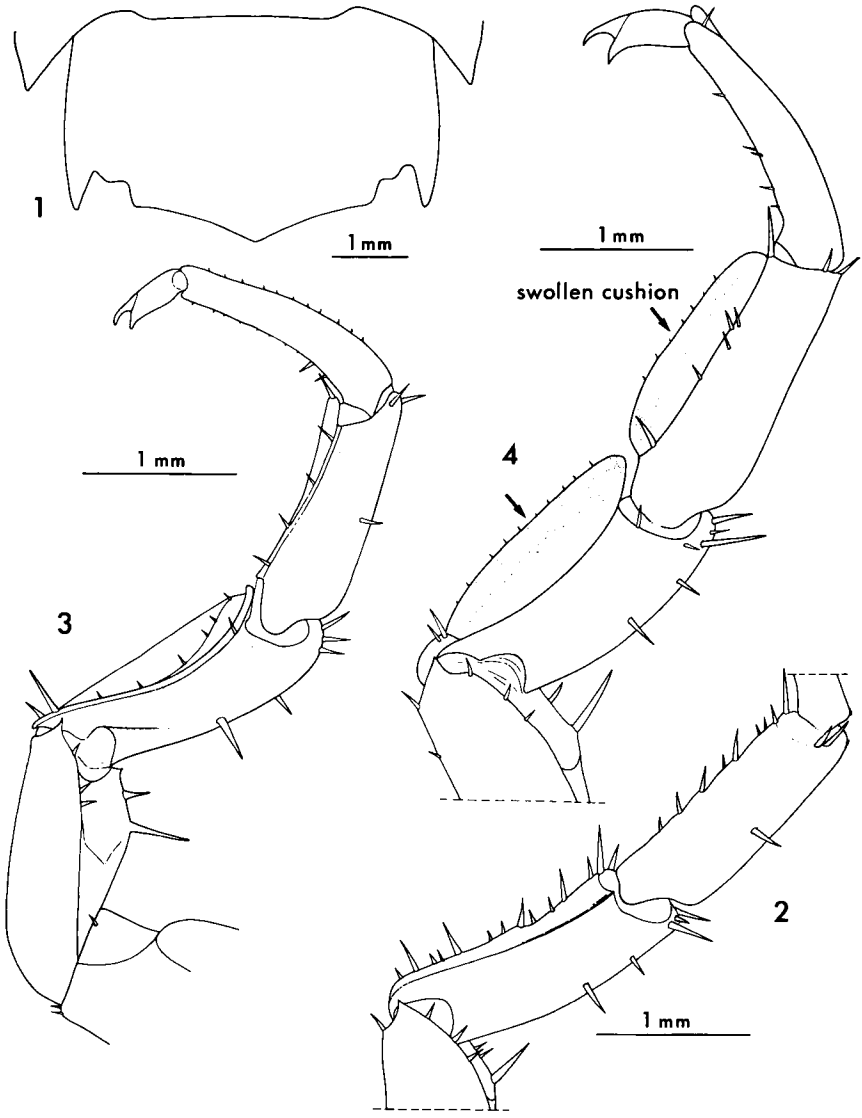
Zaire: Banana (VAN NAME, 1920; BRIAN & DARTEVELLE, 1949; ARCANGELI, 1950a); Moanda, Vista (BRIAN & DARTEVELLE, 1949).

Distribution. - Tropical shores all over the world.

Specimens examined. - Guinea Bissau: Bolama, 9 ♂♂, 18-26 mm long, 5 ♀♀, 18-21 mm long, (M.G.), leg. L. Fea, VI-XII.1899.

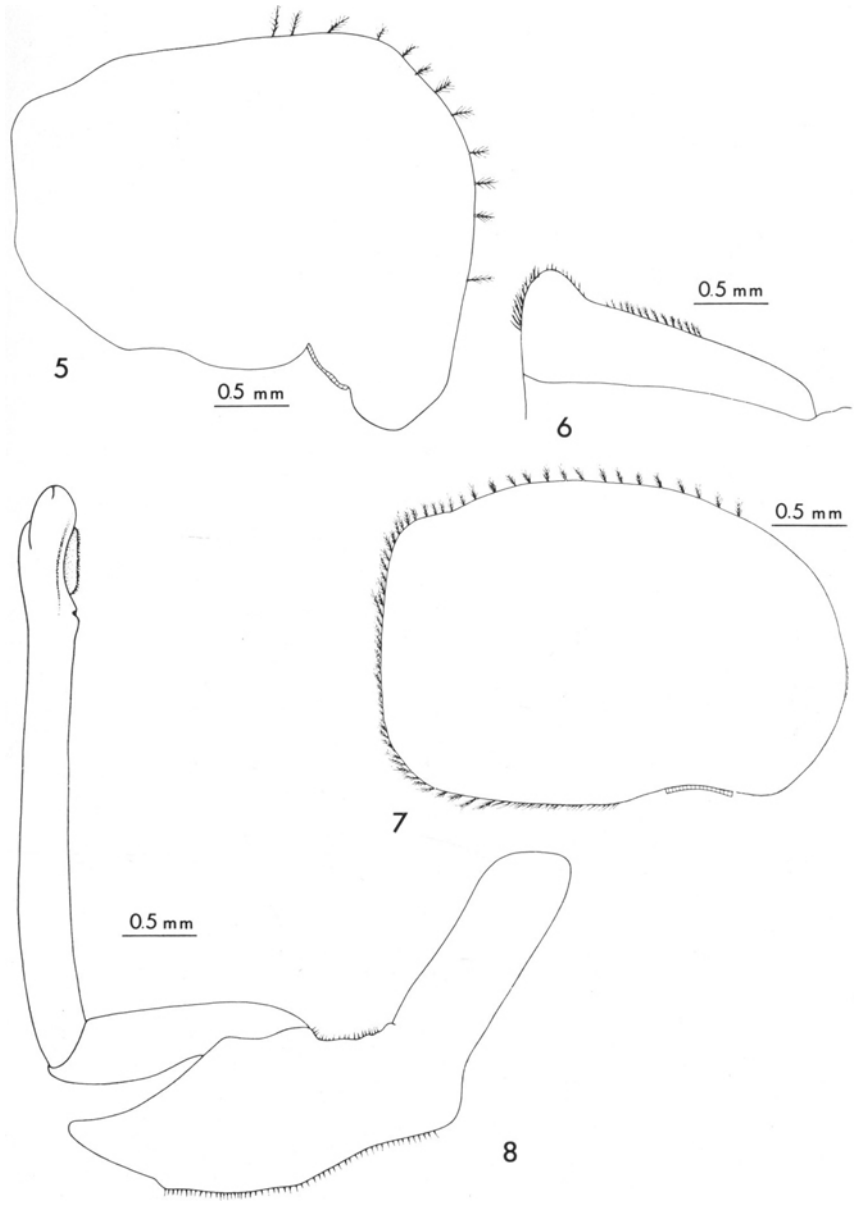
Description. - Back olive-brown; telson (Fig. 1) with a long acute lateral process on each side, apex pointed at an angle of about 60°, two short blunt processes between apex and lateral process. Also figured by CHILTON (1916), JACKSON (1922) and BRIAN & DARTEVELLE (1949). Angles of the processes varying, even among specimens from the same locality; antenna surpassing end of peraeon but not reaching end of abdomen in adult and subadult specimens; flagellum with 30 joints in a male 22 mm long, and with 22 joints in a female 21 mm long. Figured by CHILTON (1916), VAN NAME (1920), BRIAN & DARTEVELLE (1949). Mouth parts figured by CHILTON (1916).

Peraeopods 1, ♂ (Figs 3, 4) with merus and carpus ventrally equipped with a soft cushion-like expansion which swells in the presence of preserving fluid and which can be either shrunken or swollen according to the physiological condition of the animal at capture. These cushions, which have a striated surface somewhat resembling human fingerprints, undoubtedly provide a safe hold during copulation. The same cushions are present on peraeopods 2-3; peraeopod 1 ♂ with a slightly to strongly developed frontal process on the distal end of the propodus. Propodus process and cushions missing in the female (Fig. 2). Pleopod exopodites not differing in male and female; exopodite 1 (Fig. 5) greatly enlarged frontally, caudal margin with small plumose setae; exopodites 2-5 large, margins equipped with plumose setae (exopodite 2 see Fig. 7). The enlarged



Figs 1-4. — *Ligia exotica* Roux; ♂: telson (Fig. 1), left peraeopod 1 (Figs 3, 4); ♀: left peraeopod 1 (Fig. 2).

exopodites and plumose setae may serve to retain a thin water-layer over a large surface for respiration. Endopodite 1 ♂ (Fig. 6) not specialized; endopodite 2, ♂ (Fig. 8), with 2 mobile joints distal end bulbous with a lateral cushion bearing tiny setae; protopodite with a large lateral



Figs 5-8. — *Ligia exotica* Roux ♂: pleopod 1 exopodite (Fig. 5), pleopod 1 endopodite (Fig. 6), pleopod 2 exopodite (Fig. 7), pleopod 2 endopodite (Fig. 8).

process. Uropods, see CHILTON (1916), VAN NAME (1920); protopodite 6 mm long, endopodite 7 mm and exopodite 9 mm in a ♂ 21 mm long; peraeopods 1-3 and pleopod endopodite 2 in the ♂♂ sexually specialized.

Remarks. - Some males from Bolama (Guinea Bissau) have peraeopod 1 with a very pronounced process at the distal end of the propodus while others have a very slight process, not visible caudally. These ♂♂ all have identical pleopod 2 endopodites. The same situation occurs in specimens from Mexico and Florida which leads us to conclude that *Ligia olfersi* is a synonym of *Ligia exotica*. The two « species » have always been found in the same samples, in itself a very unlikely ecological condition.

Two of the five ♀♀ (19 and 21 mm long) from Bolama have a marsupium.

The commensal sessile protozoan *Pyxicola ligiae* Cuenot (Peritricha, Ciliata) (or some closely related species) is regularly found on the more sheltered parts of the pleopods (det. H. Netzel, Tübingen).

2. *Ligia gracilipes* Budde-Lund, 1885.

Ligia gracilipes BUDDE-LUND, 1885, p. 270; DOLLFUS, 1893, p. 25; DOLLFUS, 1898, p. 126; DOLLFUS, 1899, p. 256; COLLINGE, 1920, p. 473; JACKSON, 1922, p. 695, figs; PANNING, 1924, p. 196; BARNARD, 1932, pp. 180-187; VANDEL, 1945, p. 231; VANDEL, 1948a, p. 1, figs; BRIAN & DARTEVELLE, 1949, p. 99 + addendum, figs; BRIAN, 1953, p. 5.
Ligia italica PAULIAN DE FÉLICE, 1940b, p. 144.

Records from West Africa. - Senegal: Dakar (DOLLFUS, 1898; PAULIAN DE FÉLICE, 1940b; VANDEL, 1948a).

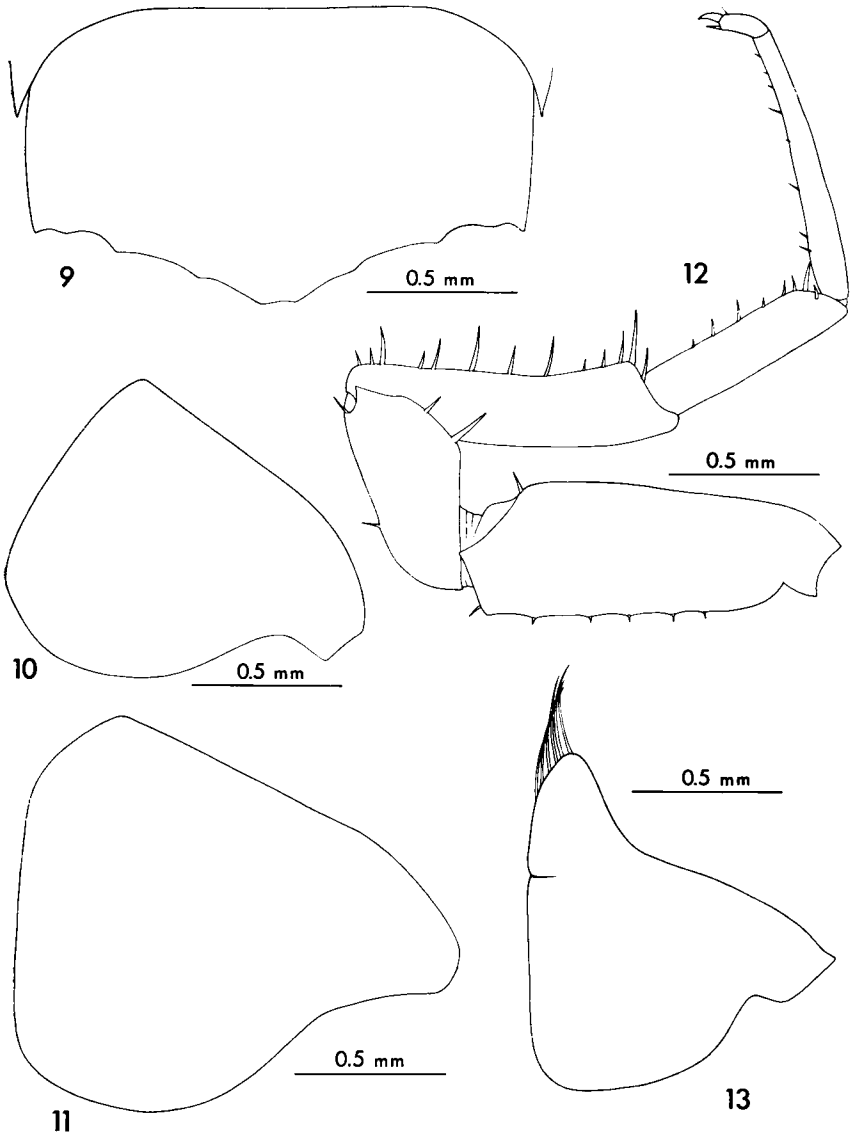
Cameroon: Kribi (VANDEL, 1948a).

Cabinda: Landana, now called Guilherme Capela (BUDDE-LUND, 1885, who presumably misread the label Landana as Laudana; BRIAN & DARTEVELLE, 1949; BRIAN, 1953).

« South Africa » (BUDDE-LUND, 1885; JACKSON, 1922; PANNING, 1924) is obviously cited erroneously as BARNARD (1932, p. 180) points out: « By ' South Africa ' BUDDE-LUND (1885) evidently understood Africa south of the equator. The mistake has been followed by JACKSON (1922) and PANNING (1924) ». The station « Angola, Lobito » quoted by VANDEL (1948a) must be cancelled for *L. gracilipes*, as he later proved that the Angolan specimens belonged to a separate species, *L. curvata* (VANDEL, 1948a, postscript, and 1948b).

Distribution. - Apparently West African coast from Dakar (Senegal) to Cabinda (ex-Portuguese Congo).

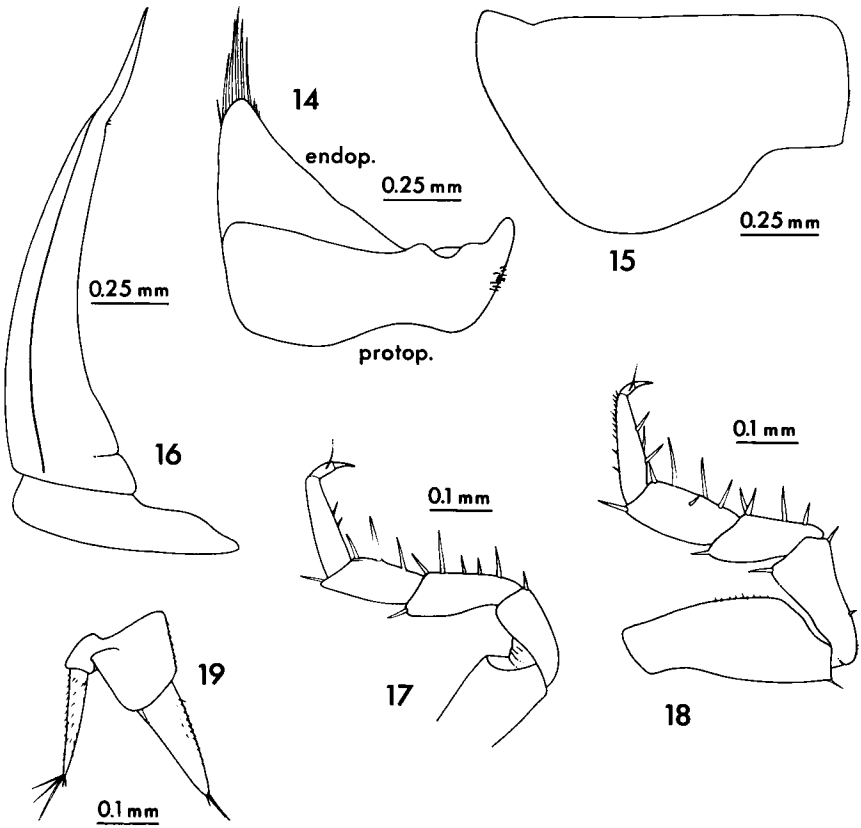
Specimens examined. - Cameroon: Victoria, 3 ♂♂, 6.5-8 mm long, 16 ♀♀, 6-10 mm long, (M.S. No. 5539), collector ?, date ?; 20 km W Victoria, rocky beach, 1 ♀, 10 mm long, (coll. H. Schmalfuss), leg. E. Kohler, 10.III.1973.



Figs 9-13. — *Ligia gracilipes* Budde-Lund; ♀: telson (Fig. 9), pleopod 1 exopodite (Fig. 10); ♂: right peraeopod 1 (Fig. 12), pleopod 1 exopodite (Fig. 13). *Ligia italica* Fabricius (from Rhodos) ♀: pleopod 1 exopodite (Fig. 11).

Description. - Back olive green, as is common in other species of *Ligia*; telson (Fig. 9) rectangular, with a ragged posterior margin and blunt, slightly bifurcated tip. All the examined specimens and fig. 33 in

BRIAN & DARTEVELLE (1949) show this shape so fig. 15 in JACKSON (1922) showing a straight and rounded posterior margin is probably incorrect. Antenna extremely long and slender, surpassing the telson by about 1/4 of their length in adult and subadult specimens. See JACKSON



Figs 14-19. — *Ligia gracilipes* Budde-Lund ♂: protopodite and endopodite of the pleopod 1 (Fig. 14), pleopod 2 exopodite (Fig. 15), pleopod 2 endopodite (Fig. 16). « *Trichoniscus* » sp. ♀: peraeopod 1 (Fig. 17), peraeopod 7 (Fig. 18), left uropod (Fig. 19).

(1922) and BRIAN & DARTEVELLE (1949) for figures; flagellum with 31 joints in a ♀, 10 mm long and with 30 joints in a ♀, 9 mm long. Mouthparts figured in BRIAN & DARTEVELLE (1949). Peraeopod 1, ♂, (Fig. 12 and BRIAN & DARTEVELLE, 1949) has no hooks, brushes or cushions that could be interpreted as accessory structures used in copulation,

and is identical to that of the female. Pleopod exopodite 1, ♂ (Fig. 13), with a row of stout long setae on median lobe, ♀ without median lobe and setae (Fig. 10); endopodite 1, ♂, triangular with a row of setae as in exopodite (Fig. 14); exopodite 2, ♂, without setae (Fig. 15); endopodite 2 (Fig. 16) slightly curved outwards with a somewhat twisted slightly sickle-shaped distal part; pleopods also figured by VANDEL (1948a) and BRIAN & DARTEVELLE (1949). Uropods (figured by JACKSON, 1922 and BRIAN & DARTEVELLE, 1949) extremely long; protopodite about as long as abdomen, exopodite and endopodite about four times as long as protopodite.

Only pleopods 1-2, ♂ ♀, differ in shape.

Remarks. - Obviously inhabitants of rocky sea-shores as are most other species of *Ligia*; VANDEL (1948a) states the differences between the ♂♂ of *Ligia gracilipes* and its probably closest relative, *Ligia italica* Fabricius, 1798. As shown in Figs 10, 11, the ♀ ♀ of these two species can be easily distinguished. The smallest ♀ with marsupium is 8 mm long.

IV. FAMILY TRICHONISCIDAE Sars, 1899

Unable to conglobate; eyes with 1-3 ommatides, often completely reduced; antenna with 2 to 12-jointed flagellum; pleopods without tracheal system; pleopod 1, ♂, protopodite not enlarged, about same size as exopodite; genital papilla not enlarged distally.

This family contains about 50 genera distributed throughout the northern hemisphere.

A. Genus TRICHONISCUS Brandt, 1833

Type-species: *Trichoniscus pusillus* Brandt, 1833.

Diagnosis. - Eyes with 3 ommatides (sometime reduced); peraeon tergites without longitudinal ridges; antenna with 3 to 4-jointed flagellum; peraeopod 7, ♂, without hook-shaped process; pleopod 1 exopodite, ♂, without spiny or brushy appendices; endopodite functioning as gonopod, with 2 joints of about equal length.

Numerous species of *Trichoniscus* occur throughout western Asia and northern Africa (*T. pusillus* has been introduced to North America). The generic position of species recorded outside this range has still to be settled.

1. « *Trichoniscus* » (*Fakoniscus*) *pterydicola* Paulian de Félice, 1940.

Trichoniscus (*Fakoniscus*) *pterydicola* PAULIAN DE FÉLICE, 1940a, p. 99, figs.

Records from West Africa. - Cameroon: Mount Cameroon.

Distribution. - Known only from the type locality.

Remark. - This species probably belongs to a genus of the family Styloniscidae rather than to the genus *Trichoniscus*. However, the scanty description and lack of males makes any conclusion impossible.

2. « *Trichoniscus* » sp.

Specimens examined. - Cameroon: 20 km W Victoria, 2 ♀♀, without marsupium, 1.8 and 2.4 mm long, (n. 155 M.F.), leg. E. Kohler, 10.III.1973.

Description. - Back reddish brown with short upright dorsal spines situated on small tubercles; eyes with 3 ommatides; telson trapezoidal as in other species of Trichoniscidae; peraeopods 1 and 7 as in Figs 17, 18; uropods (Fig. 19) with endopodite and exopodite of about equal length.

Remarks. - The specimens do not belong to « *T.* » *pterydicola* if the drawings of the peraeopods by PAULIAN DE FÉLICE (1940a, p. 99) are correct. In the absence of any ♂♂, its attribution to the genus *Trichoniscus* (and consequently to the family Trichoniscidae) is questionable.

V. FAMILY STYLONISCIDAE Vandel, 1952

Unable to conglobate; frontal line absent; eyes with 3 ommatides (sometides reduced); antenna with 3 to 14-jointed flagellum; pleopod-exopodites without tracheal system; pleopod protopodite 1, ♂, very enlarged; genital papilla distally enlarged.

This family occurs throughout the southern hemisphere, in central America and in the western Mediterranean.

A. Genus CLAVIGERONISCUS Arcangeli, 1930

Type-species: *Clavigeroniscus riquieri* Arcangeli, 1930.

Diagnosis. - Eyes with 3 ommatides; antennula with third joint lengthened; mandibles with 1 penicil on the right, 3 penicils on the left; maxillulae with 3 penicils on inner branch, innermost penicil the longest; genital papilla ending in a long thin tube; pleopod 1, ♂, Styloniscid like;

endopodite shaped distally like a stiff stick; pleopod 2, ♂, with small exopodite, endopodite 2-jointed, distal joint with an enlarged lobed tip.

Three species of this genus are known: *C. riquieri* Arcangeli from central and South America, *C. sassandrai* (Paulian de Félice, 1940) from western Africa and *C. mussaui* Vandel, 1973 from Melanesia.

1. *Clavigeroniscus sassandrai* (Paulian de Félice, 1940).

Trichoniscus (*Afroniscus*) *Sassandrai* PAULIAN DE FÉLICE, 1940a, p. 101, figs.
Afroniscus sassandrei VANDEL 1945, p. 236.
Trichoniscus sp. PAULIAN DE FÉLICE, 1940a, p. 102.
Clavigeroniscus riquieri VANDEL, 1952a, p. 70, figs; VANDEL, 1952b, p. 85.
Clavigeroniscus sassandrei VANDEL, 1973b, p. 19.

Records from West Africa. — Ivory Coast: Sassandra, Port Bouet (PAULIAN DE FÉLICE, 1940a); Mt Nimba, Mt Tonkoui (VANDEL, 1952a, 1952b).

Distribution. - Known only from the above localities.

VI. FAMILY RHYSCOTIDAE Arcangeli, 1950

Cephalon with a large bulbous anterior protuberance containing two robust muscolar bunches inserted in the clypeus; protuberance limited dorsally by the supra-antennal line; antenna with 2-jointed flagellum; maxillae almost semicircular; maxillipeds with very short palpus and endite; pleopod exopodites without pseudotracheae; protandrous hermaphrodites.

The family includes the genera *Rhyscotus* Budde-Lund, 1885 and *Rhyscotoides* Arcangeli, 1950, each including some ten species distributed mostly in tropical America and Africa.

A. Genus RHYSCOTUS Budde-Lund, 1885

Type-species: *Porcellio* (*Rhyscotus*) *turgifrons* Budde-Lund, 1885.

Diagnosis. - All the family characters; vesicles lacking between the claws of the dactylopodites of peraeopods; cephalic protuberance less than half the length of the vertex in dorsal view.

1. *Rhyscotus globiceps* Budde-Lund, 1908.

Rhyscotus globiceps BUDDE-LUND, 1908, p. 301, figs; ARCANGELI, 1930, p. 32; ARCANGELI, 1950a, p. 54, figs; ARCANGELI, 1950b, p. 20.

Records from West Africa. - Some of the localities from Zaire may be situated in the area under consideration.

Distribution. - Western and central Zaire (Loango, Thysville, Luluabourg, Kisantu). Angola.

Specimens examined. - ? Sao Thome: Zampalma, 1 « ♂ » 7 mm long, (B.M. No. 136), collector ?, date? (the tube also contains a label « Luanda, Angola, Aug. 1949, L.F. Galbraith »).

Remarks. - The species is well-illustrated by ARCANGELI (1950a). The known range of the species would seem to indicate that the second label (« Luanda, Angola... ») is the correct one.

2. *Rhyscotus rotundatus* n. sp.

Specimens examined. - ? Sao Thome: Zampalma, 9 « ♂♂ » 3-4 mm long, (B.M. No. 136), collector ?, date?

Description. - Holotype « ♂ » 4 mm long.

Back yellowish-white with dark blotches on head, peraeon epimera and pleon; dorsal surfaces densely covered with short upright setae; head (Figs 20, 21) cube-like, very steep frontally above the profrontal tuberosity; tuberosity very small and short compared to other species of *Rhyscotus* and *Rhyscotoides*; eyes with 10 ommatides; peraeon cylindrical forming a semicircle in cross-section, epimera vertical; antenna (Fig. 21) very short, not surpassing peraeon tergite 2; peduncle with thickset points, flagellum with proximal joint shorter than the distal one; peraeopod 1 (Fig. 24) not specialized and apparently lacking the antennal cleaning-brush; peraeopod 7 (Fig. 25) not specialized, ischiopodite ventrally concave; claw vesicles, as found in the genus *Rhyscotoides*, are missing; telson (Fig. 22) very short with an acutely pointed apex, sides concave; pleopods with exopodite 1 very small and rounded (Fig. 26); endopodite 1 slightly and evenly bent outwards, apex pointed and not specialized (Fig. 27); exopodite 2 large with a slight medial lobe and the channels found in all species of Rhyscotidae (Fig. 28); uropod (Fig. 23) exopodite and endopodite very short, exopodite less than twice as long as protopodite.

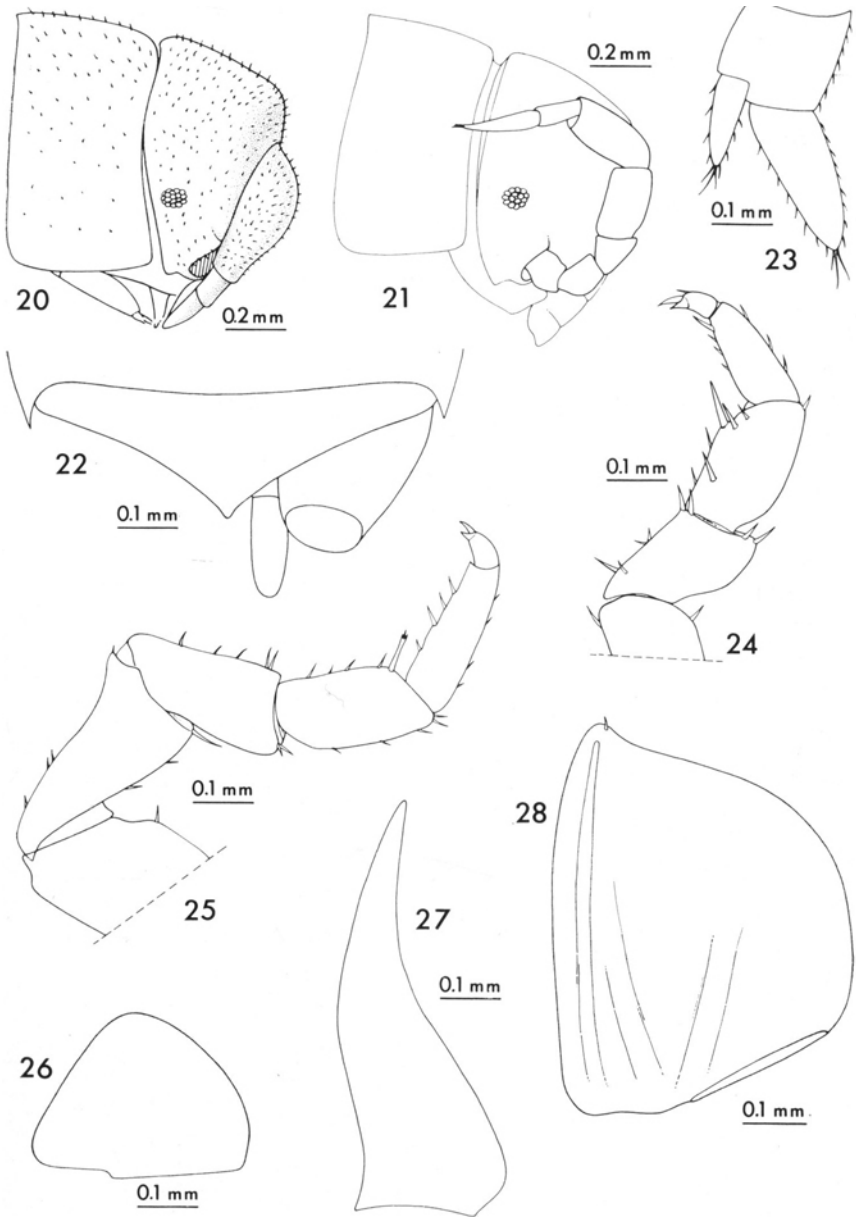
Paratypes: Eight specimens, 3-4 mm long, all in the male phase.

Remarks. - As the locality label has a question-mark, the specimens may well have been collected elsewhere.

B. Genus RHYSCOTOIDES Arcangeli, 1950

Type-species: *Rhyscotus parallelus* Budde-Lund, 1893.

Diagnosis. - All the family characters; vesicle present between the claws of the dactylopodites; cephalic protuberance more than the half the length of the vertex in dorsal view.



Figs 20-28. — *Rhyscotus rotundatus* n. sp.: cephalon (Fig. 20), cephalon and antenna (Fig. 21), telson (Fig. 22), right uropod (Fig. 23), peraeopod 1 (Fig. 24), peraeopod 7 (Fig. 25), pleopod 1 exopodite (Fig. 26), pleopod 1 endopodite (Fig. 27), pleopod 2 exopodite (Fig. 28).

1. *Rhyscotoides legrandi* Johnson, 1956.

Rhyscotoides Legrandi JOHNSON, 1956, p. 106, figs.

Records from West Africa. - Togo: Lomé, Gbodjomé.

Distribution. - Known only from the above localities.

2. *Rhyscotoides moandae* Arcangeli, 1950.

Rhyscotoides Moandae ARCANGELI, 1950a, p. 55, figs; ARCANGELI, 1950b, p. 34.

Records from West Africa. - Nigeria: Olokemeji (ARCANGELI, 1950a). Zaire: Moanda (ARCANGELI, 1950b).

Distribution. - The only record outside the region under consideration is Albertville (now called Kalemie) in Zaire.

Specimens examined. - ? Sao Thome: Zampalma, 8 « ♂♂ », (B.M. No. 136), collector ?, date ?.

Remarks. - ARCANGELI (1950a) gives a detailed description of this species. As the locality label has a question-mark, the specimens may not be from Sao Thome.

3. *Rhyscotoides silvestrii* Arcangeli, 1950.

? *Rhyscotus turgifrons* DOLLFUS, 1898 (nec Budde-Lund), p. 125; DOLLFUS, 1899, p. 256; PAULIAN DE FÉLICE, 1940a, p. 110.
Rhyscotoides Silvestrii ARCANGELI, 1950a, p. 55, figs; ARCANGELI, 1950b, p. 6 and p. 34.
Rhyscotoides Sylvestrii JOHNSON, 1956, p. 113.

Records from West Africa. - Senegal: ? Rufisque (DOLLFUS, 1898); Dakar, Thiès (ARCANGELI, 1950a).
Zaire: without locality (ARCANGELI, 1950a); Boma (ARCANGELI, 1950b).

Distribution. - Senegal, Zaire and Angola.

VII. FAMILY HALOPHILOSCIIDAE Verhoeff, 1908

Without a complete frontal line and with a supra-antennal line; antenna with a 3-jointed flagellum; maxilliped bearing a penicil; peraeopods with a dactylar seta; genital papilla bifurcated, spermal ducts separate; pleopod exopodites without tracheal systems. The family contains only the genus *Halophiloscia.*

A. Genus HALOPHILOSCIA Verhoeff, 1908

Type-species: *Philoscia Couchii* Kinahan, 1858.

Diagnosis. - All the family characters.

Remarks. - The genus consists of the subgenera *Halophiloscia* s.s. and *Stenophiloscia* Verhoeff, 1908 which, together, contain about 20 species (mostly halophilous). These range from the Red Sea and eastern Mediterranean to the Pacific coast of the United States.

1. *Halophiloscia couchi* (Kinahan, 1858).

Philoscia Couchi DOLLFUS, 1898, p. 125; DOLLFUS, 1899, p. 256.
Philoscia Couchii PAULIAN DE FÉLICE, 1940a, p. 109.

Records from West Africa. - Senegal; Dakar (DOLLFUS, 1898).

Distribution. - Atlantic coast of Europe and northern Africa from Great Britain to Senegal; Atlantic islands (Cape Verde islands, Canary islands, Azores, Madeira); coasts of Mediterranean and Black Sea.

VIII. FAMILY PHILOSCIIDAE Vandel, 1952

Cephalon with supra-antennal line normally present (not visible in most of the species described here); frontal line often missing; pleon more or less sharply separated from peraeon; epimera occasionally well developed but usually close to pleonites, slightly or not at all visible from above; antenna with 3-jointed flagellum; maxilliped with or without penicil on the endite; genital papilla simple; pleopod exopodites without pseudotracheae.

Remarks. - VANDEL (1973a, p. 44) recently instituted this family, including it in the Oniscomorpha-group, together with the families Scyphacidae, Olibrinidae, Halophilosciidae, Oniscidae, Batytropidae and Beritoniscidae. Of these, the family Philosciidae contains the greatest number of forms. Almost all the families were previously considered as subfamilies of the family Oniscidae.

A good number of Philosciidae from West Africa belong, on the basis of the position of *noduli laterales*, to the *Chaetophiloscia* and *Rennelloscia* groups. They show nevertheless two peculiarities like the absence of a supra-antennal line and presence on the peraeon segment 7 of two *noduli* on each side. Several species have been described for West

Africa by earlier authors and it is quite possible that some of them correspond to species described in this paper. However, as the systematics of species and genera of this family is actually based on keys formerly not used, we thought it preferable to describe as new all those species which could not be surely identified, leaving the estabilishment of possible synonimies to a re-examination of types of the old species.

A. Genus ARCANGELOSCIA n. gen.

Diagnosis. - Gland pores normally present (not seen in *A. microphthalma* n.sp. probably because of the poor condition); peraeon 7 segment with two *noduli* on each side; d/c co-ordinates with a maximum on the fourth segment; frontal and supra-antennal lines absent; pleon epimera invisible from above; mandible with molar penicil dichotomized; maxillula with some cleft teeth on the outer branch; inner branch without posterior spine; maxilliped with spinose endite and penicil; uropod with insertion of endopodite proximal to that of exopodite.

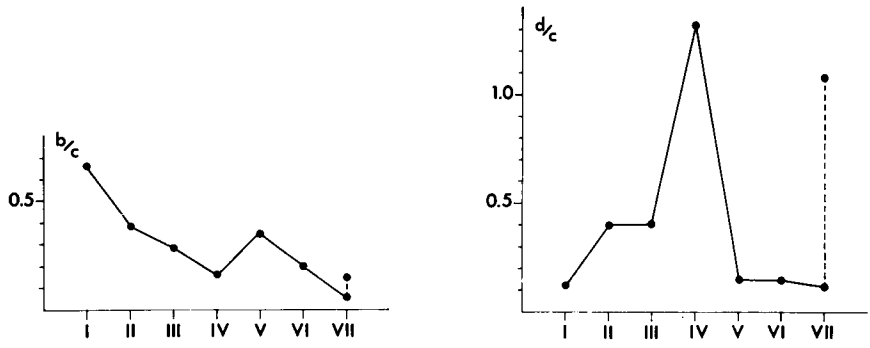


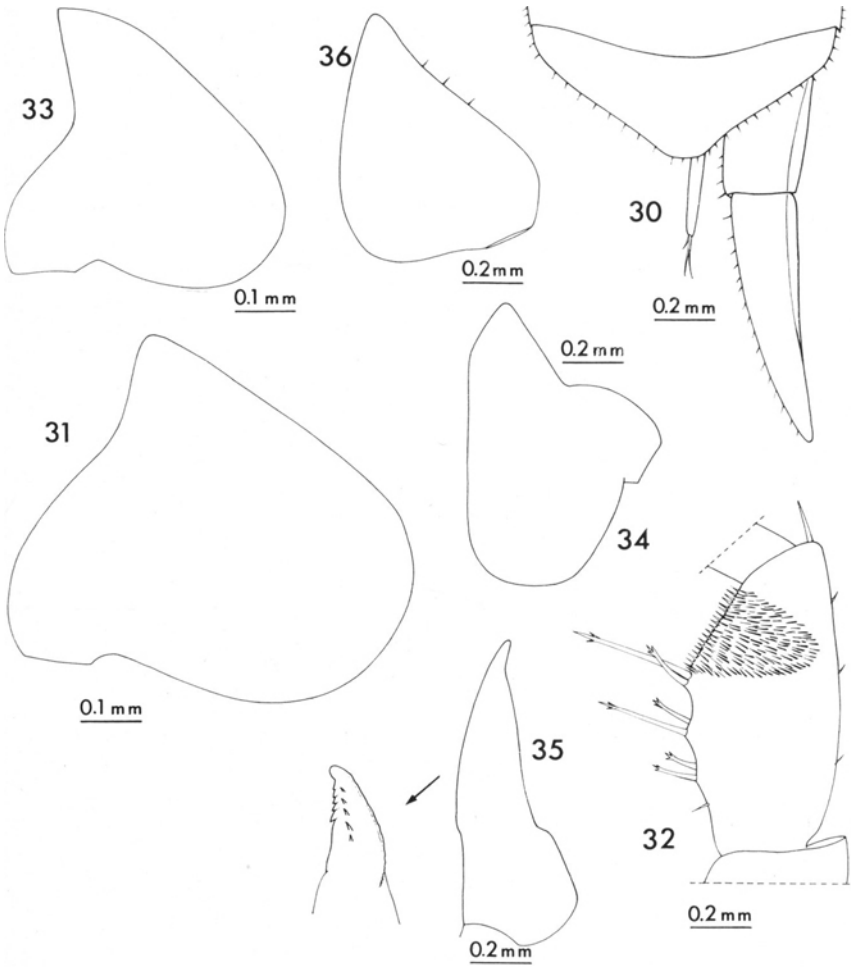
Fig. 29. — *Arcangeloscia buettneroides* n. sp.: b/c and c/d co-ordinates.

1. *Arcangeloscia buettneroides* n.sp.

Specimens examined. - Cameroon: Bile, 2 ♂♂, 4.5-7 mm long, 2 ♀♀, without marsupium, 6 mm long, (M.S. No. 5540), collector ?, VIII.1891; « Bileundi » (probably a reading mistake for Bibundi), 6 ♂♂, 3-7 mm long, 2 ♀♀ without marsupium, 6 mm long, 1 ♀ with marsupium 8.5 mm long, (M.S. No. 5696), collector ? (? Sjöstedt), VIII.1891.

Description. - Holotype ♂, 7 mm long, from Bile.

Back violet-brown with usual yellowish muscle spots; many short upright dorsal setae and occasional gland pores. For d/c, b/c co-ordinates see Fig. 29; frontal and supra-antennal lines absent; eyes with 24 ommatides; telson (Fig. 30) with slightly concave sides and truncated apex; antennae missing (see allotype); peraeopod 1 carpus (Fig. 32) with a few



Figs 30-36. — *Arcangeloscia buettneroides* n. sp.; ♀: pleopod 1 exopodite (Fig. 31); ♂: telson and right uropod (Fig. 30), peraeopod 1 carpus (Fig. 32), pleopod 1 exopodite 4 mm long (Fig. 33) and 7 mm long (Fig. 34), pleopod 1 endopodite (Fig. 35), pleopod 2 exopodite (Fig. 36)

long ventral cleft spines; peraeopod 7 not specialized; pleopods missing exopodites 1 (see paratypes); endopodite with narrowly rounded, slightly outwardly curved apex equipped with a row of tiny spines (Fig. 35); exopodite 2 see Fig. 36; uropods see Fig. 30.

Allotype: ♀, without marsupium, 6 mm long from Bile; identical to ♂ except for pleopods (see pleopod 1 exopodite, Fig. 31); antenna of medium length densely covered with upright setae, ratio of flagellum joints 16:10:12.

Paratypes: 1 ♂ juv., 4.5 mm long and 1 ♀ without marsupium 6 mm long from Bile. Pleopod 1 exopodite of juvenile ♂ shown in Fig. 33. Nine specimens from « Bileundi » (= Bibundi), containing a ♀ with marsupium 8.5 mm long. Pleopod 1 exopodite of an adult ♂, 7 mm long is shown in Fig. 34.

Remarks. - The series from Bile was labelled « *Philoscia buettneri* Hilgendorf ». However, the species is not recognizable from HILGENDORF's (1893a) original description, which could apply to nearly every West African Philosciidae. Moreover, the HILGENDORF specimens were collected in Togo.

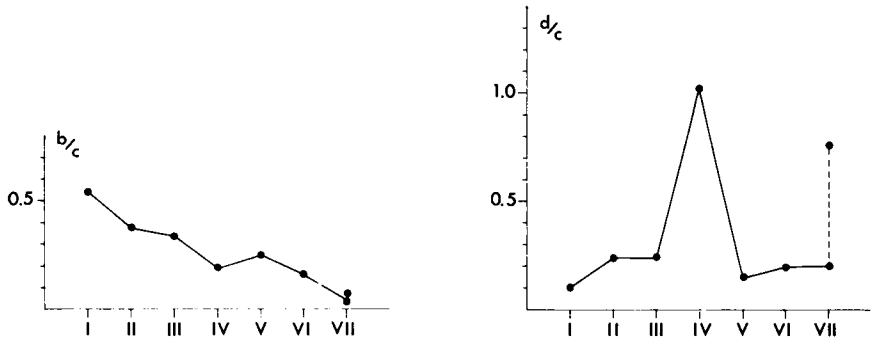


Fig. 37. — *Arcangeloscia microphthalma* n. sp.: b/c and d/c co-ordinates.

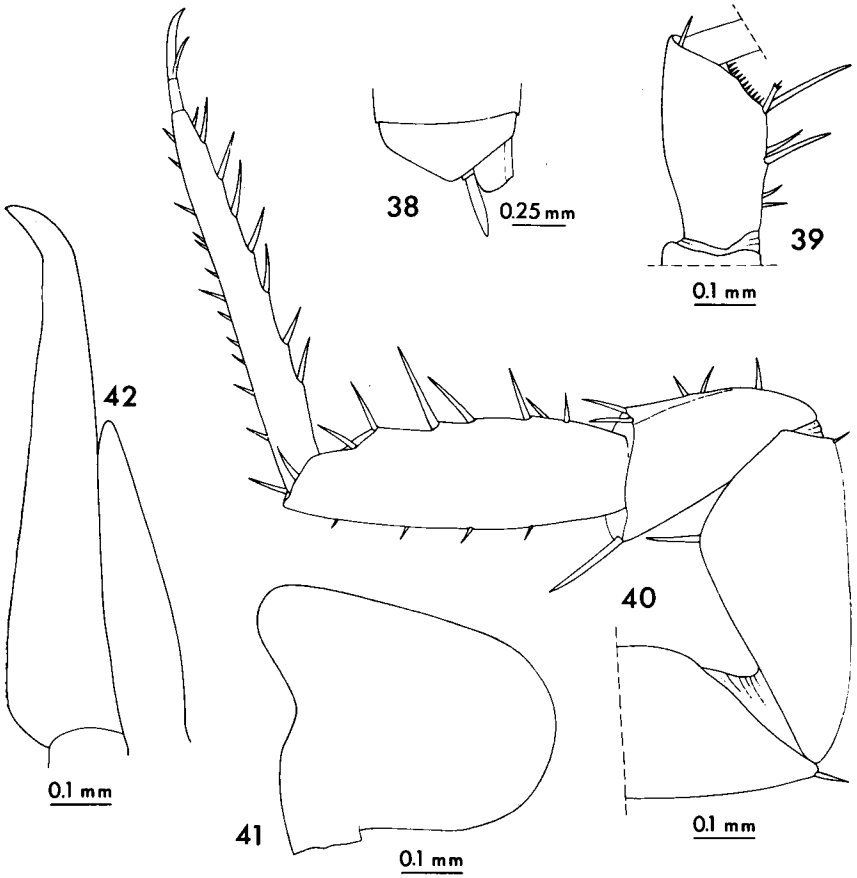
2. *Arcangeloscia microphthalma* n.sp.

Specimens examined. - Cameroon; Victoria, 2 ♂♂, 5 mm long, 3 ♀♀, 3-5.5 mm long, (M.T.) (all in rather poor condition), collector ?, date? (probably F. Silvestri during his voyage in 1912-1913).

Description. - Holotype ♂, 5 mm long.

Colourless (probably due to conservation). Back smooth without setae (perhaps lost in conservation); peraeon with shallow epimeral furrows,

no visible gland pores; for position of *noduli laterales* see Fig. 37; frontal and supra-antennal lines absent; eyes with 15 ommatides; telson (Fig. 38) with almost straight sides and rounded apex; antennae missing; in the paratype ♂ (same size) the antennae are medium-sized with the distal



Figs 38-42. — *Arcangeloscia microphthalma* n. sp. ♂: telson (Fig. 38), peraeopod 1 carpus (Fig. 39), peraeopod 7 (Fig. 40), pleopod 1 exopodite (Fig. 41), pleopod 1 endopodite (Fig. 42).

joint of the peduncle 0.9 mm long and flagellum 0.8 mm; ratio of flagellum joints (proximal to distal) is 13:8:9; peraeopod 1 with carpus (Fig. 39) very similar to that of *A. puylaerti* n.sp.; peraeopod 7 (Fig. 40) not specialized; pleopods with broadly rounded medial lobe on exopodite 1

(Fig. 41); endopodite 1 (Fig. 42) with sickle-shaped outwardly curved apex; endopodite 2 extremely long, surpassing apex of telson; uropod protopodites surpassing telson, exopodites missing (as in the paratype ♂); pleopods 1 and 2 of the male and female differ in shape.

Allotype ♀ with marsupium 5.5 mm long: peraeopod 1 identical to that of ♂; peraeopod 7 missing.

Paratypes: 1 ♂, 5 mm long, 2 ♀ ♀ juv. (without marsupium) 3 and 3.5 mm long.

Remarks. - This species, very similar to *A. puylaerti* n.sp., is readily distinguished by the smaller eyes, different male pleopod 1 exopodite and extremely long male pleopod 2 endopodite which surpasses the telson apex. The specimens, deposited in the Museum of Turin, are labelled « *Philoscia microphthalmus* Arc. ». Presumably these were named by ARCANGELI though he never published their description.

3. *Arcangeloscia puylaerti* n.sp.

Specimens examined. - Cameroon: Ngaoundere, 1 ♂, 5.5 mm long, 2 ♀ ♀, 5-7 mm long, (M.R.A.C.), leg. F. Puylaert, 12.VIII.1971; Victoria, 1 ♀, 6 mm long, (M.T.), collector ?, date ?

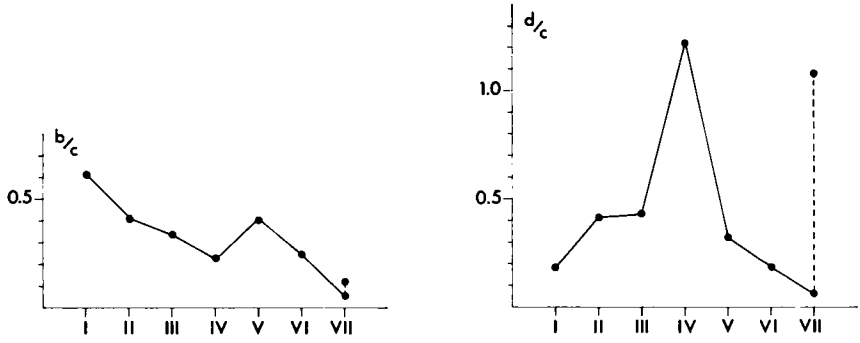
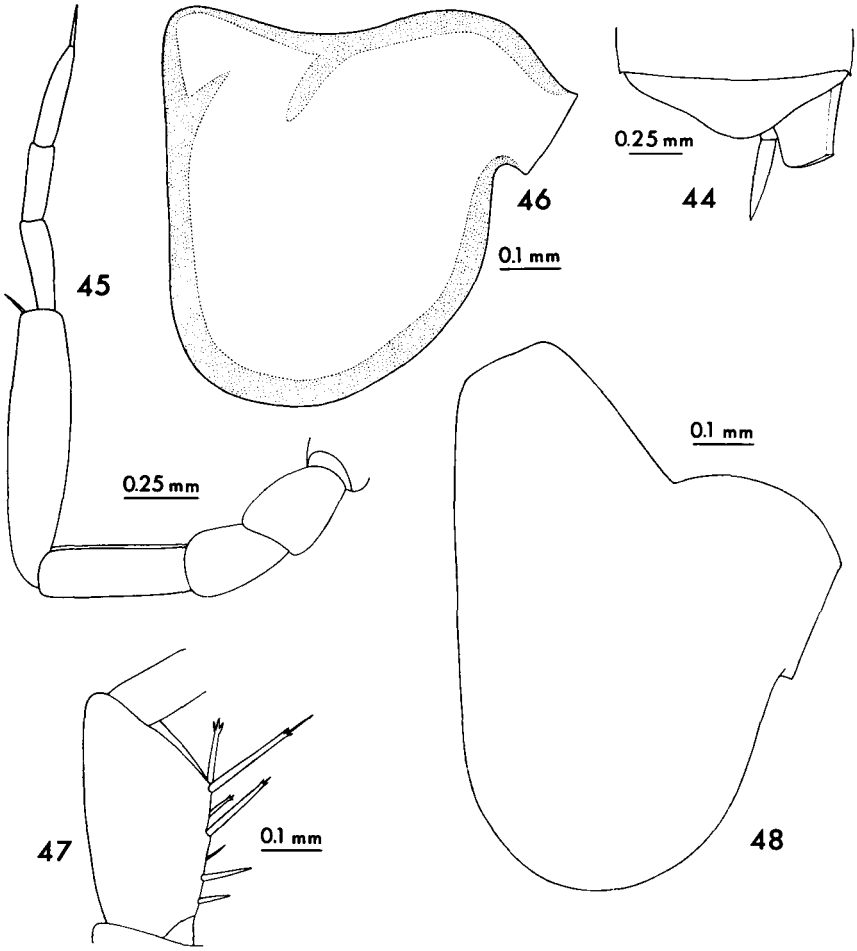


Fig. 43. — *Arcangeloscia puylaerti* n. sp.: b/c and d/c co-ordinates.

Description. - Holotype ♂, 5.5 mm long, Ngaoundere.

Violet-brown dorsally with the usual yellowish muscle spots; antenna with proximal joint, distal half of distal joint and flagellum whitish, hind-corners of peraeon epimera colourless; tergites smooth without setae; some gland pores present; d/c, b/c co-ordinates see Fig. 43; frontal and supra-antennal lines absent; eyes with about 25 ommatides arranged in

four longitudinal rows; pleon narrow epimera not protruding; telson (Fig. 44) sides slightly concave, apex broadly rounded; antenna (Fig. 45) rather short, flagellum joints of about equal length; peraeopod 1 carpus (Fig.



Figs 44-48. — *Arcangeloscia puylaerti* n. sp.; ♀: pleopod 1 exopodite (Fig. 46); ♂: telson (Fig. 44), antenna (Fig. 45), peraeopod 1 carpus (Fig. 47), pleopod 1 exopodite (Fig. 48).

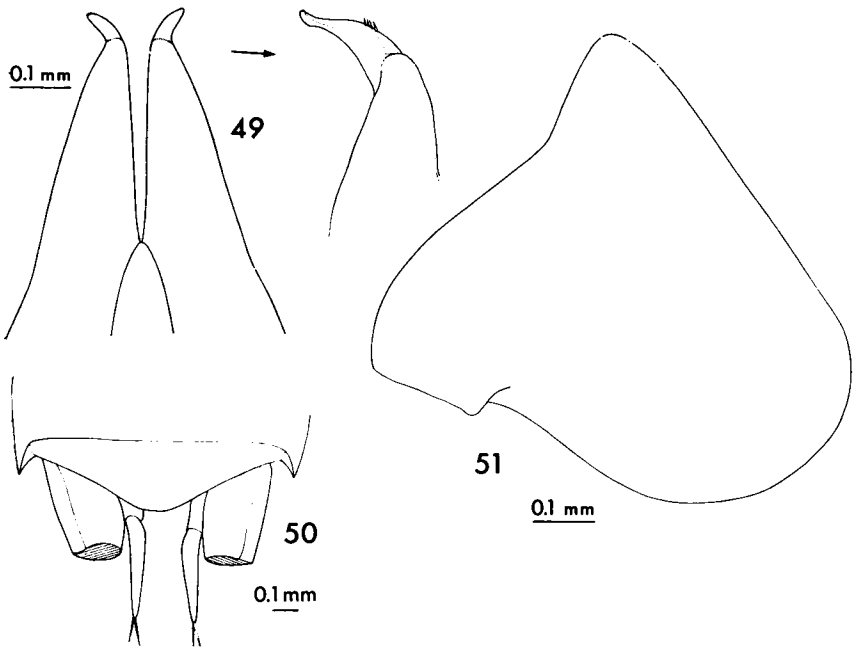
47) with a weakly developed frontal hair field and a few long ventral spines; peraeopod 7 missing; pleopods exopodite 1 (Fig. 48) with an obliquely truncated inner lobe; no recognizable respiratory area; endopodite 1 (Fig. 49) with a knife-like outward pointing distal protuberance

(perhaps a seasonal character); uropod protopodite surpassing point of telson; exopodites missing; pleopods 1 and 2 of the male and female differ in shape.

Allotype: ♀, with empty marsupium, 7 mm long. Ngaoundere.

Peraeopod 1, ♂ ♀, identical; pleopod exopodite 1 not truncated (Fig. 46).

Paratype: ♀, 5 mm long, Ngaoundere.



Figs 49-51. — *Arcangeloscia puylaerti* n. sp. ♂: pleopod 1 endopodite (Fig. 49). *Arcangeloscia* sp. ♀: telson (Fig. 50), pleopod 1 exopodite (Fig. 51).

Remarks. - The ♀ from Victoria corresponds to the ♀ ♀ from Ngaoundere apart from being colourless (probably due to conservation). Though labelled « *Philoscia ingenua* Arc. » no description exists under this name.

4. *Arcangeloscia* sp.

Specimen examined. - Fernando Poo: Moka, 1300-1400 m; 1 ♀ with empty marsupium, 7 mm long, (M.G.), leg. L. Fea, II.1902.

Remarks. - Though this species closely resembles *A. buettneroides*, differences in the shape of the pleopod exopodite 1 (Fig. 51) and telson (Fig. 50) suggest that it might be a different species. The d/c and b/c co-ordinates are shown in Fig. 52.

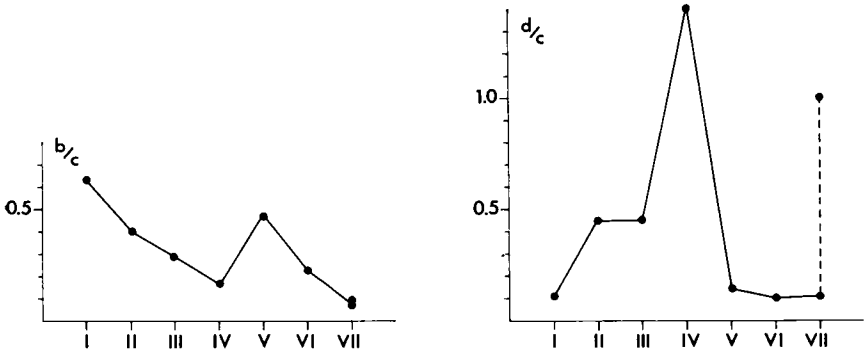


Fig. 52. — *Arcangeloscia* sp.: b/c and d/c co-ordinates.

B. Genus CHAETOPHILOSCIA Verhoeff, 1908

1. ? *Chaetophiloscia guernei* (Dollfus, 1887).

? *Philoscia Guernei* DOLLFUS, 1899, p. 256.

Records from West Africa. - ? Senegal (cf. DOLLFUS, 1899).

Distribution. - Azores.

Remarks. - This record must be cancelled from the West African fauna.

C. Genus CONGOPHILOSCIA Arcangeli, 1950

Type-species: *Congophiloscia albofasciata* Arcangeli, 1950.

According to ARCANGELI (1950a, p. 74), the genus *Congophiloscia* which he instituted for the species *albofasciata* from Zaire is characterized by the presence of a respiratory area in the first two pleopod-exopodites. Among our material are four species which, despite some differences from the original description, probably pertain to *Congophiloscia* due to the presence of such a respiratory area.

Diagnosis. - Gland pores on the peraeon segments (not seen in *C. saothomensis* n.sp. and, after ARCANGELI, absent in *C. albofasciata*); peraeon segment 7 with two *noduli laterales* on each side: d/c co-ordinates show two maxima in the second and fourth peraeon segments (see Figs 53, 62, 73, 81); frontal and supra antennal lines absent; pleon epimera with very short posterior points; molar process of mandible with several penicils; maxillulae with cleft teeth on the outer branch, inner branch without posterior point; maxilliped with a tiny penicil in an invagination of the endite; pleopod exopodite 1 or 1-2 with a semilunar respiratory area; uropod endopodites inserted proximally to exopodites.

1. *Congophiloscia albofasciata* Arcangeli, 1950.

Congophiloscia albofasciata ARCANGELI, 1950a, p. 72, figs.

Records from West Africa. - Cabinda (ex-Portuguese Congo): Sassa-Zao (« Sarra-Zao », printing error?).

Distribution. - Also Zaire (ARCANGELI, 1950a) and Angola (BRIAN, 1953).

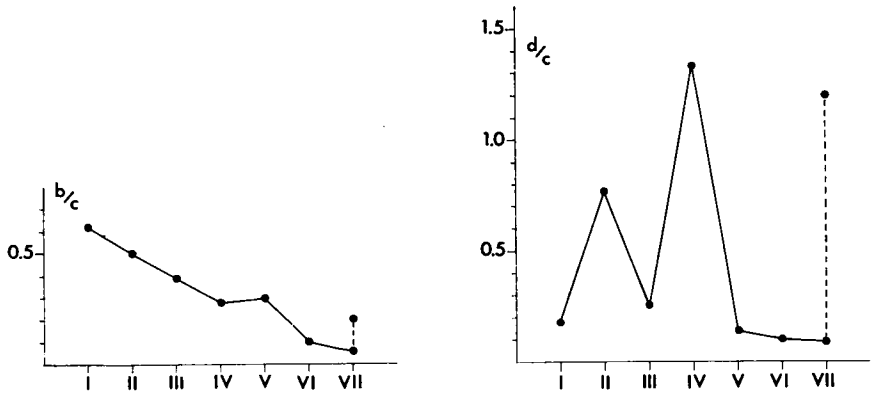
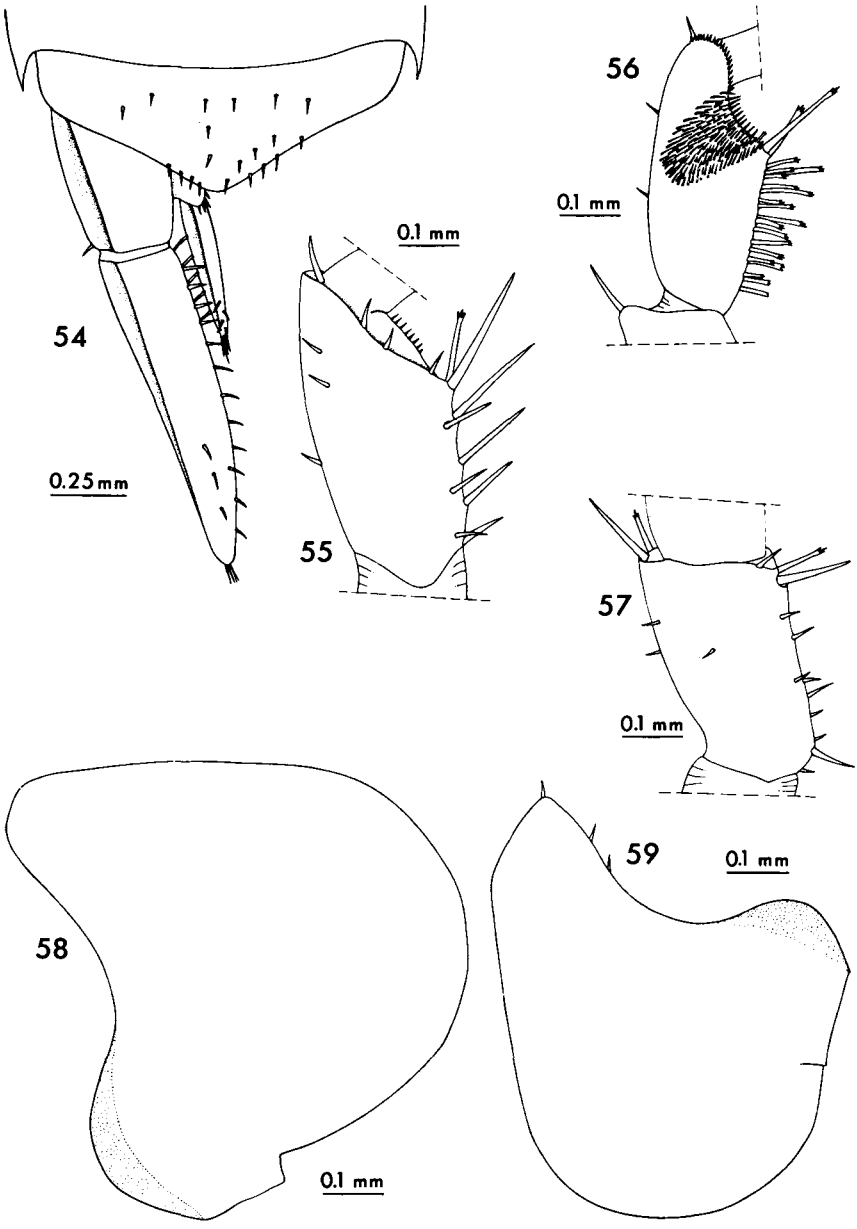


Fig. 53. — *Congophiloscia annobonensis* n. sp.: b/c and d/c co-ordinates.

2. *Congophiloscia annobonensis* n.sp.

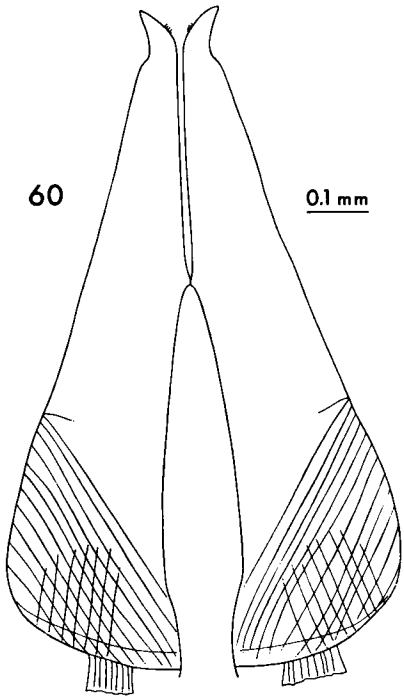
Specimens examined. - Annobon islands: 1 ♂, 5.8 mm long, (B.M. No. 21), leg. Univ. Cambridge Expedition, July-August 1959; 1 ♂, 7 mm long, 4 ♀ ♀ with empty marsupium, 7-8 mm long, 1 ♀ without marsupium, 6.5 mm long, (M.G.), leg. L. Fea, XI.1902.

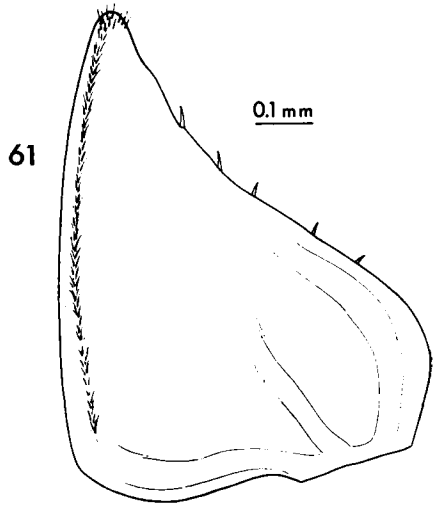


Figs 54-59. — *Congophiloscia annobonensis* n. sp.; ♂: telson and left uropod (Fig. 54), peraeopod 1 carpus (Fig. 56), peraeopod 7 merus (Fig. 57), pleopod 1 exopodite (Fig. 59); ♀: peraeopod 1 carpus (Fig. 55), pleopod 1 exopodite (Fig. 58).

Description. - Holotype ♂, 5.8 mm long, leg. Univ. Cambridge Expedition.

Back brown with yellowish muscle spots, a pronounced row of yellow spots at base of epimera, colourless rim of peraeon epimera; dorsal parts smooth with short upright setae; epimeral furrows and gland pores present; position of *noduli laterales* as in Fig. 53; frontal and supra-antennal lines absent; eyes with about 22 ommatides arranged in four





Figs 60, 61. — *Congophiloscia annobonensis* n. sp. ♂: pleopod 1 endopodite (Fig. 60), pleopod 2 exopodite (Fig. 61).

longitudinal rows; pleon narrow with epimera visible from above; telson (Fig. 54) with slightly concave sides and rounded apex; antenna medium sized, distal joint of peduncle 1.6 mm, flagellum (without terminal sensory organ) 1.4 mm; ratio of flagellum joints (from proximal to distal) is 1.5: 1.0: 1.7; entire antenna equipped with upright setae, densest on flagellum; peraopod 1 carpus (Fig. 56) with usual frontal brush and ventral field of strong, terminally cleft spines diminishing proximally; peraepod

7 (Fig. 57) not specialized; pleopod exopodite 1 (Fig. 59) obliquely truncated medially, laterally with pronounced respiratory area; endopodite 1 (Fig. 60) terminally curved outwards with pointed apex, medially with a group of tiny setae; exopodite 2 without a true respiratory area (Fig. 61); uropod (Fig. 54) protopodite surpassing apex of telson.

Allotype ♀ with empty marsupium, 8 mm long, leg. L. Fea.

Pleopods differ in the two sexes (exopodite 1 see Fig. 58); peraeopod 1 carpus (Fig. 55) has a ventral row of pointed spines in the ♀ and a field of cleft spines in the ♂ (Fig. 56).

3. *Congophiloscia bolamae* n.sp.

Specimens examined. - Guinea Bissau: Bolama, 1 ♂, 5.5 mm long, 10 ♀♀ with marsupium, 6-8 mm long, 3 ♀♀, without marsupium, 6-8 mm long, (M.G.), leg. L. Fea, VI-XII.1899.

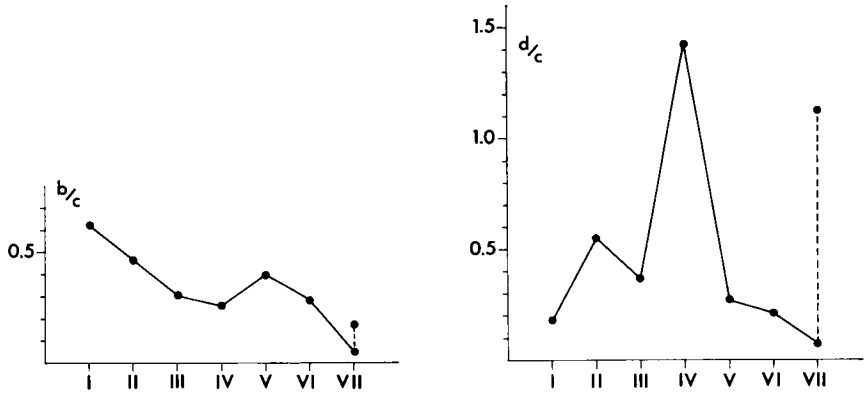
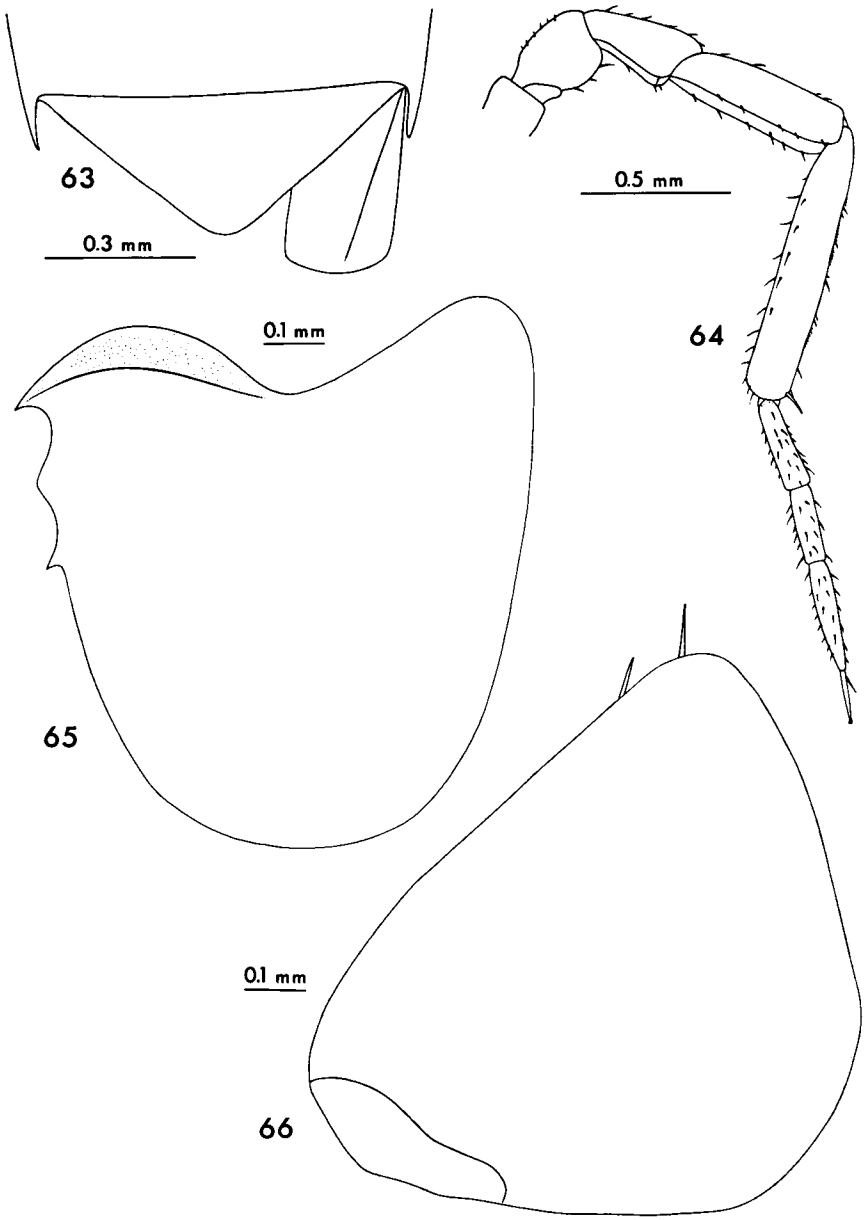


Fig. 62. — *Congophiloscia bolamae* n. sp.: b/c and d/c co-ordinates.

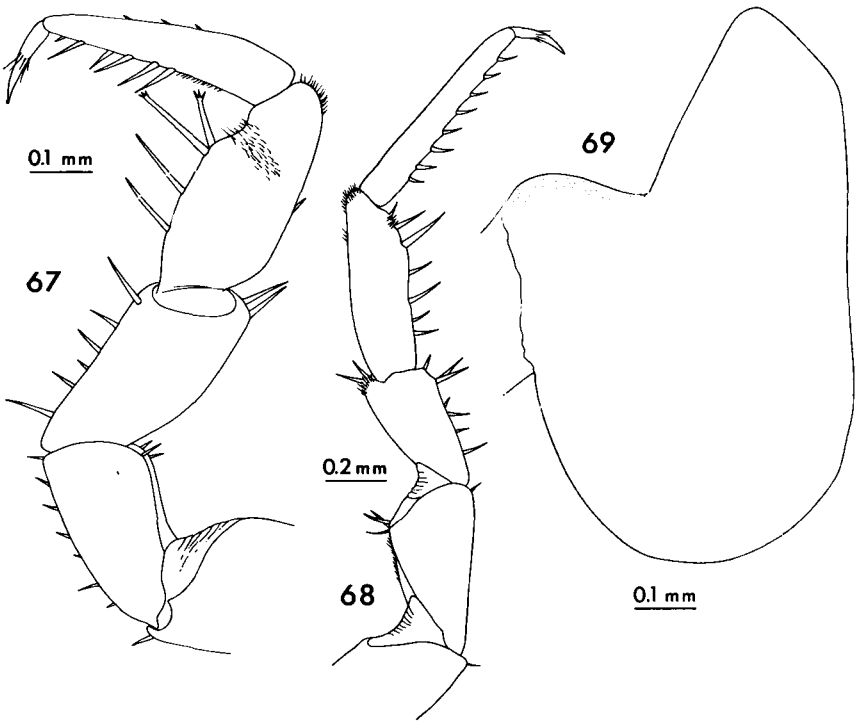
All the specimens, in rather poor condition, are missing the uropod-exopodites and are faded to a uniform yellowish colour, surely not the colouration of the living animal.

Description. - Back smooth with no setae (perhaps due to long conservation); peraeon segments with a narrow shallow *sulcus marginalis* and some gland pores; for position of *noduli laterales* see Fig. 62; peraeon sharply separated from pleon which is very narrow and without laterally extended epimera; frontal and supra-antennal lines absent; eyes with 20 (♂) - 24 (large ♀) ommatides; telson (Fig. 63) with straight (♂) or



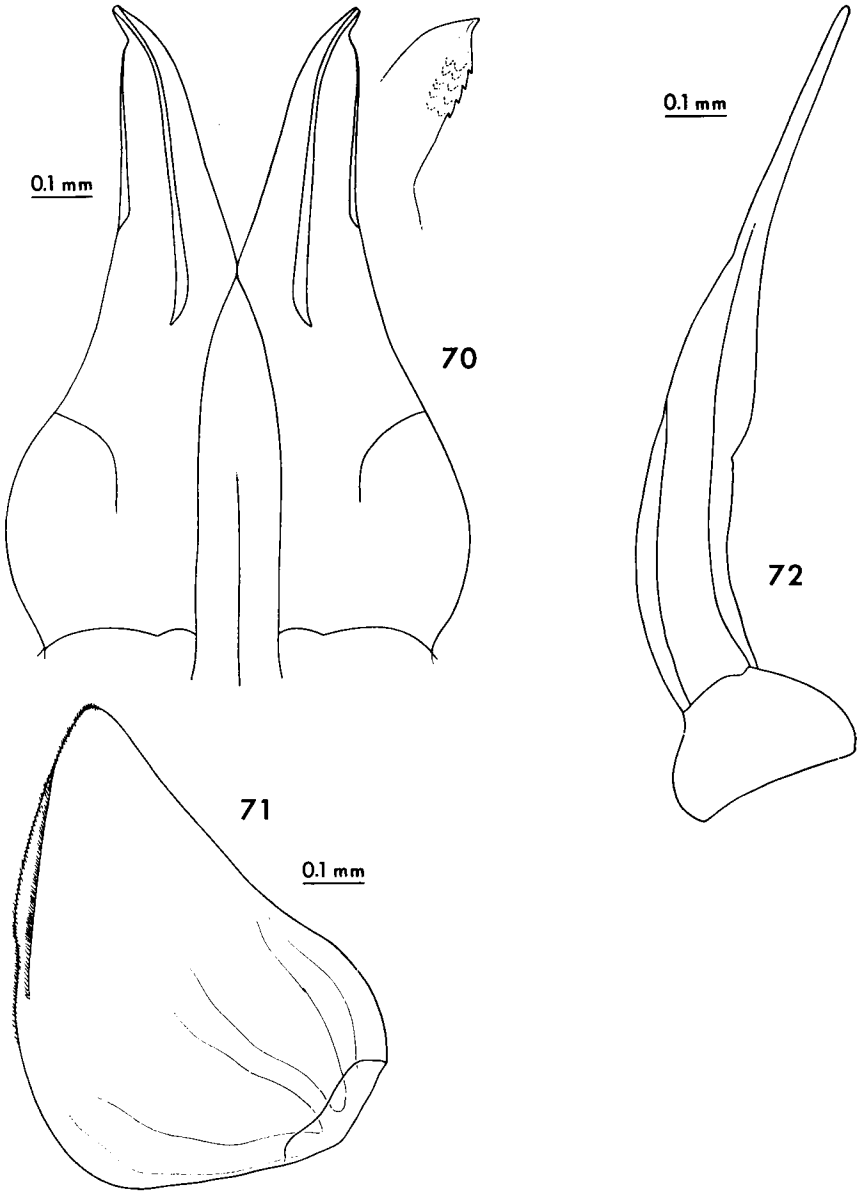
Figs 63-66. — *Congophiloscia bolamae* n. sp.; ♂: telson (Fig. 63), antenna (Fig. 64); ♀: pleopod 1 exopodite (Fig. 65), pleopod 2 exopodite (Fig. 66).

slightly concave (♀) sides and rounded apex; antenna (Fig. 64) long and slender with distal (♂) and proximal (♀) joint of flagellum slightly longer than the other two; peraeopod 1 (Fig. 67) as in other species of Philosciidae with frontal groove and concavity in the outline of the carpus (cleaning device for antenna); peraeopod 7, ♂ (Fig. 68) with fine distal brushes, missing in the ♀; pleopods with a semilunar respiratory area



Figs 67-69. — *Congophiloscia bolamae* n. sp. ♂: peraeopod 1 (Fig. 67), peraeopod 7 (Fig. 68), pleopod 1 exopodite (Fig. 69).

in exopodites 1 as described in *Congophiloscia albofasciata* (ARCANGELI, 1950a, p. 74); exopodite 1, ♂ (Fig. 69), with truncated distal lobe; endopodite 1 (Fig. 70) with narrow outward pointing apex and no apical setae; exopodite 2 (Fig. 71) with *sulcus* at medial margin bordered by two rows of small setae; endopodite 2 see Fig. 72; exopodites 1-2, ♀ (Figs 65, 66); uropod protopodite surpassing point of telson (Fig. 63); exopodite missing in all specimens.



Figs 70-72. — *Congophiloscia bolamae* n. sp. ♂: pleopod 1 endopodite (Fig. 70), pleopod 2 exopodite (Fig. 71), pleopod 2 endopodite (Fig. 72).

4. *Congophiloscia longiantennata* n.sp.

Specimens examined. - Cameroon: 30 km E Campo, rain forest, 4 ♂♂, 7-8.5 mm long, (n. 156, 157 M.F.), leg. E. Kohler, 16.III.1973.

Description. - Holotype ♂, 8.5 mm long (n. 156 M.F.).

Back violet-brown with the usual yellowish muscle insertions, uropod protopodites, proximal joints of antennal peduncle, distal half of distal peduncle joint and hind corners of peraeon epimera whitish; back smooth with very few setae on peraeon tergites; peraeon epimera with some gland pores; for d/c, b/c co-ordinates see Fig. 73; forehead with a swelling

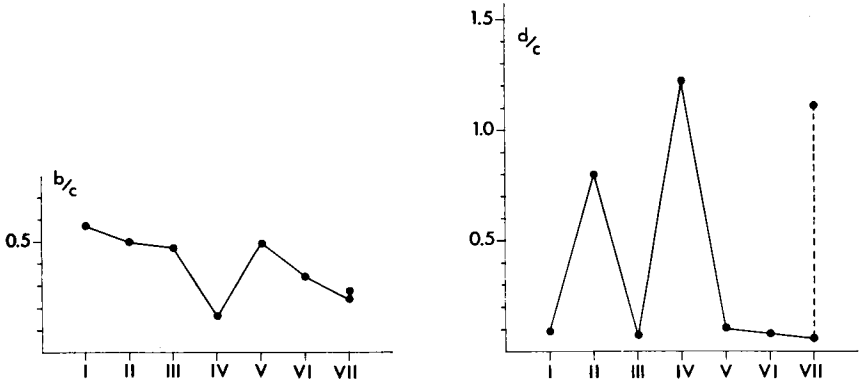
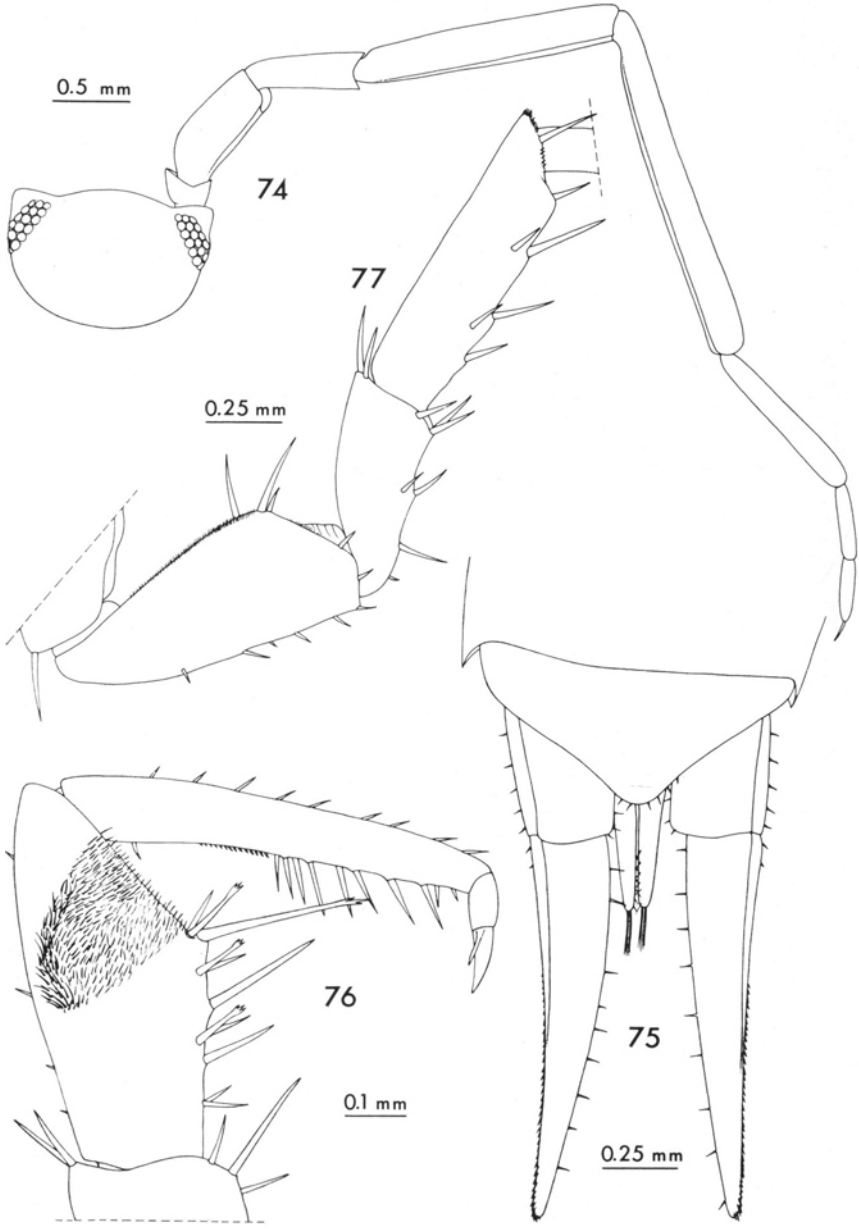
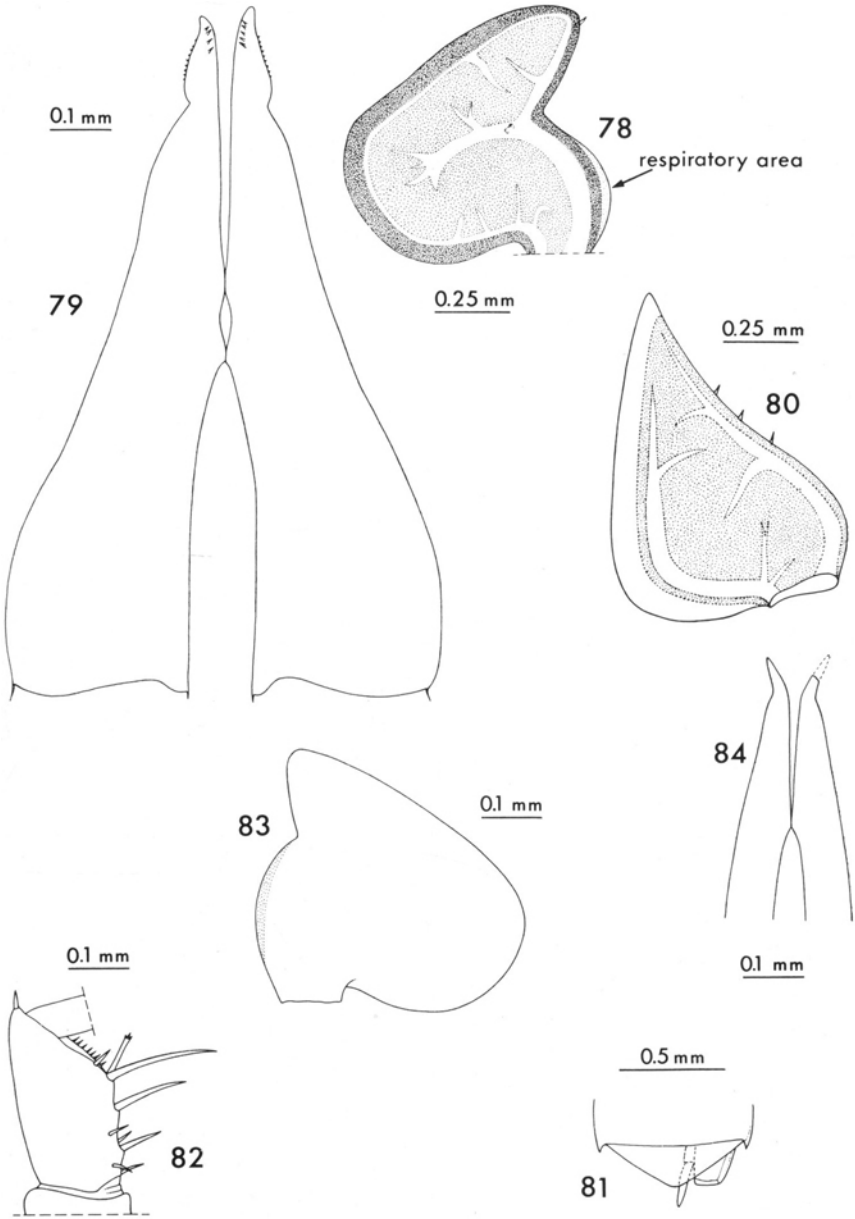


Fig. 73. — *Congophiloscia longiantennata* n. sp.: b/c and d/c co-ordinates.

which simulates a frontal line, not really present; supra-antennal line absent; « frontal margin » and eyes armed with a number of upright setae; eyes with about 22 ommatides much bigger caudally than frontally (Fig. 74); pleon very narrow, epimera not protruding laterally; telson (Fig. 75) with slightly concave sides and narrowly rounded apex; antenna (Fig. 74) extremely long, reaching backward beyond the peraeon 7 tergite, and entirely covered with upright setae; flagellum with proximal joint slightly longer than the two distal joints together, both of about equal length; maxilliped bearing a penicil; peraeopod 1 carpus (Fig. 76) with an extremely well-developed brush with hairs which dorsally reach a length equal to the width of the carpus; peraeopod 7 (Fig. 77) without any marked specialization; pleopod exopodite 1 (Fig. 78) with a rounded triangular inner lobe, a respiratory area as described in *C. albofasciata* and a « lacunary » system similar to that of *C. albofasciata* (ARCANGELI, 1950a, fig. 272); exopodite 2 (Fig. 80) without respiratory area but with « lacunary » system as in exopodite 1; endopodite 1 (Fig. 79) with a point separated by a lateral incision, armed with a longitudinal row of short setae; uropod



Figs 74-77. — *Congophiloscia longiantennata* n. sp. ♂: cephalon and right antenna (Fig. 74), telson and uropods (Fig. 75), peraeopod 1 carpus (Fig. 76), peraeopod 7 (Fig. 77).



Figs 78-84. — *Congophiloscia longiantennata* n. sp. ♂: pleopod 1 exopodite (Fig. 78), pleopod 1 endopodite (Fig. 79), pleopod 2 exopodite (Fig. 80). *Congophiloscia saothomensis* n. sp. ♂: telson (Fig. 81), peraeopod 1 carpus (Fig. 82), pleopod 1 exopodite (Fig. 83), pleopod 1 endopodite (Fig. 84).

exopodite long, curved slightly outward; protopodite surpassing telson; protopodite and exopodite furrowed laterally.

Paratypes: 3 ♂♂, 7 8 mm long (n. 157 M.F.), with same characters and colouration as holotype.

Females unknown.

Remarks. - For the presence of a clearly developed respiratory area in the pleopod 1 exopodite, this species — and the others — are ascribed to the genus *Congophiloscia* although there is no such respiratory area in the pleopod 2 exopodite. At any rate, *C. longiantennata*, and the other species of *Congophiloscia* described here, constitute an homogeneous group due to their other characters which cannot be divided into different genera. The species *C. longiantennata* differs from all other known African Philosciids in the extremely long antennae and specific structure of the male pleopod 1 endopodites.

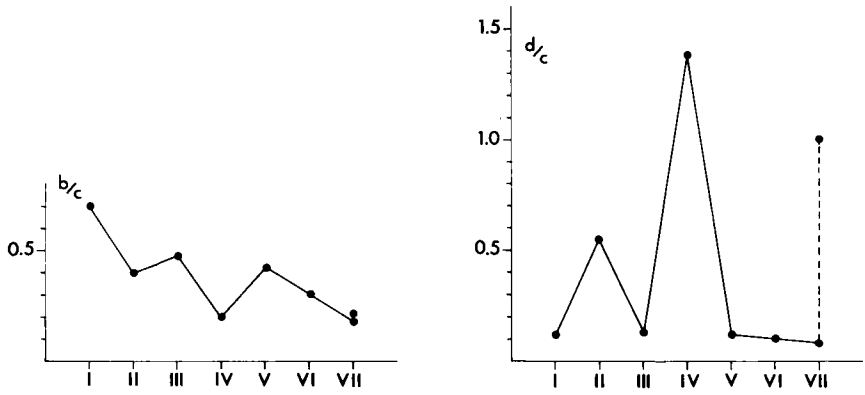


Fig. 85. — *Congophiloscia saothomensis* n. sp.: b/c and d/c co-ordinates.

5. *Congophiloscia saothomensis* n.sp.

Specimens examined. - Sao Thome: Zampalma, 1 ♂ ca 4.5 mm long (head missing), 1 ♀ skeleton 4 mm long, (B.M.), leg. Oxford Univ. Expedition (pres. J. Galbraith), 13.IX.1949.

Description. - Holotype ♂, 4.5 mm long.

Colourless (perhaps due to conservation) except for a brown medial band on the pleon; dorsally smooth without setae except a few on pleon; rim of peraeon epimera with a row of short stiff setae, no visible gland pores; for d/c, b/c co-ordinates see Fig. 85; cephalothorax missing in the specimen; pleon very narrow, epimera not visible from above; telson (Fig. 81) with straight sides and broadly rounded apex; antenna missing; peraeopod 1 carpus (Fig. 82) with usual frontal brush, ventrally with a

row of four strong pointed spines declining proximally and the usual distal cleft spine, ventrolaterally with a few small spines; peraeopod 7 not specialized; pleopod 1 exopodite (Fig. 83) with a distinct angle between medial lobe and distal part; very marrow respiratory area; endopodite 1 (Fig. 84) with narrow sharply pointed apex turned outwards; exopodite 2 without respiratory area and with lacunary system; uropod protopodites slightly surpassing telson apex; exopodites broken off.

The ♀ skeleton from the same locality very probably belongs to the same species. In addition to the non-sexual characters described in the ♂, frontal and supra-antennal lines are absent; eyes with about 13 ommatides; antenna slender, medium sized with upright setae and second joint of flagellum shortest. Due to its bad condition, the specimen cannot be assigned as allotype.

D. Genus GABUNOSCIA n. gen.

Diagnosis. - Some gland pores on the peraeon epimera; d/c co-ordinates with two maxima (II and IV); two *noduli laterales* on the seventh segment; frontal and supra antennal lines absent; pleon epimera not visible from above; molar penicil of the mandible dichotomized; maxillula with some cleft teeth on the outer branch; inner branch without posterior spine; maxilliped with setose endite, no penicil; uropod endopodite arising proximal to exopodite.

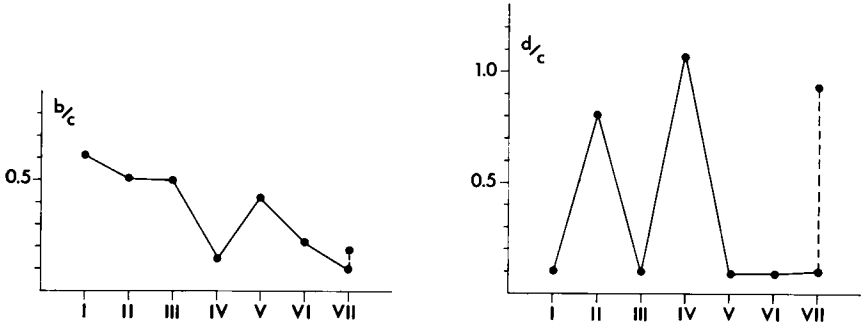
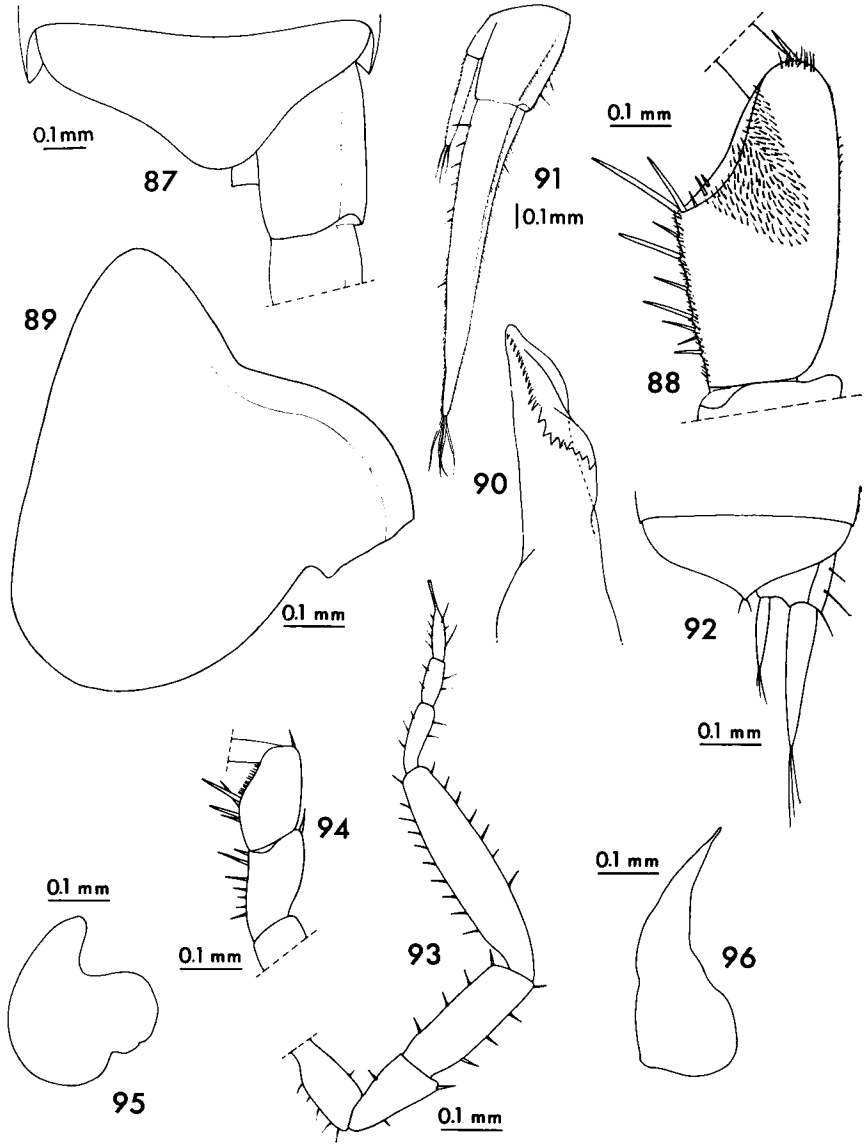


Fig. 86. — *Gabunoscia feai* n. sp.: b/c and d/c co-ordinates.

1. *Gabunoscia feai* n.sp.

Specimen examined. - Gabun: Lambarené, 1 ♂, 9 mm long, (M.G.), leg. L. Fea, 1902.

Description. - Back smooth with no setae (perhaps lost because of long conservation); peraeon segments with *sulcus marginalis* and some



Figs 87-96. — *Gabunoscia feai* n. sp. ♂: telson (Fig. 87), peraeopod 1 carpus (Fig. 88), pleopod 1 exopodite (Fig. 89), pleopod 1 endopodite (Fig. 90), right uropod (Fig. 91). *Rennelloscia kohleri* n. sp. ♂: telson and right uropod (Fig. 92), antenna (Fig. 93), peraeopod 1 (Fig. 94), pleopod 1 exopodite (Fig. 95), pleopod 1 endopodite (Fig. 96).

gland pores; for d/c, b/c co-ordinates see Fig. 86; frontal and supra-antennal lines absent; eyes with about 23 ommatides; pleon very narrow, epimera not protruding laterally; telson (Fig. 87) with concave sides and rounded apex; antenna missing; maxillula with 8 teeth on outer branch the inner 3 with an additional point; peraeopod 1 with broad carpus, distal concavity of the outline reaching nearly half the length of the carpus (Fig. 88); peraeopod 7 without special modifications; pleopod 1 exopodite with triangular inner lobe (Fig. 89); endopodite 1 with a nearly straight point, somewhat obliquely truncated and carrying a semilunar medial swelling (Fig. 90); uropod exopodite long, curved slightly outwards (Fig. 91).

E. Genus PLEOPODOSCIA Verhoeff, 1942

Type-species: *Pleopodoscia isabelensis* Verhoeff, 1942.

This genus, close to *Chaetophiloscia* (VERHOEFF, 1942, p. 95), is characterized by the insertions of the uropod exo- and endopodite (endopodite arising proximal to exopodite) and by the very large exopodite of the male pleopod 1. Though in addition to *P. isabelensis*, other species have been assigned to this genus (SCHMOELZER, 1974; FERRARA, 1974), a better diagnosis is necessary which can be made only after a careful check of the type-material.

1. *Pleopodoscia isabelensis* Verhoeff, 1942.

Pleopodoscia isabelensis VERHOEFF, 1942, p. 95, figs.

Records from West Africa. - Fernando Poo.

Distribution. - Known only from the type locality.

F. Genus RENNELLOSCIA Vandel, 1970

Type-species: *Rennelloscia wolffi* Vandel, 1970.

VANDEL (1970, p. 143) instituted this genus for two Melanesian species, later describing other species from Melanesia, Assam and Nepal. FERRARA (1975) described another species of *Rennelloscia* from Somalia (1).

Diagnosis. - Gland pores on the peraeon segments (except in *R. panaiensis* Vandel, 1973 and *R. kohleri* n.sp.); d/c co-ordinates of *noduli*

(1) In FERRARA (1975) the genus *Rennelloscia* was wrongly spelled as *Renelloscia*.

laterales with two maxima on peraeon segments 2, 4; smooth teguments; without frontal and with supra-antennal line; pleon epimera practically invisible from above; telson triangular; mandible with simple molar penicil; outer branch of maxillula with some cleft teeth; maxilliped endite with a penicil; uropod exo- and endopodite inserted at the same level.

1. *Rennelloscia kohleri* n.sp.

Specimens examined. - Cameroon: 20 km W Victoria, 5 ♂♂, 2-2.7 mm long, 1 ♀ with marsupium 3.1 mm long, (n. 158-160 M.F.), 10. III.1973, leg. E. Kohler.

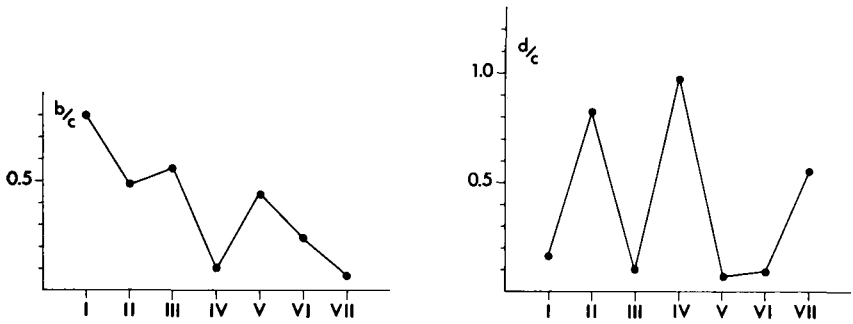


Fig. 97. — *Rennelloscia kohleri* n. sp.: b/c and d/c co-ordinates.

Description. - Holotype ♂ 2.7 mm long (n. 158 M.F.).

Back light violet-brown with whitish muscle spots, antenna colourless; few long upright dorsal setae; gland pores not seen; d/c, b/c co-ordinates see Fig. 97; without frontal and with supra antennal line; eyes with 5 ommatides; pleon narrow, epimera not protruding laterally; telson (Fig. 92) with very concave sides and acutely pointed apex; antenna (Fig. 93) moderately long, distal joint of peduncle thickset; flagellum with proximal joint longest; peraeopod 1 carpus (Fig. 94) with only a few ventral spines, frontally with a brush of long hairs forming the antennal cleaning apparatus; pleopod 1 exopodite (Fig. 95) with a pronounced inner lobe bent laterally; endopodite 1 (Fig. 96) bent outwardly, apex acutely pointed; uropod protopodite (Fig. 92) barely surpassing tip of telson, endo- and exopodites inserted at nearly the same level; peraeopods of ♂ and ♀ do not differ in shape.

Allotype: ♀ with marsupium, 3.1 mm long (n. 159 M.F.), differing from ♂ only in the shape of the pleopods.

Paratypes: 4 ♂♂, 2-2.5 mm long (n. 160 M.F.).

Remarks. - The presence of a ♀ with marsupium proves that the type specimens are adult. Keys for this species are shape of the telson and first male pleopod, as well as the small size.

G. Genus Togoscia n. gen.

Diagnosis. - Some gland pores on peraeon segments; peraeon 7 segment with two *noduli laterales* on each side; d/c co-ordinates with two maxima (II and IV segments); b/c with maximum on II (in contrast to all the other species); frontal and supra antennal lines absent; pleon epimera well developed, clearly visible from above; mandible with molar penicil dichotomized; maxillula with cleft teeth on outer branch; inner branch without posterior point; maxilliped with spinose endite bearing a penicil; uropod exo- and endopodite inserted at the same level.

Remarks. - The institution of the new genus, even if based on the examination of female-specimens alone, is justified as these belong to two species showing a series of peculiar characters. However, due to the lack of males, we preferred not to describe the species in order to avoid future confusion.

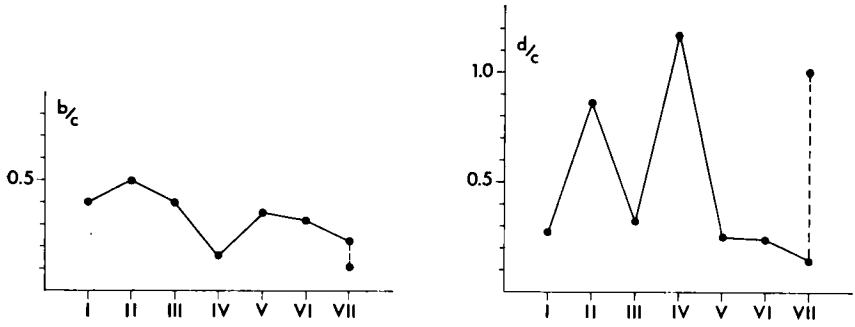


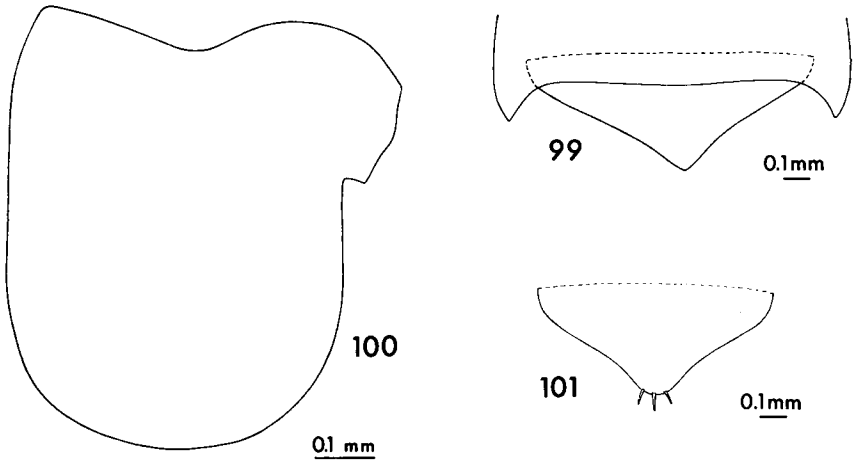
Fig. 98. — *Togoscia* sp. I ♀: b/c and d/c co-ordinates.

1. *Togoscia* sp. I.

Specimen examined. - Togo: Mt Agou, sommet, savane 1020 m, 1 ♀ without oostegites, 6.5 mm long, (M.R.A.C.), leg. Y. Due, 26. VI.1963.

Description. - Back violet-brown with usual muscle spots; no setae on smooth dorsal parts; peraeon with very slight epimeral furrows and some gland pores; for d/c, b/c co-ordinates see Fig. 98; frontal and supra-antennal lines absent; eyes with about 22 ommatides; telson with concave

sides and very narrowly rounded apex (Fig. 99); antenna missing; pleopods with no respiratory area on exopodites; exopodite 1 (Fig. 100) with parallel sides (in contrast to the other species studied in this paper); uropod missing exopodites.



Figs 99-101. — *Togoscia* sp. I ♀: telson (Fig. 99), pleopod 1 exopodite (Fig. 100). *Togoscia* sp. II ♀: telson (Fig. 101).

2. *Togoscia* sp. II.

Specimen examined. - Ghana: Bunsu (N of Accra), rain forest, 1 ♀, 7 mm long, (n. 161 M.F.), leg. K. Pfau, 10.IV.1971.

Remarks. - Very similar to the preceding species from which it is readily distinguished by the different shape of the telson (Fig. 101). For d/c, b/c co-ordinates see Fig. 102.

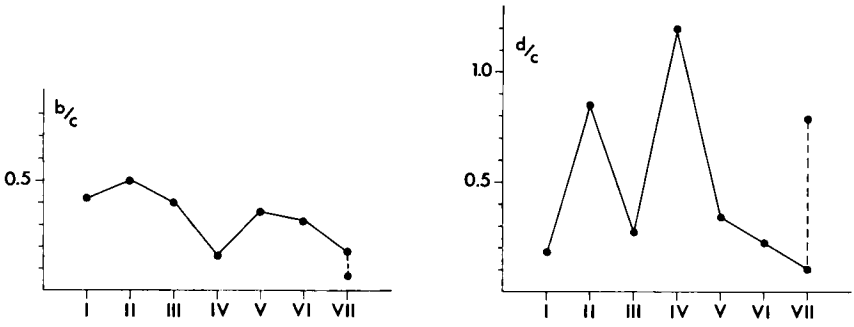


Fig. 102. — *Togoscia* sp. II ♀: b/c and d/c co-ordinates.

H. Genus VANDELOPHILOSCIA n. gen.

Diagnosis. - Similar to *Arcangeloscia* with the exception of no gland pores; maxillula without cleft teeth on the outer branch; inner branch with strong posterior spine; maxilliped endite not spinose and without penicil. The slight eccentricity of the nodulus 2 may be a generic character, as is the conspicuous brush oh spines on the first and second male peraeopods.

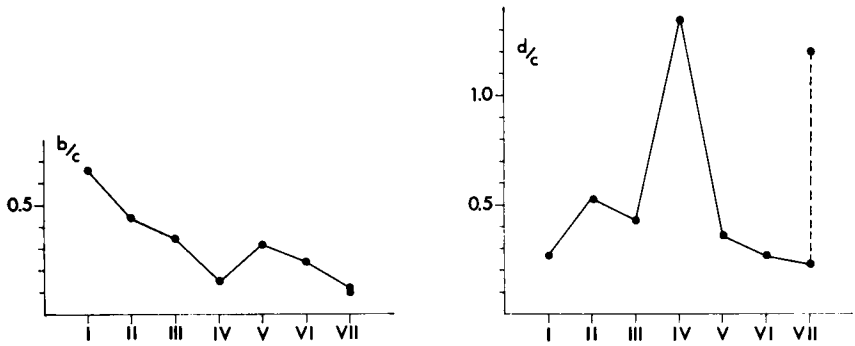


Fig. 103. — *Vandelophiloscia pfaui* n. sp.: b/c and d/c co-ordinates.

1. *Vandelophiloscia pfaui* n.sp.

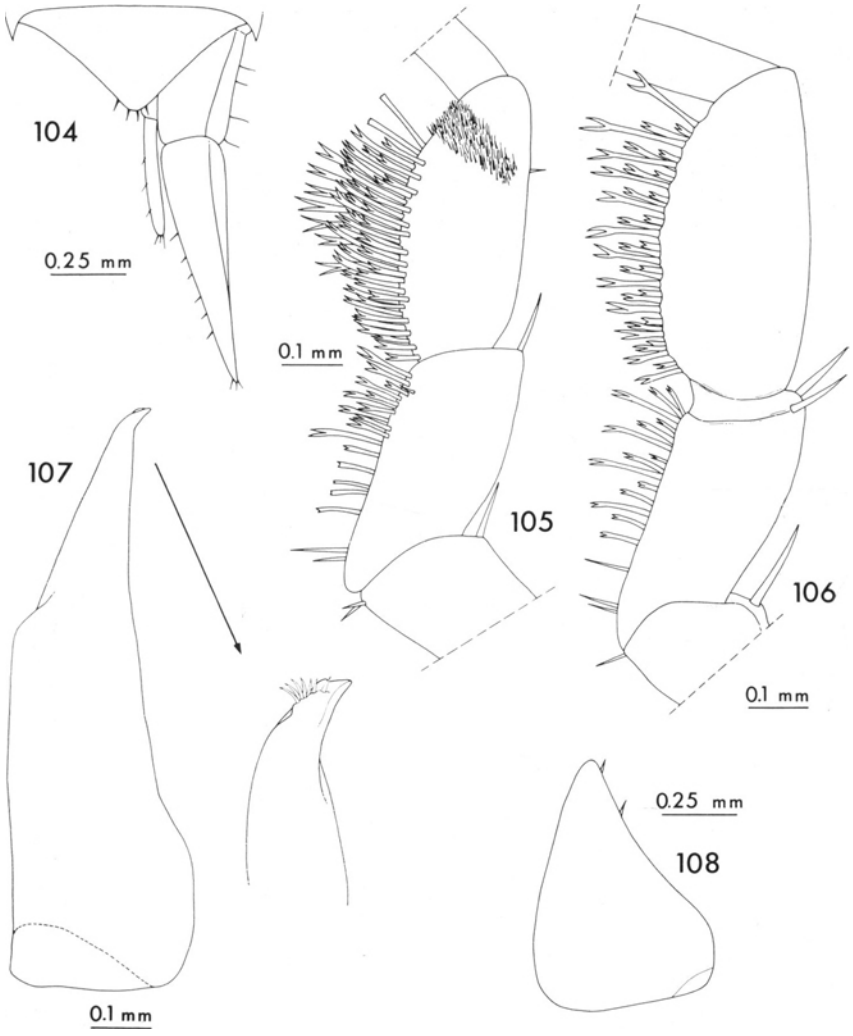
Specimen examined. - Ivory Coast: Satikran, near Abengourou, rain forest, 1 ♂, 6 mm long, (n. 162 M.F.), leg. K. Pfau, 14.IV.1971.

Description. - Holotype: ♂, 6 mm long (n. 162 M.F.).

Back violet-brown with usual yellowish muscle spots; lateral parts of epimera colourless; dorsal parts smooth covered with short upright setae; no gland pores; for d/c, b/c co-ordinates see Fig. 103; frontal and supra-antennal lines absent; eyes with about 10 ommatides; pleon narrow, epimera not protruding laterally; telson (Fig. 104) with slightly concave sides and narrowly rounded apex; antenna missing; peraeopod 1-2 carpus and merus (Figs 105, 106) with conspicuous brushes of strong spines with fork-like cleft distal parts; pleopod 1 exopodite missing; endopodite 1 (Fig. 107) with the apex diverging laterally; exopodite 2 (Fig. 108) without respiratory area; uropod protopodite considerably surpassing telson apex; endopodite inserted at level of telson apex.

Female not known.

Remarks. - The most important key to this species is the dense brush of cleft spines on the merus and carpus of peraeopods 1 and 2.



Figs 104-108. — *Vandelophiloscia pfaui* n. sp. ♂: telson and right uropod (Fig. 104), peraeopod 1 (Fig. 105), peraeopod 2 (Fig. 106), pleopod 1 endopodite (Fig. 107), pleopod 2 exopodite (Fig. 108).

I. Genus ZEBRASCIA Verhoeff, 1942

Type-species: *Zebrascia longicornis* Verhoeff, 1942.

VERHOEFF (1942) created the genus *Zebrascia*, maintaining that it differed from *Chaetophiloscia* by its conspicuous colour-pattern and the

fact that the endopodite and exopodite of the uropods are inserted at the same level. The first difference is, in our opinion, no reason for constituting a new genus for this species while the second is true for same species of *Chaetophiloscia* as well (compare *Ch. magnopunctata*, SCHMALFUSS, 1972, p. 575). Moreover the absence of a penicil on the maxilliped is definitely a mistake. Nevertheless *Zebrascia* is a good genus which can be re-diagnosed as follows: no gland pores on the peraeon segments; peraeon segment 7 with two *noduli laterales* on each side; d/c co-ordinates as in *Rennelloscia* (two maxima on II and IV); not visible supra-antennal line; pleon epimera not visible from above; mandible with simple molar penicil; maxillula with some cleft teeth on outer branch; inner branch with very short thickset penicils, posterior point missing; maxilliped with setose endite bearing a penicil; uropod exo- and endopodites inserted almost at the same level.

1. *Zebrascia buddelundi* n.sp.

Specimens examined. - Cameroon: no locality (« Kamerun ») 5 ♂♂ 4.5-6 mm long, 4 ♀♀ without marsupium 3-4.5 mm long, 8 ♀♀ with marsupium 5.5-8 mm long, (M.S. No. 5697), leg. Sjöstedt, date ? (1891?).

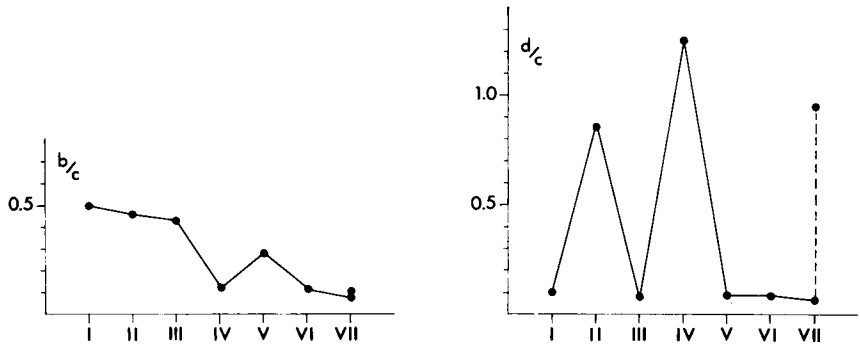


Fig. 109. — *Zebrascia buddelundi* n. sp.: b/c and d/c co-ordinates.

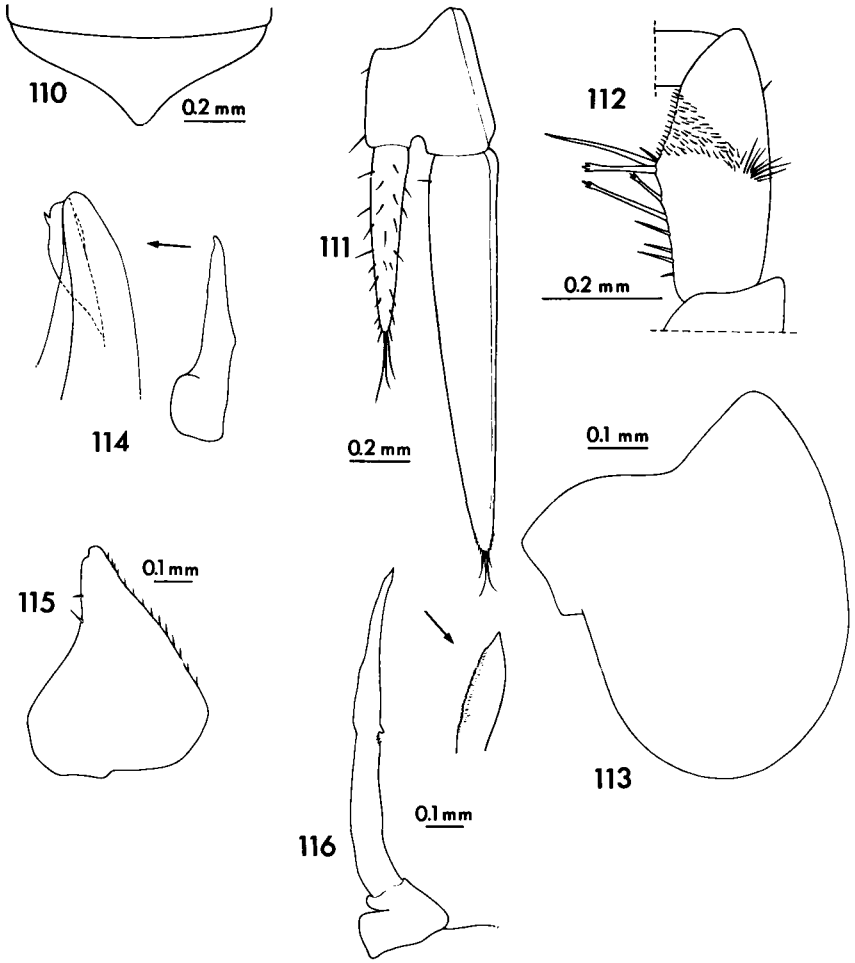
Description. - Holotype ♂ 6 mm long.

Specimen faded by long conservation; few scattered setae on tergites; for d/c, b/c co-ordinates see Fig. 109; frontal and supra-antennal lines absent; eyes with 15 ommatides; telson (Fig. 110) with strongly concave sides and narrowly rounded apex; antenna missing (compare paratypes); peraeopod 1 carpus (Fig. 112) ventrally with a few long cleft spines, fron-

tally with usual antennal cleaning brush, the setae of which are very long at the dorsal end of the groove; peraeopod 7 not specialized; pleopod 1 exopodite and endopodite see Figs 113, 114; pleopod 2 see Figs 115, 116; uropods missing (compare paratypes).

Allotype ♀ with marsupium 7.5 mm long; only pleopods of the ♂ and ♀ differ in shape.

Paratypes: 4 ♂♂ and 13 ♀♀.



Figs 110-116. — *Zebrascia buddelundi* n. sp.; ♀: uropod (Fig. 111); ♂: telson (Fig. 110), peraeopod 1 carpus (Fig. 112), pleopod 1 exopodite (Fig. 113), pleopod 1 endopodite (Fig. 114), pleopod 2 exopodite (Fig. 115), pleopod 2 endopodite (Fig. 116).

The ♀, 5.5 mm long with marsupium has antenna reaching back to the peraeon 5 tergite and the ratio of the flagellum joints from distal to proximal is 15:11:13. The ♀, 8 m long with marsupium has a ~~complete~~ uropod (Fig. 111) in which the exopodite and endopodite are inserted at nearly the same level.

Remarks. - While the specimens were labelled « *Philoscia zonata* Budde Lund », no description of this species seems to have been published.

2. *Zebrascia longicornis* Verhoeff, 1942.

Zebrascia longicornis VERHOEFF, 1942, p. 94 figs; VANDEL, 1968, p. 64 (footnote).

Records from West Africa. - Ivory Coast (VANDEL, 1968), Fernando Poo (VERHOEFF, 1942).

Distribution. - Known only from the above localities.

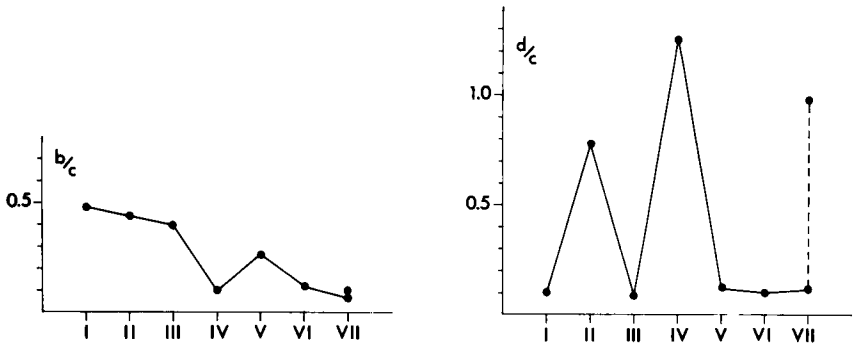
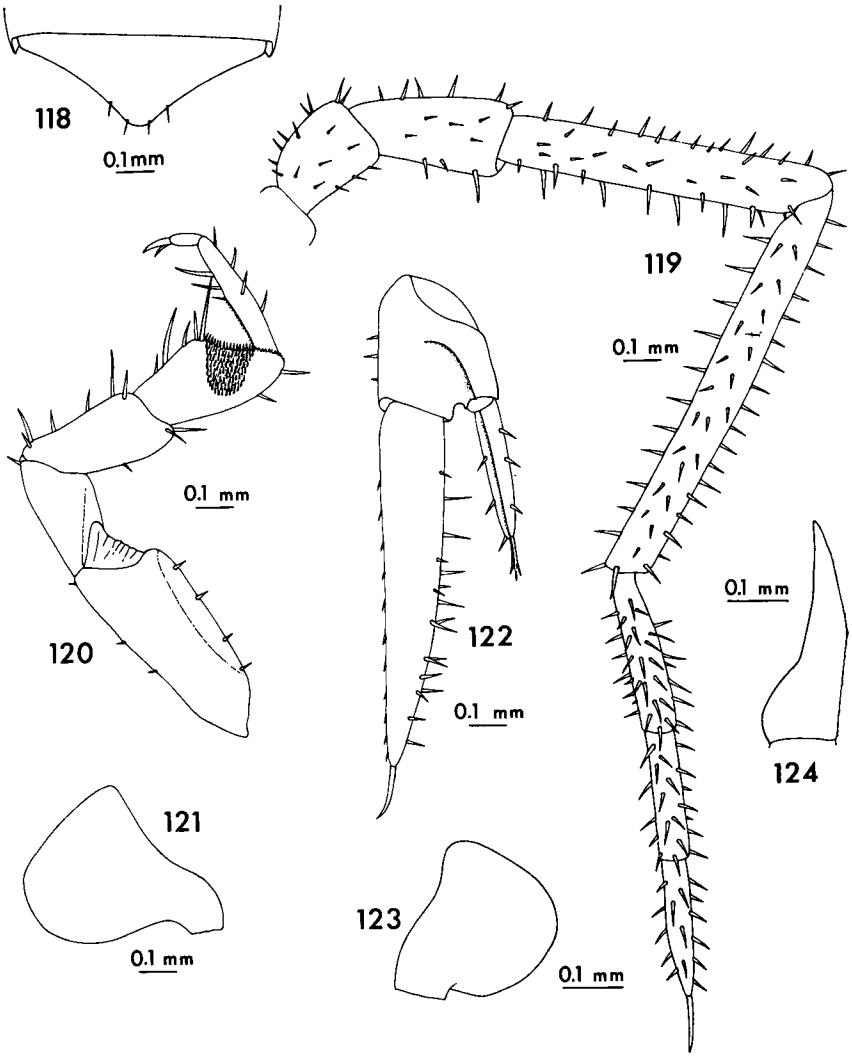


Fig. 117. — *Zebrascia longicornis* Verhoeff: b/c and d/c co-ordinates.

Specimens examined. - Cameroon: Olounou, 1 ♂, 3 mm long, (M.R.A.C.), leg. F. Puylaert, 18.IX.1971; 20 km W Victoria, 4 ♀♀ without marsupium 3.5-5.5 mm long, (n. 163 M.F.), leg. E. Kohler, 10.III.1973.

Description. - Body deep purplish black in the ♀♀, as described by VERHOEFF, with caudal half of head, second, fourth and frontal halves of peraeon tergites 6-7 and uropods white; in ♂ only peraeon tergite 4 and uropods white; no setae on smooth tergites of peraeon and pleon, cuticle covered with scale like microstructures; for d/c, b/c co-ordinates see Fig. 117; frontal and supra-antennal lines absent; eyes with about 10 ommatides in the specimens 3-3.5 mm long (♂ and ♀), with 16 ommatides in the ♀, 5.5 mm long; pleon epimera not visible from above;

telson (Fig. 118) with slightly concave sides and rounded apex (VERHOEFF's fig. 14 shows straight sides but the drawing does not seem to be reliable in this respect); antenna (Fig. 119) with distal joint of the peduncle 1.1 mm long and flagellum 1.15 mm in the ♀, 5.5 mm long. Ratio of the flagellum joints from proximal to distal is 9:7:7. In the ♂ (3 mm) and



Figs 118-124. — *Zebrascia longicornis* Verhoeff; ♀: telson (Fig. 118), antenna (Fig. 119), peraepood 1 (Fig. 120), pleopod 1 exopodite (Fig. 121), uropod (Fig. 122); ♂: pleopod 1 exopodite (Fig. 123), pleopod 1 endopodite (Fig. 124).

♀ (3.5 mm), the distal joint of the flagellum is nearly twice as long as the second, about the same length as the first. Peraeopod 1, ♀ (Fig. 120) 4.2 mm long as in ♂ 3 mm long; peraeopod 7 of ♀ (4.2 mm) and ♂ do not differ; pleopod exopodites with no respiratory area; exopodite 1, ♀ (4.2 mm) see Fig. 121, pleopod 1 ♂ see Figs 123, 124; uropod (Fig. 122) exopodite inserted at the same level as VERHOEFF emphasizes; pleopods of ♂ and ♀ differ in shape.

Remarks. - The ♂ from Olounou is the first ♂ to be described for this species. The record from the Ivory Coast is doubtful since VANDEL (1968) mentions the species and locality in a footnote only without giving a detailed comparison with the original description (based on a single ♀). As well, no terrestrial isopods are presently known to occur in forest areas both east and west of the Nigerian steppe zone.

3. *Zebrascia plurimaculata* n.sp.

Specimens examined. - Cameroon: Victoria, 1 ♂ 5.5 mm long, 1 ♀ without marsupium 3.3 mm long, (M.T.), leg. F. Silvestri, 1-8.I.1913.

Description. - Holotype ♂ 5.5 mm long.

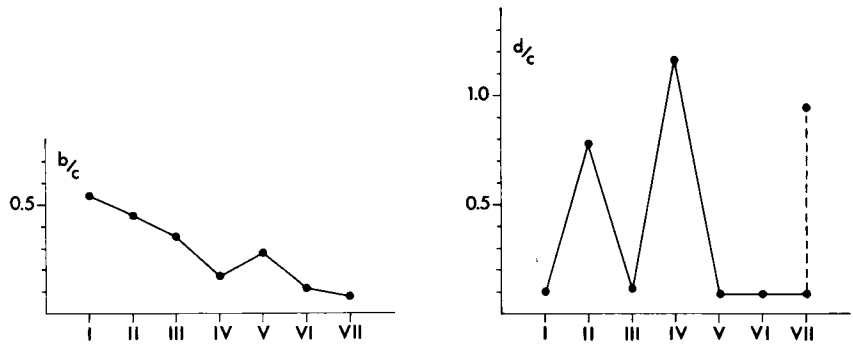
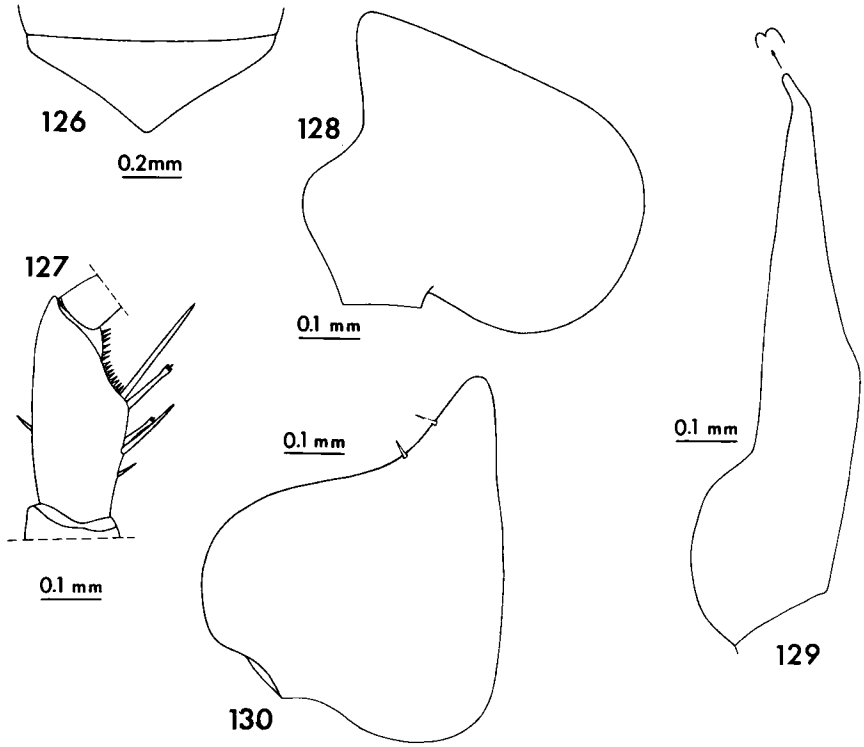


Fig. 125. — *Zebrascia plurimaculata* n. sp.: b/c and d/c co-ordinates.

Colourless, probably due to conservation; however as the specimens were labelled « *Philoscia plurimaculata* » by ARCANGELI, they must have had a distinct colouration; tergites smooth without setae; peraeon with no gland pores; for d/c, b/c co-ordinates, see Fig. 125; frontal and supra-antennal lines absent; eyes with about 19 ommatides; telson (Fig. 126) with straight sides and narrowly rounded apex; antenna medium sized,

distal joint of peduncle 1.0 mm, flagellum 0.75 mm; ratio of flagellum joints 1:1:1; peraeopod 1 carpus (Fig. 127) frontally with usual brush, ventrally with two pointed and with two cleft spines; peraeopod 7 missing; pleopod exopodite 1 (Fig. 128) with parallel sides and a short medial



Figs 126-130. — *Zebrascia plurimaculata* n. sp. ♂: telson (Fig 126), peraeopod 1 carpus (Fig. 127), pleopod 1 exopodite (Fig 128), pleopod 1 endopodite (Fig. 129), pleopod 2 exopodite (Fig. 130).

lobe; endopodite 1 (Fig. 129) with apex turned slightly outwards; exopodite 2 (Fig. 130); uropod protopodites surpassing telson; exo- and endopodite missing but inserted at almost the same level.

Paratype: 1 ♀ without marsupium, 3.3 mm long.

Remarks. - As it is a juvenile, the paratype ♀ is not designated as allotype.

Both specimens, from the Museum of Turin, were labelled « *Philoscia plurimaculata* Arc. » though ARCANGELI did not publish any description.

J. Species of uncertain generic position

All the following species have been described in an unsatisfactory way. They certainly do not belong to the genus *Philoscia* but cannot be ascribed to other genera until the original material has been re-examined. It is quite probable that some of them correspond to species described in this paper.

1. « *Philoscia* » *buettneri* Hilgendorf, 1893.

Philoscia büttneri HILGENDORF, 1893a, p. 154; HILGENDORF, 1893b, p. 176.
? *Philoscia buettneri* PAULIAN DE FÉLICE, 1940a, p. 102, figs.

Record from West Africa. - Togo (HILGENDORF, 1893a, 1893b).

Cameroon: Kribi (HILGENDORF, 1893a); ? N'Kongsamba (PAULIAN DE FÉLICE, 1940a).

Distribution. - Known only from the above localities.

Remarks. - The original description of « *Philoscia* » *buettneri* is so inadequate that it could apply to every species of West African Philosciidae. Thus it is doubtful that PAULIAN DE FÉLICE's specimens belong to the same species as HILGENDORF's (1). Moreover these specimens — after PAULIAN DE FÉLICE — show respiratory areas in the pleopod exopodites, a character typical of *Congophiloscia.*

2. « *Philoscia* » *camerunica* Paulian de Félice, 1940.

Philoscia camerunica PAULIAN DE FÉLICE, 1940a, p. 106, figs.

Records from West Africa. - Cameroon: Mount Cameroon; Mount Etinde (PAULIAN DE FÉLICE, 1940a).

Distribution. - Known only from the type locality.

3. « *Philoscia* » *elephantina* Paulian de Félice, 1940.

Philoscia elephantina PAULIAN DE FÉLICE, 1940a, p. 107, figs.

Records from West Africa. - Ivory Coast: Sassandra; Port Bouet (PAULIAN DE FÉLICE, 1940a).

Distribution. - Known only from the type locality.

4. « *Philoscia* » *lata* Paulian de Félice, 1940.

Philoscia lata PAULIAN DE FÉLICE, 1940b, p. 104, figs.

Records from West Africa. - Ivory Coast (PAULIAN DE FÉLICE, 1940a).

Distribution. - Known only from the type locality.

(1) It is even probable that the specimens from Togo are different from those from Kribi.

5. « *Philoscia* » *nebulosa* Paulian de Félice, 1940.

Philoscia nebulosa PAULIAN DE FÉLICE, 1940a, p. 106, figs.

Records from West Africa. - Ivory Coast: Port Bouet (PAULIAN DE FÉLICE, 1940a).

Distribution. - Known only from the type locality.

6. « *Philoscia* » *sassandrai* Paulian de Félice, 1940.

Philoscia Sassandrai PAULIAN DE FÉLICE, 1940b, p. 108, figs.

Records from West Africa. - Ivory Coast: Sassandra (PAULIAN DE FÉLICE, 1940a).

Distribution. - Known only from the type locality.

IX. FAMILY PLATYARTHRIDAE Vandel, 1946

Antenna with 2-jointed flagellum; pleopod exopodites without pseudotracheae (some species of *Niambia* have respiratory areas); dorsal parts covered with conspicuous scales; body-size (with the exception of *Niambia squamata*) not exceeding 6 mm. This family which has a world-wide distribution, consists of the genera *Platyarthrus* (Europe, Mediterranean region), *Trichorhina* (world-wide with the exception of Asia, cf. VANDEL, 1953) and *Niambia* (Africa south of the Sahara). Possibly other, not well defined, genera (i.g. *Gerufa* Budde Lund) also belong to this family. As defined in this paper representatives of the genera *Niambia* and *Trichorhina* are found in West Africa. Moreover a new genus, *Lanceochaetus*, is described.

A. Genus LANCEOCHAETUS n. gen.

Type-species: *Lanceochaetus camerunicus* n. sp.

Diagnosis. - All the family characters; no visible frontal line; genus characterized by the peculiar structure of the tergal scale spines which consist of a caudal seta in the shape of a spear-head covered frontally by two tent-like lamellae (Figs 131-134); tergal cuticle without any circular or scaly « cellular » substructure. For comparison we have included SEM-photographs of two other genera of Platyarthridae. In *Platyarthrus* (Figs 135, 136: *P. hoffmannseggi* Brandt, 1833) the scale-spines are bulky structures. The sheath (situated on the caudal side of seta!) shows a

« cellular » substructure and is (at least in the large scale-spines on caudal margins of tergites) solidly connected to tergite cuticle. Between the scale-spines the cuticle has a substructure of circular cells. In *Trichorhina* [Figs 137, 138: *T. tomentosa* (Budde-Lund, 1893)] and in *Niambia* the scale-spines have a leaf-like « sheath » connected by a narrow neck to the tergite cuticle. The substructure of the tergal cuticle consists of scale like semicircular « cells ». For further photographs and functional implications see SCHMALFUSS (1977a).

1. *Lanceochaetus camerunicus* n.sp.

Specimens examined. - Cameroon: 20 km W Victoria, 3 ♂♂, 2.5-2.7 mm long, 1 ♀, 3 mm long, (n. 164-166 M.F.), leg. E. Kohler, 10.III.1973.

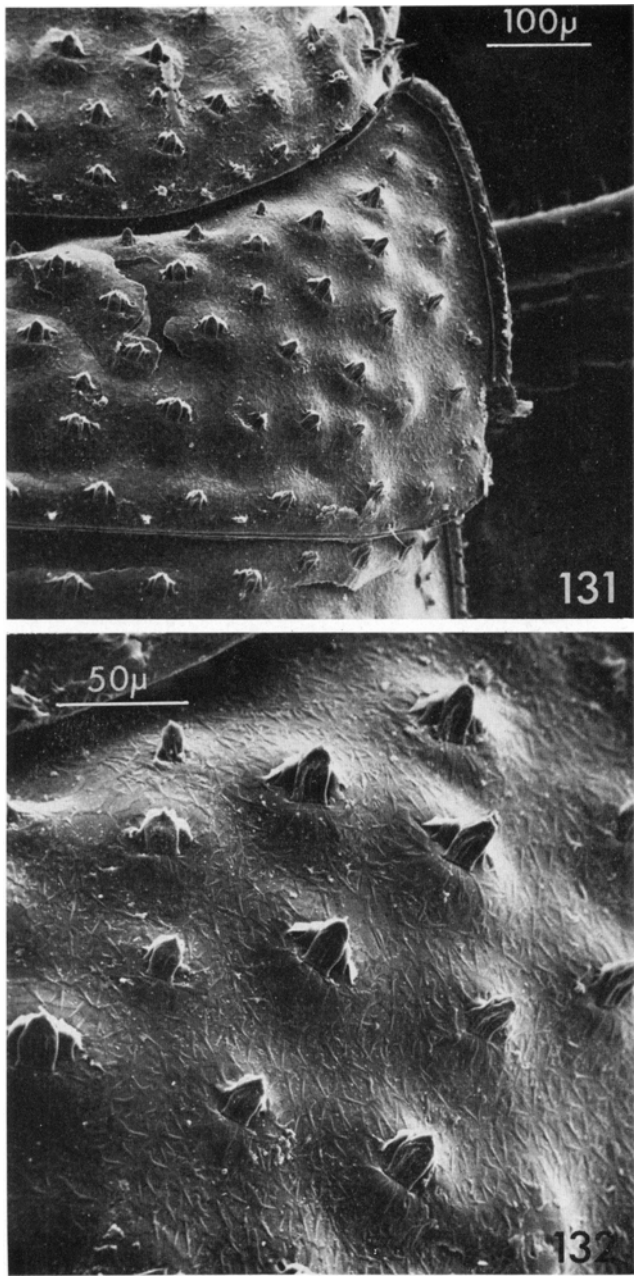
Description. - Holotype: ♂, 2.7 mm long (n. 164 M.F.).

Colourless except for black eyes; dorsal part with peculiar scale-spines as diagnosed in the genus (Figs 131-134); spines with a frontal inclination; peraeon 1 tergite with 4 rows of scale-spines, other peraeon-tergites with 3 rows, pleon-tergites with 2 rows; cephalon with pronounced lateral lobes and well developed triangular medial lobe (Fig. 139); no frontal line visible; eyes with 4 pigmented ommatides; peraeon epimera of tergite 1 not concave caudally (Fig. 139); pleon with well-developed epimera and no interruption between outline of peraeon and pleon; telson (Fig. 140) very short with slightly concave sides and pointed apex; antenna (Fig. 141) with distal joint of flagellum about 3 times the length of proximal one; peraeopod 1 carpus frontally with field of setae (Fig. 142 shows caudal side) functioning as cleaning device for antenna; ventrally with a few strong spines; peraeopod 7 not specialized (Fig. 143); pleopod exopodite 1 (Fig. 144) wider than long, without pronounced medial lobe; endopodite 1 (Fig. 145) with an obliquely truncated apex; exopodite 2 see Fig. 146; uropod (Fig. 140) protopodite reaching as far as tip of telson; exopodite conical.

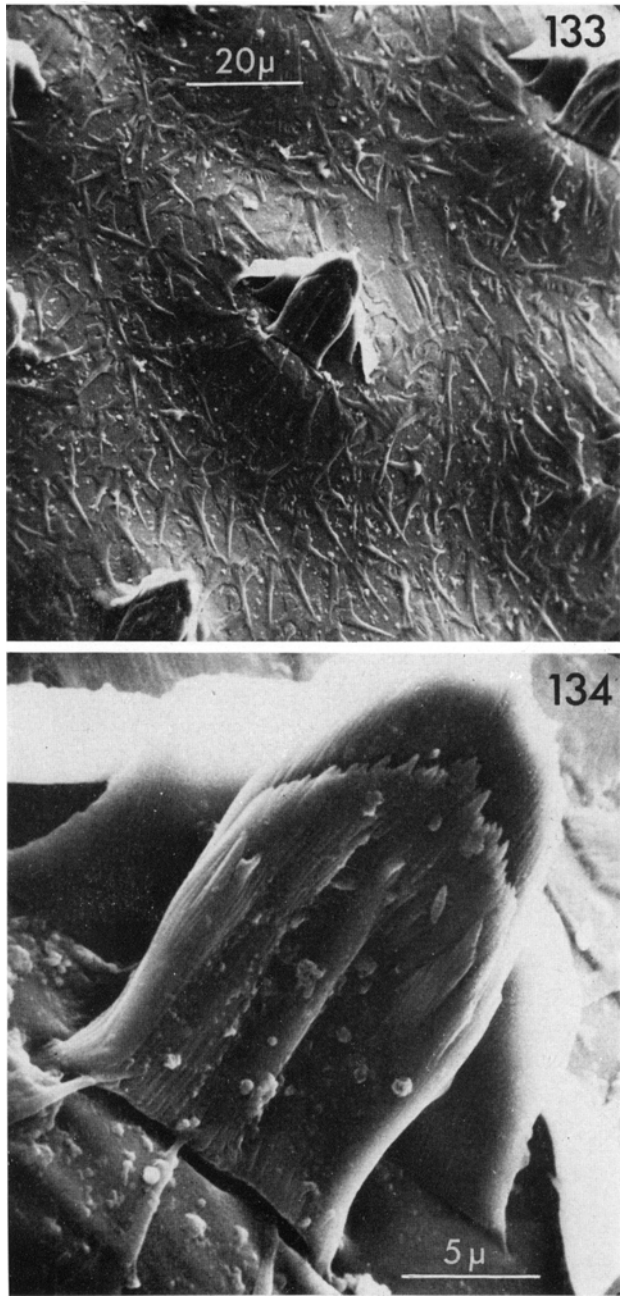
Allotype: ♀, without marsupium, 3 mm long (n. 165 M.F.): pleopods of ♂ and ♀ differ in shape.

Paratypes: 2 ♂♂, 2.5 mm long (n. 166 M.F.).

Remarks. - The peculiar scale-spines on the tergal parts show a *frontal* inclination. This suggests that the behaviour and microhabitat of the species is different from that of other species of Platyarthridae, even if the function of the scale-spines is not yet understood. In a « normal » isopod-microhabitat, this frontal inclination would have a barbing effect which would greatly hinder the animal in moving about in its substrate.



Figs 131, 132. — *Lanceochaetus camerunicus* n. sp.: parts of head and peraeon tergite 1 scale-spines (Fig. 131), scale-spines (Fig. 132); SEM-photographs.



Figs 133, 134. — *Lanceochaetus camerunicus* n. sp.: scale-spines; SEM-photographs.

B. Genus NIAMBIA Budde-Lund, 1909

Type-species: *Leptotrichus squamatus* Budde-Lund, 1885.

Diagnosis. - All the characters of the family; tergal parts equipped with leaf-like scales (compare Figs 137, 138); frontal line present.

In his original diagnosis, BUDDE-LUND (1909, p. 59) claimed that the genus possessed tracheal systems in all the pleopod exopodites (« *caudae pleopodum exopodita omnium parium tracheis incompletis instructa* »). VANDEL (1959a, p. 103) later proved that tracheal systems are missing in *Niambia*. The distinction of *Niambia* from *Trichorhina* is delicate. According to VANDEL (1959b, p. 516) the only difference is the presence of a frontal line in *Niambia* (1).

Distribution. - Africa south of the Sahara, particularly South Africa where numerous species have been described.

1. *Niambia brevicauda* n.sp.

Specimen examined. - « Mile 45 Ada Road », 1 ♀ with marsupium 3.3 mm long (holotype), (B.M. No. 7), leg. W. Belfield, 16.XI.1955.

Description. - The specimen agrees with *N. eburnea* except for its extremely short telson (Fig. 147), about 5 times as wide as long and with strongly concave sides and rounded apex; eyes with 5 ommatides.

2. *Niambia* cf. *eburnea* (Vandel, 1953).

Trichorrhina (sic) sp. PAULIAN DE FÉLICE, 1940b, p. 109.
Trichorhina eburnea VANDEL, 1953, p. 374, figs.
Niambia eburnea VANDEL, 1959b, p. 516.

Records from West Africa. - Ivory Coast: Sassandra (PAULIAN DE FÉLICE, 1940b; VANDEL, 1953).

Distribution. - Known only from the type locality.

Specimens examined. - Ivory Coast: near Satikran (rain forest), 2 ♀ ♀ with marsupium 3 mm long, (n. 167 M.F.), leg. E. Kohler, 15.IV.1971.

Remarks. - Our ♀ ♀ agree well with VANDEL's description especially in the form of scale-spines. However, as no males were studied, we are tentatively ascribing our specimens to *N. eburnea.*

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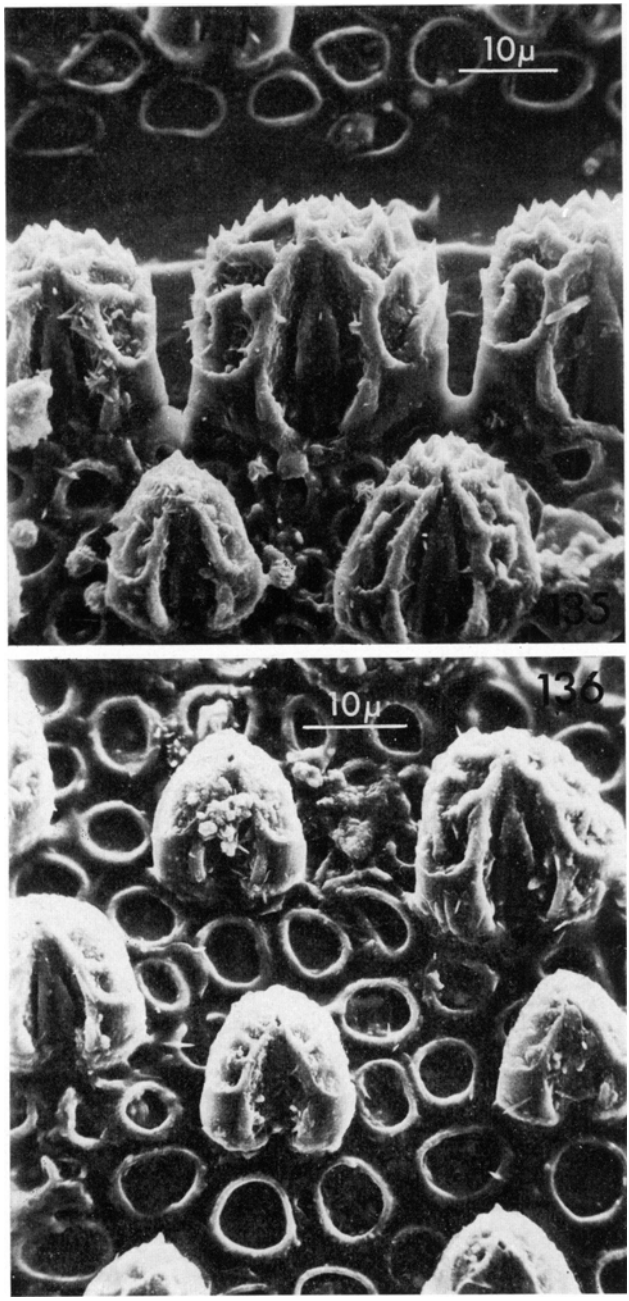
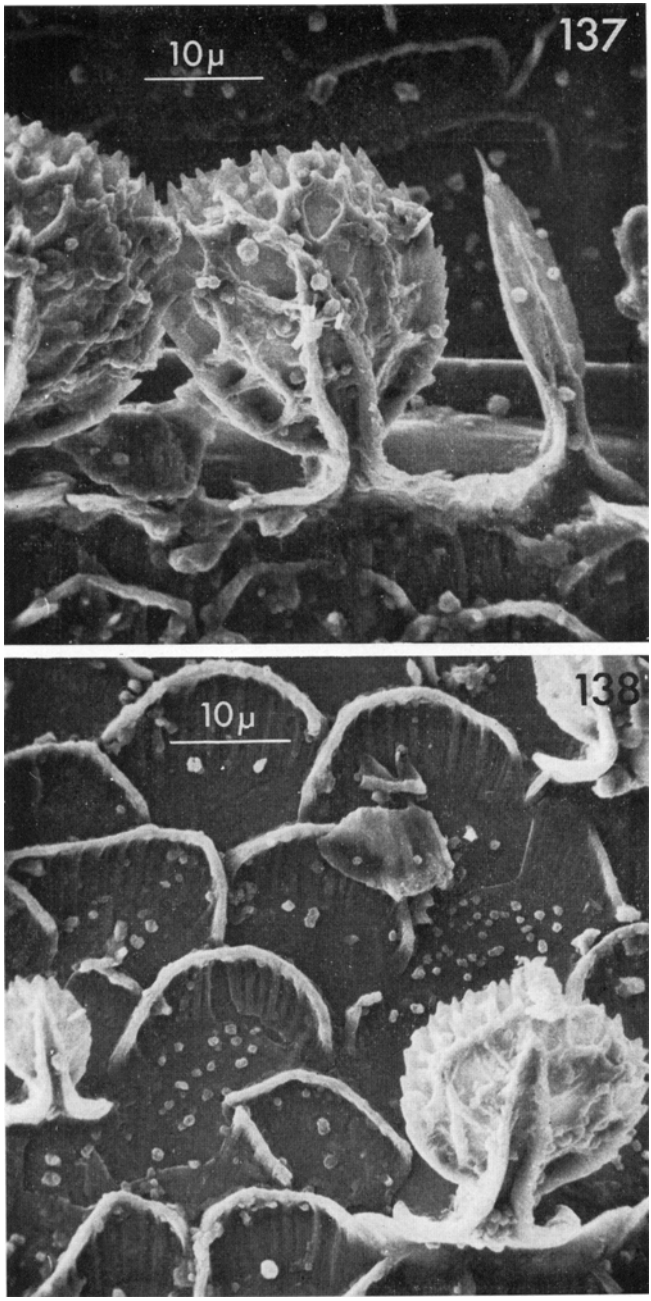
(1) Because of the presence of a frontal line (very difficult to see) we ascribe the following species to *Niambia* but one must remember that both *N. truncata* (Brandt, 1833) and *N. squamata* (Budde-Lund, 1885) (see p. 77) and — if one considers BARNARD's fig. 23 (1932) — other species, have respiratory areas in the pleopod exopodites. A re-examination of the South African species is necessary in order to clarify whether the presence-absence of such structures is a key in separating *Niambia* and *Trichorhina.*



Figs 135, 136. — *Platyarthrus hoffmanseggi* Brandt (from Tübingen, Germany). scale-spines at caudal margin of peraeon-tergite (Fig. 135), scale-spines and circular cuticle-structures in centre of peraeon tergite (Fig. 136); SEM-photographs.



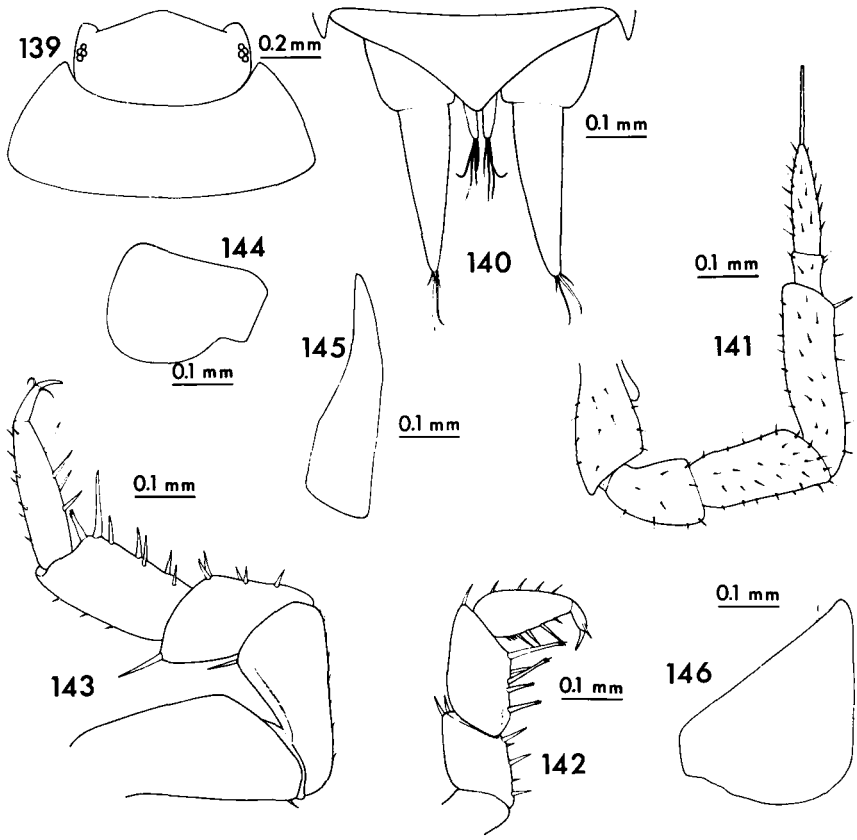
Figs 137, 138. — *Tricorhina tomentosa* (Budde-Lund) (from greenhouse in Tübingen, Germany): scale-spines at caudal margin of peraeon-tergite (Fig. 137), scale-spines and scale-like cuticle-structures in centre of peraeon tergite (Fig. 138); SEM-photographs.

3. *Niambia palmetensis* Vandel, 1959.

Niambia palmetensis VANDEL, 1959b, p. 516, figs.

Records from West Africa. - Ghana: Keta.

Distribution. - Known only from the type-locality.



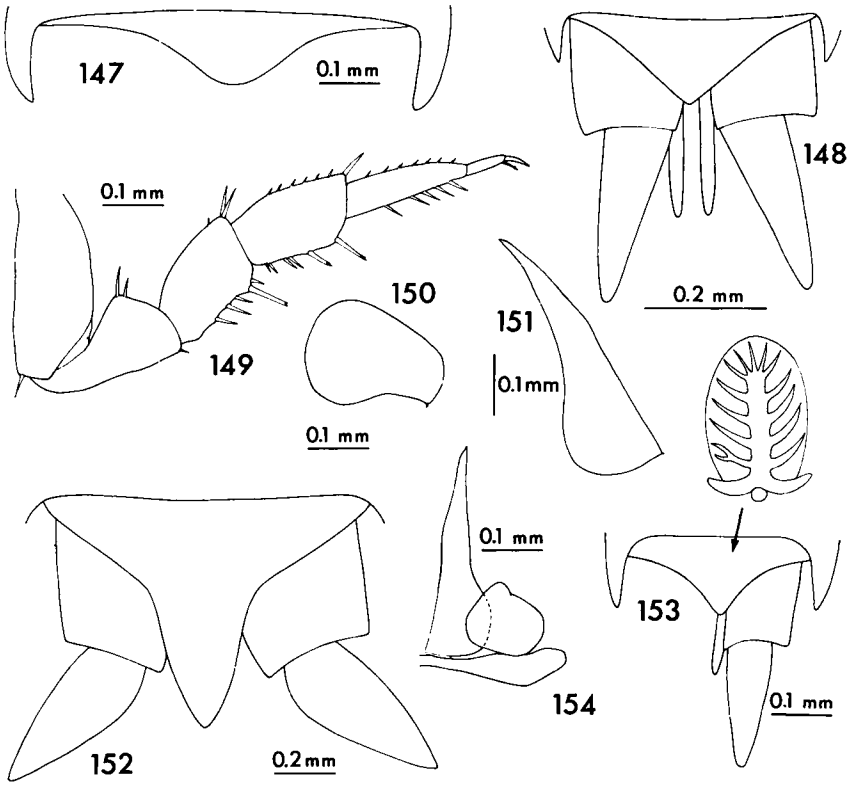
Figs 139-146. — *Lanceochaetus camerunicus* n. sp. ♂: cephalon and first peraeon segment (Fig. 139), telson and uropods (Fig. 140), antenna (Fig. 141), peraeopod 1 (Fig. 142), peraeopod 7 (Fig. 143), pleopod 1 exopodite (Fig. 144), pleopod 1 endopodite (Fig. 145), pleopod 2 exopodite (Fig. 146).

4. *Niambia senegalensis* n.sp.

Specimens examined. - Senegal: Thiès, 1 ♂, about 3 mm long, 1 ♀ with marsupium about 3 mm long, (M.T.), leg. F. Silvestri, 1912.

Description. - Holotype: ♂, about 3 mm long.

Completely colourless; tergal parts granulate densely covered with usual *Niambia*-type scale-spines; frontal line very thin clearly visible only in the middle; eyes with 6 ommatides; telson (see allotype, Fig. 148) short, about 3 times as wide as long; antenna missing in both type-specimens; peraeopod 1 missing; peraeopod 7 (Fig. 149) not specialized;



Figs 147-154. — *Niambia brevicauda* n. sp. ♀: telson (Fig. 147). *Niambia senegalensis* n. sp.; ♀: telson and uropods (Fig. 148); ♂: peraeopod 7 (Fig. 149), pleopod 1 exopodite (Fig. 150), pleopod 1 endopodite (Fig. 151). *Niambia squamata* (Budde-Lund) ♀: telson and uropods (Fig. 152). *Trichorhina minima* n. sp. ♂: telson and right uropod (Fig. 153), pleopod 1 (Fig. 154).

pleopod exopodite 1 (Fig. 150) with completely rounded median part; endopodite 1 (Fig. 151) with acutely pointed apex; uropod exopodite (see allotype, Fig. 148) short and conical.

Allotype ♀ with eggs in marsupium, about 3 mm long; head, peraeopods and pleopods missing, deformed; telson and uropods, see Fig. 148.

Remarks. - The species closely resembles *Niambia eburnea* from the Ivory Coast, differing only in the completely rounded first male pleopod exopodite which has a distinct median lobe in *N. eburnea* (see VANDEL, 1953, p. 380).

The specimens were labelled « *Trichorhina granulata* Arc., Is.-177 »; however, no description exists.

5. *Niambia squamata* (Budde-Lund, 1885).

Leptotrichus squamatus BUDDE-LUND 1885, p. 196; DOLLFUS, 1899, p. 156.
? Leptotrichus squamatus DOLLFUS, 1898, p. 125.
Niambia squamata BUDDE-LUND, 1909, p. 60, figs; STEBBING, 1910, p. 441; VAN NAME, 1920, p. 102, figs; BARNARD, 1932, p. 259, fig.; PAULIAN DE FÉLICE, 1940a, p. 109; ARCANGELI, 1950a, p. 56; BRIAN, 1953, p. 11, figs.

Records from West Africa. - ? Senegal: Dakar (DOLLFUS, 1898).
Ivory Coast: Sassandra (PAULIAN DE FÉLICE, 1940a).
Nigeria: Benin (BARNARD, 1932).
Cabinda (ex-Portuguese Congo): Landana; Chinchoxo (BUDDE-LUND, 1885).
Zaire: Kongolo opposite Matadi (ARCANGELI, 1950a); Zambi (6°S-12°50'E) (VAN NAME, 1920).

Distribution. - Known also from Angola (BRIAN, 1953). The doubtful record from South Africa (PANNING, 1924) is supposedly a mis-identification (cf. BARNARD, 1932, p. 260).

Specimen examined. - Zaire: Boma, 1 ♀ without marsupium, 6 mm long, (M.T.), leg. F. Silvestri, 1913.

Remarks. - The telson of our specimen (Fig. 152) agrees with the drawing given by BUDDE-LUND (1909, pl. VI, fig. 3). Graphic inaccuracies probably account for the difference between this and the figures given by VAN NAME (1920) and BRIAN (1953). All the pleopod exopodites show an *Oniscus*-type respiratory area.

6. *Niambia* sp. I.

Specimen examined. - Togo: Kolekope, 1 ♀ without marsupium, 3 mm long, (M.R.A.C.), leg. F. Puylaert, 26-31.VIII.1969.

Remarks. - The sex of the specimen does not allow for a specific determination. Similar to *N. palmetensis*, the only difference is the uropod exopodite, about twice as long as that figured for *N. palmetensis* by VANDEL (1959b, p. 517).

7. *Niambia* sp. II.

Specimen examined. - Guinea: Conacry, 1 ♀ with marsupium 4 mm long, (M.T.), leg. F. Silvestri, 1912.

Remarks. - The sex of the specimen does not allow for a specific determination. Very similar to *N. palmetensis* in the shape of scale-spines, telson and other female characters, it is completely colourless and eyes have more than 10 ommatides.

C. Genus TRICHORHINA Budde-Lund, 1908

Type-species: *Bathytropa thermophila* Dollfus, 1896 (=*Alloniscus tomentosus* Budde Lund, 1893).

Diagnosis. - Small animals, not exceeding 6 mm; most of the species white or greyish because of the more or less reduced pigment; back without granulations but covered with large scale-spines supported by a very evident « skeleton »; frontal line absent (1); supra-antennal line present; small eyes with less than 10 ommatides, often reduced or absent; pleon normally not interrupted from peraeon; telson triangular [rounded in *simoni* (Dollfus, 1893) and *caeca* Vandel, 1952]; antenna short, flagellum with first joint much shorter than the second.

Remarks. - As said before (p. 72), the distinction between *Trichorhina* and *Niambia* is delicate and at the moment not satisfactory. About 30 species are ascribed to this genus (VANDEL, 1962). They range over tropical America, Africa, Madagascar and surrounding islands, central Asia, Australia, New Caledonia. Three species are found in Europe (Spain and southern France).

1. *Trichorhina hospes* Silvestri, 1918.

Trichorina (sic) *hospes* SILVESTRI, 1918, p. 292, figs.

Records from West Africa. - Nigeria: Olokemeji.

Distribution. - Known only from the type-locality.

Remarks. - As the description of this species does not mention a frontal line, the species could belong to the genus *Niambia.*

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(1) According to BUDDE-LUND (1913) and VANDEL (1959a) a frontal line is present in three species of *Trichorhina* (*minutissima* Budde-Lund, 1913; *micros* Budde-Lund, 1913; *atlasi* Vandel, 1959).

2. *Trichorhina minima* n.sp.

Specimen examined. - Togo: Alokoegbe, 1 ♂, 2 mm long, (M.R.A.C.), leg. M. Delchambre, VI.1974.

Description. - « Normal » pigmentation, scale-spines as in Fig. 153; cephalon with a strong bulbosity in the profrons; eyes with 4 ommatides; telson and first male pleopod shown in Figs 153, 154; small size suggests that this is a juvenile, making a distinctive description impossible.

3. *Trichorhina* sp.

Specimen examined. - Cameroon: Yaoundé, 1 ♀, (n. 168 M.F.), leg. V. Haas, 24.XI.1974.

Remarks. - Because of the sex and poor condition no specific determination can be given.

X. Family TRACHELIPIDAE Srouhal, 1953

Pleopod exopodites 1-3, 1-5 with pseudotracheae; antennae with 2 or 3 (*Phalaba* Budde-Lund) jointed flagellum; conglobation exoantennal in *Porcellium*, other genera unable to conglobate. The family consists of the genera *Trachelipus, Nagurus* (including *Nagaroides* which we do not, for the time being, consider a distinct genus), *Protracheoniscus*, *Fossoniscus*, *Pagana*, *Phalaba*, *Porcellium*, *Agnara*, *Orthometopon*, *Hemilepistus*, *Desertellio*, *Tropicocellio*, *Desertoniscus*, *Tadzhikoniscus*. It is distributed throughout Europe, Africa including Madagascar, Asia and the Indo-Australian region. Two species of *Nagurus* have been introduced into America.

A. Genus Nagurus Holthuis, 1949 (= Nagara Budde-Lund, 1908)

Type-species: *Porcello cristatus* Dollfus, 1889.

Diagnosis. - Pleopod exopodites 1-5 equipped with pseudotracheae; antenna with 2-jointed flagellum; head *Porcellio*-like, with prominent median and lateral lobes; epimera of peraeon segment 1 caudally concave; telson as long as wide, sides distinctly concave, apex narrowly rounded; tergites tuberculated.

At the moment we have not treated *Nagaroides* Wahrberg, 1922 as a distinct genus. Including the species ascribed to *Nagaroides*, the genus *Nagurus* comprises about 27 described species (see Arcangeli, 1963; for

descriptions of two additional species see SCHMOELZER, 1974 and SCHMALFUS, 1977b). Due to man the species *N. cristatus* and *N. nanus* Budde-Lund, 1908 are widely spread in the tropical zones while the autochtone species are found in Italy (Sardinia), throughout the eastern Mediterranean, Asia and the Indo-Australian region and *N. onisciformis* Schmoelzer, 1974 in northern Africa (Chad).

1. *Nagurus cristatus* (Dollfus, 1889).

Nagara cristata BUDDE-LUND, 1908, p. 284, figs; PAULIAN DE FÉLICE, 1943a, p. 110.
Nagarus cristatus ARCANGELI, 1963 p. 10.

Records from West Africa. - Cameroon: without locality (BUDDE-LUND, 1908); Edea (PAULIAN DE FÉLICE, 1940a).

Distribution. - Widely spread throughout the tropical regions. In Africa known also from Eala in Zaire (ARCANGELI, 1950a). The wide distribution is probably due to man. It is not known whether it is autochtone or introduced in Africa.

B. Genus PROTRACHEONISCUS Verhoeff, 1917

Type-species: *Porcello amoenus* C. L. Koch, 1841.

Diagnosis. - Pleopod exopodites 1 5 with *Porcellio*-type pseudotracheae; antenna with 2-jointed flagellum; head *Porcellionides*-like, no pronounced median and lateral lobes; peraeon segment 1 with caudal margin of epimera convex; telson always wider than long, apex pointed; unable to conglobate; tergites without tubercules.

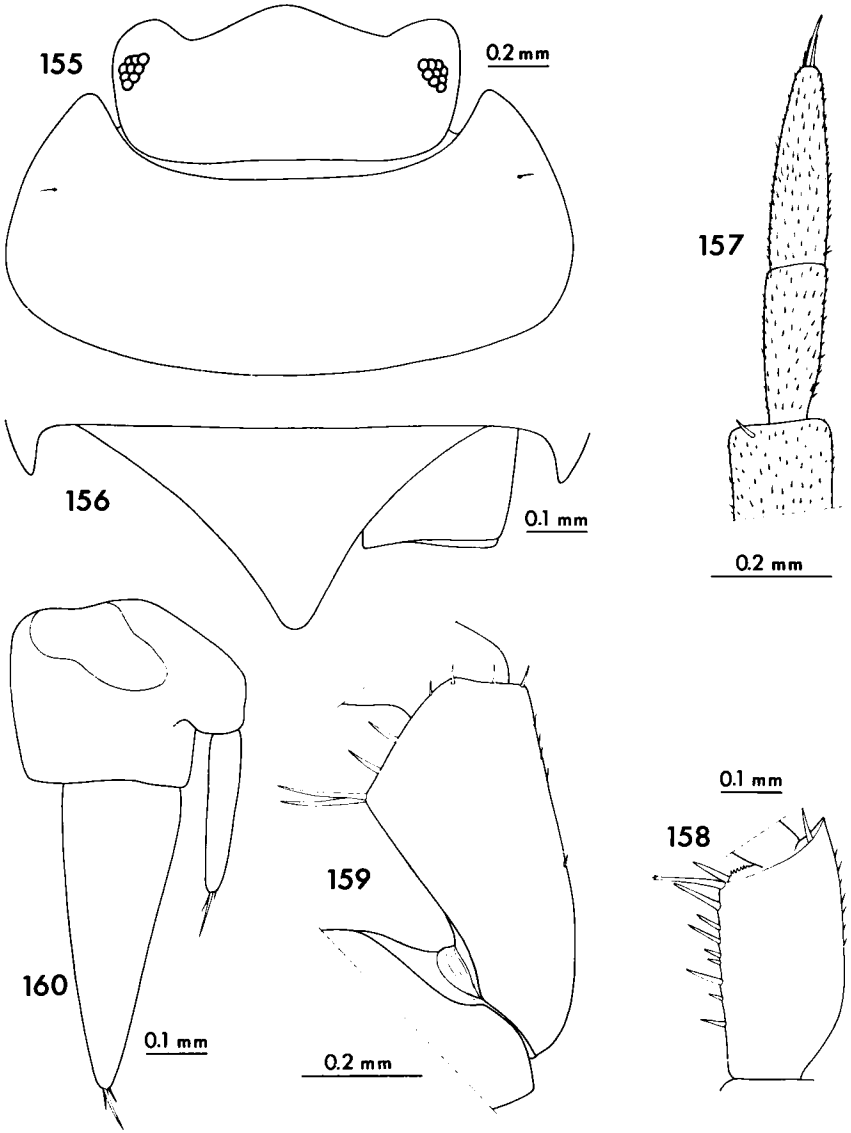
The genus consists of about 60 described species (the number of 80 given by BORUTZKY, 1975 seems incorrect), distributed from western Europe to eastern Asia with the highest density in western and central Asia. The species *P. pierrei* Vandel, 1950 described from North Africa, has been transferred to another genus (VANDEL, 1958). So far *P. inexpectatus* n.sp., described in the present paper, would be the first record of the genus from Africa. However, we suspect that *Fossoniscus nubicus* Strouhal, 1965 from northeast Africa may also belong to this genus.

1. *Protracheoniscus inexpectatus* n.sp.

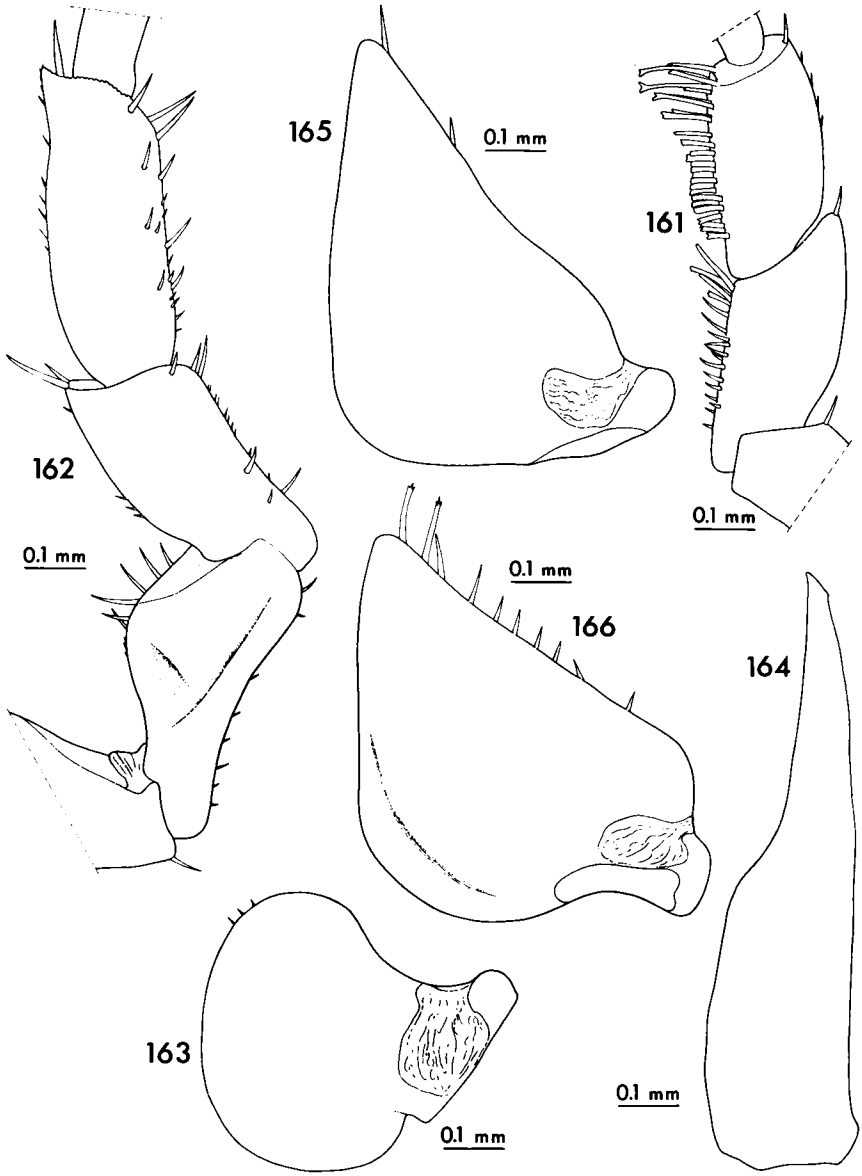
Specimens examined. - Guinea Bissau: Bolama, 3 ♂♂, 4.4-4.7 mm long, 24 ♀♀ with marsupium 4.5-6 mm long, 1 ♀ without marsupium 4.5 mm long, (M.G.), leg. L. Fea, VI-XII.1899.

Description. - Holotype ♂, 4.7 mm long.

Faded (as in all other specimens) by long conservation; tergites without tubercules, densely covered with small scale-spines; cephalon (Fig. 155) with triangular medial lobe reaching as far forwards as lateral

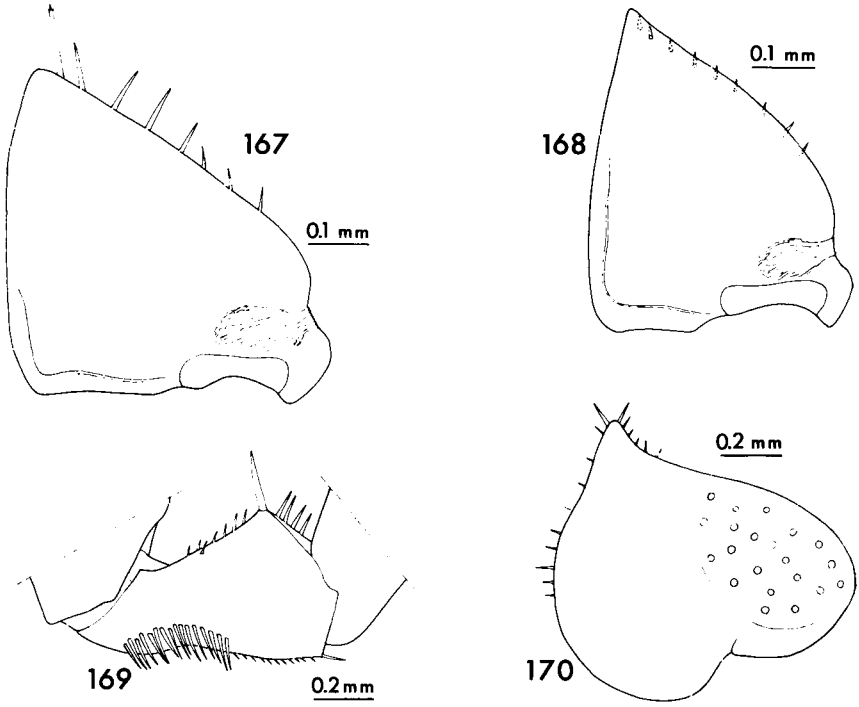


Figs 155-160. — *Protracheoniscus inexpectatus* n. sp.; ♂: cephalon and peraeon segment 1 (Fig. 155), telson (Fig. 156), antennal flagellum (Fig. 157); ♀: peraeopod 1 carpus (Fig. 158), peraeopod 7 ischium (Fig. 159), uropod (Fig. 160).



Figs 161-166. — *Protracheoniscus inexpectatus* n. sp. ♂: peraeopod 1 carpus and merus (Fig. 161), peraeopod 7 (Fig. 162), pleopod 1 exopodite (Fig. 163), pleopod 1 endopodite (Fig. 164), pleopod 2 exopodite (Fig. 165), pleopod 3 exopodite (Fig. 166).

lobes; eyes with 10 ommatides; peraeon with caudal margin of epimera 1 completely rounded; tergites with *noduli laterales* at about the same distance from lateral margin of epimera; telson (Fig. 156) wider than long, sides very slightly concave, apex narrowly rounded; antenna with proximal joint of flagellum slightly shorter than the distal one (Fig. 157); peraeopod 1 carpus (Fig. 161) and — to a lesser extent — peraeopod 2-3 carpus,



Figs 167-170. — *Protracheoniscus inexpectatus* n. sp. ♂: pleopod 4 exopodite (Fig. 167), pleopod 5 exopodite (Fig. 168). *Leptotrichus atracheatus* n. sp. ♂: peraeopod 7 ischium (Fig. 169), pleopod 1 exopodite (Fig. 170).

ventrally with brush of partly cleft spines; peraeopod 7 (Fig. 162) with ischiopodite ventrally concave, caudal side with a groove; carpus slightly enlarged dorsally; pleopod exopodites 1-5 (Figs 163, 165-168) with well-developed pseudotracheae with a slit- or tube-like opening; exopodite 1 slightly wider than long, with a very broadly rounded median lobe; endopodite 1 see Fig. 164; exopodites 2-5 equipped with distal rows of very strong spines directed ventrally; uropods missing; uropod of a paratype ♀, see Fig. 160; a conspicuous character is the short conical exopodite.

Allotype ♀ with marsupium 5 mm long.

Peraepods and pleopods of the ♂ and ♀ differ in shape; peraeopods 1-3, ♀, lacking brush on the carpus but with a row of strong spines (see Fig. 158: paratype ♀); peraeopod 7 ischiopodite not concave ventrally (paratype ♀ see Fig. 159) and carpus not enlarged dorsally.

Paratypes: 2 ♂♂, 24 ♀♀.

Remarks. - The great distance between this locality and the known distribution of the genus supports the suspicion that the species may have been introduced into West Africa, or that the locality may be erroneously labelled. On the other hand, the presence of tracheal systems resembling those in *Fossoniscus nubicus* from northeast Africa and differing from those in some known species of *Protracheoniscus*, may mean that the species belongs to a different genus. These questions can be solved only by further research.

XI. Family PORCELLIONIDAE Verhoeff, 1918

Pleopod exopodites 1-2 with pseudotracheae, exceptionally reduced; antenna with 2-jointed flagellum; unable to conglobate; uropod-exopodites always protruding backwards, surpassing outline of pleon.

The family contains the genera *Porcellio* (including *Haloporcellio*), *Lucasius, Porcellionides, Soteriscus, Caeroplastes, Acaeroplastes, Proporcellio, Agabiformius, Leptotrichus, Atlantotrichus, Tura, Uramba, Thermocellio, Pondo* and *Congocellio* (the systematic position of *Xeroporcellio* is doubtful as this was described on one perhaps juvenile male). The family is distributed throughout Europe, Asia and Africa and a number of species have been introduced into America and Australia. The genera *Porcellio, Tura, Uramba, Thermocellio, Congocellio, Pondo* and *Porcellionides* (with an introduced species) occur south of the Sahara in Africa. As defined here *Porcellio, Porcellionides, Uramba* and *Tura* inhabit West Africa.

Remarks. - The family Porcellionidae is founded on the presence of a tracheal system in the pleopod exopodites 1-2 and an incapacity to conglobate. Its phylogenetic position is still somewhat in doubt. In fact, forms without tracheal systems such as the Platyarthridae may belong phylogenetically to the Porcellionidae (or the Trachelipidae), having reduced the tracheal systems because of small size. As well, the families Armadillidiidae and Periscyphisidae (each having two pairs of pseudotracheae) may also belong phylogenetically to Porcellionidae. If true, both these hypotheses would mean that the traditional Porcellionidae are not a monophyletic unit.

If the presence of two pairs of pseudotracheae is a derived character

(still debatable), it could have evolved several times independently. Thus it could be argued (taking into account a combination of other morphological characters) that there is one phyletic unit consisting of *Porcellionides* (2 pairs) and allied genera, *Orthometopon* (3 pairs), and *Protracheoniscus* (5 pairs), and another one containing *Porcellio* (2 pairs), *Trachelipus* (5 pairs), *Nagurus* (5 pairs), etc. These questions can be solved only by extensive morphological and anatomical studies. For the time being no decision is possible and thus, despite the fact that these may be artificial, we have maintained the traditional definition of the families Porcellionidae and Trachelipidae.

A. Genus LEPTOTRICHUS Budde Lund, 1885

Type-species: *Porcellio Panzeri* Audouin, 1826.

Diagnosis. Very convex body normally covered with sparse setae and bordered by long cilia; cephalon with a triangular, very protruding bulbosity in the middle, lateral lobes small; antenna very short; pleopod exopodites 1-2 with pseudotracheae (excepting in the following species, if the attribution to *Leptotrichus* is correct).

This genus includes about 12 species, all of which inhabit the Mediterranean region except for one found in the Canary islands.

1. *Leptotrichus atracheatus* n.sp.

Specimens examined. - ? Sao Thome: Zampalma (the tube also contains a label: « Luanda, Angola, Aug. 1949, L. F. Galbraith »), 1 ♂ 7 mm long, 2 ♀♀ with marsupium, 7-8 mm long, 2 ♀♀ without marsupium, 5.5-7 mm long, (B.M. No. 136), collector ?, date ?

Description. - Very similar to *L. panzeri* (Audouin, 1826). Peraeon epimera steep; head bulbous; antennae very short, not reaching caudal margin of peraeon tergite 1; tergal parts densely covered with hair-like setae; pleopod exopodites 1-2 without pseudotracheae but with respiratory areas; pleopod exopodite 1, ♂, (Fig. 170) with very short medial lobe instead of the long medial laterally pointing lobe known in all other species of *Leptotrichus*; ischiopodite 7 with a very peculiar comb of long ventrally pointing spines (Fig. 169) missing in the ♀ and all other species of *Leptotrichus*.

Inspite of the absence of pseudotracheae, we consider this species as a member of the genus *Leptotrichus* as it agrees completely in all other generic characters with the other species of this genus. This implies that the absence of pseudotracheae must be due to reduction. The locality is

doubtful since the tube contains a label for Sao Thome and one for Luanda, Angola. Both localities are completely out of the recorded range of the genus *Leptotrichus*, restricted to the Mediterranean region.

The fact that the specimens were found in the same tube with a specimen of *Rhyscotus globiceps*, a strictly tropical species, indicates that the *Leptotrichus* specimens really were collected either at Sao Thome or in Angola. However, there is also the possibility that specimens from the same tube were mixed up and mis-labelled, so the origin of *Leptotrichus atracheatus* remains doubtful.

B. Genus PORCELLIO Latreille, 1804

Type-species: *Porcellio scaber* Latreille, 1804.

Diagnosis. - Two pairs of pseudotracheae; unable to conglobate; peraeon tergite 1 normally with caudally concave epimera; eyes with more than 20 ommatides (a dubious character used to separate *Porcellio* from *Lucasius*).

The genus comprises more than 150 described species (cf. GRUNER, 1966, p. 255). The autochtone species occur in Europe, the northern half of Africa and estern Asia, while the introduced species are found all over the world.

1. *Porcellio laevis* Latreille, 1804.

Porcellio laevis DOLLFUS, 1897, p. 208; DOLLFUS, 1898, p. 256; DOLLFUS, 1899, p. 125; PAULIAN DE FÉLICE, 1940a, p. 109.

Records from West Africa. - Senegal: Dakar (DOLLFUS, 1898; PAULIAN DE FÉLICE, 1940a).

Distribution. - Synanthropic, it has gained world-wide distribution due to man.

2. *Porcellio monardi* Brian, 1953.

Porcellio Monardi BRIAN, 1953, p. 14, figs.

Records from West Africa. - Guinea Bissau: « Isola di Bissau »; Contubo El (BRIAN, 1953).

Distribution. - Known only from Guinea Bissau.

Specimens examined. - Guinea Bissau: Bolama, 2 ♂♂, 5.5-7.3 mm long, 1 ♀ without marsupium, 7 mm long, 1 ♀ with marsupium, 6 mm long, (M.G.), leg. L. Fea, VI-XII.1899; Cassine (= Cacine), 1 ♂, 5.5 mm long, 4 ♀♀ without marsupium, 4.5-6.5 mm long, (M.G.), leg. L. Fea, VI-XII.1899.

Description. Specimens faded by long conservation; head and peraeon tergites with strong tubercules; cephalon (Fig. 171) with pronounced median and lateral lobes, very similar to those of *Porcellio scaber*, triangular median lobe slightly surpassing lateral lobes; eyes with 25-30 ommatides; peraeon with tergite 1 epimera caudally markedly concave (Fig. 171); telson wider than long, concave sides with apex pointed (Fig. 172); antenna (Fig. 173) stout, with furrows and teeth on peduncle joints; flagellum joints about the same length; peraeopod 1, ♂, merus and carpus with a brush of terminally enlarged cleft spines (Fig. 175), only a few normal spines in the ♀; peraeopod 7, ♂, ischium ventrally concave (Fig. 176), in ♀ ventrally straight; pleopod exopodites 1-2 with pseudotracheae; exopodite 1, ♂, (Fig. 177) with broadly rounded inner lobe and an incision in the tracheal area, also present in the ♀; endopodite 1 straight not specialized terminally; exopodite 2, ♂, see Fig. 178; uropod (Fig. 174) protopodite with distal margin not oblique; exopodite short and stout; endopodite slightly surpassing tip of telson. Peraeopods and pleopods (see above) of the ♂ and ♀ differ in shape.

3. *Porcellio scaber* Latreille, 1804.

Porcellio Nodieri DOLLFUS, 1898, p. 124, figs; DOLLFUS, 1899, p. 256; PAULIAN DE FÉLICE, 1940a, p. 110.
Porcellio scaber VANDEL, 1962, p. 665.
? *Porcellio scaber* HILGENDORF, 1893a, p. 154; HILGENDORF, 1893b, p. 176; PAULIAN DE FÉLICE, 1940a, p. 110.

Records from West Africa. - Senegal: Dakar (DOLLFUS, 1898). ? Togo (HILGENDORF, 1893a).

Distribution. - Originating in western Europe, it has been introduced into many parts of the world.

Remarks. - The synonymy between *P. nodieri* and *P. scaber* was estabilished by VANDEL (1962, p. 665) after examining the type-specimens of *P. nodieri*. However, it is improbable that the HILGENDORF-specimens belong to *P. scaber*. Due to man this species is now widely distributed throughout the temperate zones of the world but has nowhere been successfully introduced into a tropical region. The specimens may belong to *P. monardi* (easily confused with *P. scaber*) or to an undescribed species.

C. Genus PORCELLIONIDES Miers, 1877

Synonym: *Metoponorthus* Budde-Lund, 1879.
Type-species: *Porcellio jelskii* Miers, 1877 = *Porcellionides pruinosus* (Brandt, 1833).

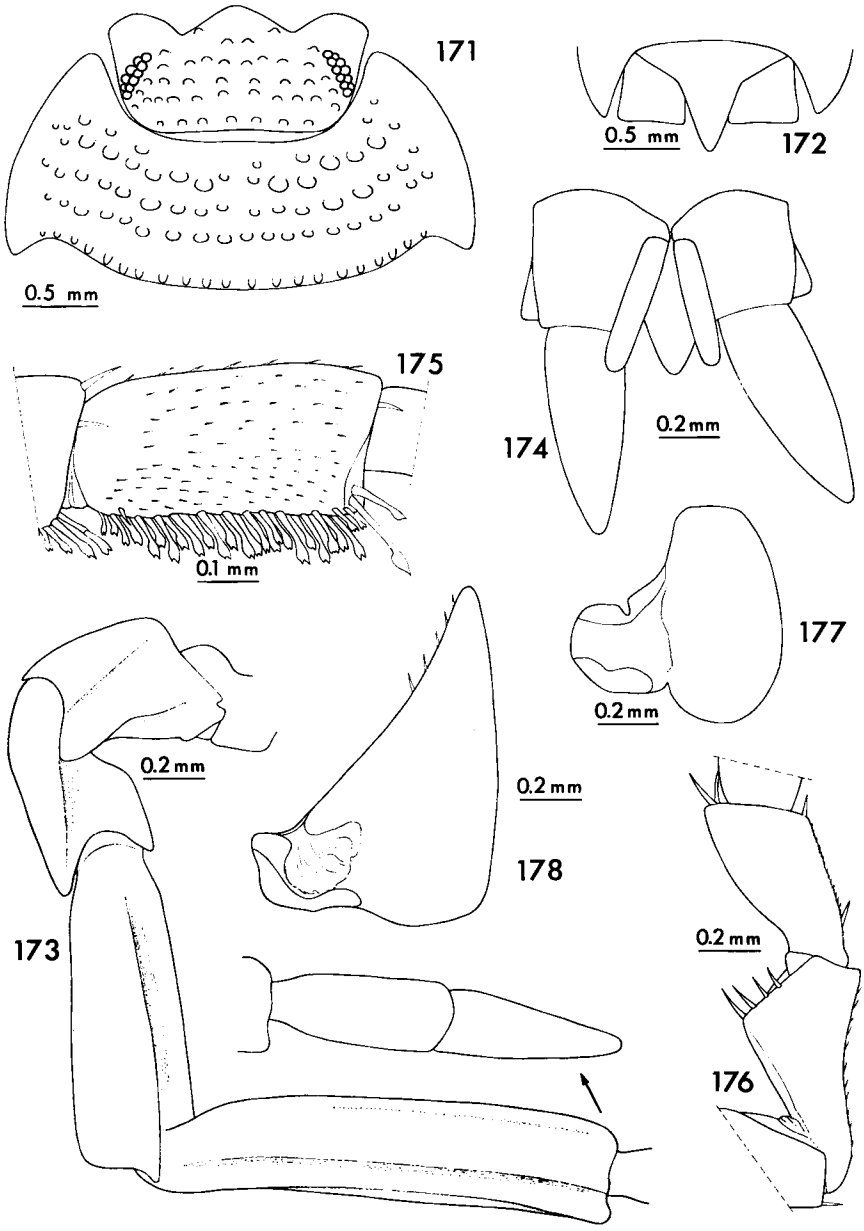
Diagnosis. - Pleopod exopodites 1-2 with *Porcellio*-like tracheal systems; antenna with 2-jointed flagellum; unable to conglobate; head

without distinct lateral and median lobes; frontal line well-developed, supra antennal line pronounced, V-shaped, in most species; peraeon tergites 1-3 with caudally rounded epimera, not concave; telson triangular with concave sides and pointed apex, wider than long; tergites (in all species ?) with characteristic cuticolar growths forming circular plates or rings behind each scale spine and a dense cover of small balls in the area between the scale-spines (Fig. 179).

About 70 species have been described (cf. GRUNER, 1966, p. 250) of which many are undoubtedly synonymous. The genus is distributed throughout Europe, western Asia and northern Africa. Due to man, *P. pruinosus* has become cosmopolitan.

In this review we have tried to settle the tedious question of whether this genus should be called *Porcellionides* or *Metoponorthus*. The senior name *Porcellionides* has been rejected e.g. by VANDEL (1962) with the argument that MIERS (1877, p. 668) subsumed under his subgenus *Porcellionides* species which are now considered to belong to a different genus (*Porcellio aztecus*, see below), and that BUDDE-LUND gave a better description for *Metoponorthus* than MIERS did for *Porcellionides*. However, according to the International Rules of Zoological Nomenclature, these arguments are no reason for rejecting the senior name. Neither is the fact that *Porcellionides* can be easily confused with *Porcellio* nor that a type-species has never been designated to *Porcellionides*. The two names have been alternatively used over the last 50 years, so *Porcellionides* is by no means a *nomen oblitum*.

In the hopes of settling this question, we examined the type-material of the MIERS-species *Porcellio jelskii* and *Porcellio flavovittata*. Both species are currently considered to be synonyms of *Porcellionides pruinosus*, whereas *Porcellio aztecus*, included by MIERS in his subgenus *Porcellionides*, is considered a synonym of *Porcellio laevis*. Three syntypes of *Porcellio jelskii*, a ♂ 8 mm long and two ♀♀ with marsupium 10 mm long labelled « Guiana, Maraynioe », belong without doubt to *Porcellionides pruinosus*. The examination of two syntypes ♀♀ of *Porcellio flavovittata* showed the first, with marsupium 9 mm long to belong to *Porcellionides pruinosus* whereas the second, with marsupium 12 mm long, definitely belongs to a different species of *Porcellionides* or to an allied genus. Its peraeon tergites have different proportions and the characteristic V-shaped supra antennal line is missing. However both the sex and mutilated condition of the specimen make a specific identification impossible. In his description of *P. flavovittata* MIERS writes (p. 669) « Lateral margins of the segments of the body with a marginal yellow band ». This marginal yellow band, orange in living specimens, is characteristic of *Porcellionides pruinosus* e.g. of the eastern Mediterranean.



Figs 171-178. — *Porcellio monardi* Brian ♂: cephalon and peraeon segment 1 (Fig. 171), telson (Fig. 172), antenna (Fig. 173), uropods (ventral) (Fig. 174), peraeopod 1 carpus (Fig. 175), peraeopod 7 (Fig. 176), pleopod 1 exopodite (Fig. 177), pleopod 2 exopodite (Fig. 178).

In the next paragraph MIERS remarks « In one specimen only ... which might, if in better condition, have proved distinct, is the lateral marginal yellow entirely absent ». We consider this, with all probability, to be the specimen referred to above as not belonging to *Porcellionides pruinosus*. In conclusion, it is our opinion that the genus must be named *Porcellionides*, and we designate *Porcellio jelskii* Miers, 1877, being a synonym of *Porcellionides pruinosus*, as type-species of the genus.

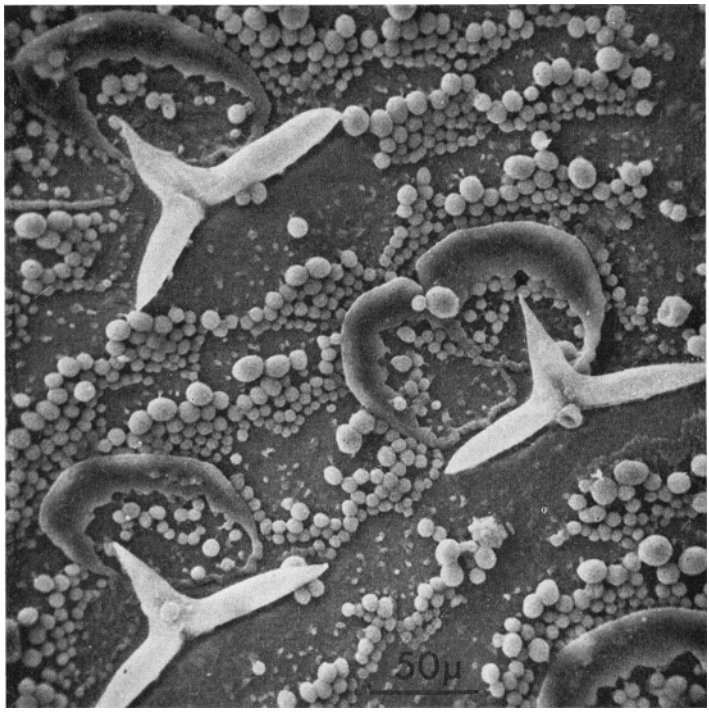


Fig. 179. — *Porcellionides pruinosus* (Brandt): scale-spines; SEM-photograph.

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

Metoponorthus pruinosus HILGENDORF, 1893a, p. 154; HILGENDORF, 1893b, p. 176; DOLLFUS, 1897, p. 210; DOLLFUS, 1898, p. 125; DOLLFUS, 1899, p. 256; PAULIAN DE FÉLICE, 1940a, p. 109.

Records from West Africa. - Senegal: Dakar; « cercle de Podor » (DOLLFUS, 1897); Dakar; cercle de Podor; Rufisque (DOLLFUS, 1898).

Togo (HILGENDORF, 1893a, 1893b).

Dahomey: Cotonou (PAULIAN DE FÉLICE, 1940a).

Cabinda: Landana (DOLLFUS, 1897).

Distribution. - This synanthropic species of Mediterranean origin now has a worldwide distribution.

Specimen examined. - Nigeria: Ios, 1 ♀, 9 mm long, (M.R.A.C.), leg. E. Bat Guong, 1964.

Sao Thome: Zampalma, 6 ♂♂, 8 ♀♀, max length 11 mm, (B.M.), leg. ?, 13.IX.1949; ? Zampalma, 4 ♂♂, 5 ♀♀, max length 9 mm, (B.M. No. 136), leg. ?, date ? (the tube also contains a label: « Luanda, Angola, Aug. 1949, L. F. Galbraith »).

Principe Island: Roça Infante Dr Henrique, 3 ♀♀, max length 9.5 mm, (M.G.), leg. L. Fea, 1.III.1901.

Annobon islands: 0-100 m, 1 ♂, 2 ♀♀, max length 7.5 mm, (M.G.), leg. L. Fea, IV-V.1902; 1 ♂, max length 10 mm, (B.M. No. 21), leg. Cambridge Univ. Expedition VII-VIII.1959.

Cameroon: Bile, 1 ♀, 6.5 mm long, (M.S.), leg. ?, VIII.1891.

D. Genus TURA Budde-Lund, 1908

Type-species: *Porcellio (Tura) testacea* Budde-Lund, 1908.

Diagnosis. - Back smooth covered with large scale-spines; frontal line absent; small adhering frontal lateral lobes; eyes with about 10 ommatides; peraeon segment 1 with hind margin not excavated: telson short, triangular; antenna short and thickset; flagellum with first joint much shorter than the second; maxillula with very short posterior spine on inner branch; teeth of outer branch not cleft; pseudotracheae with tube-like opening; uropod protopodite not forked on lateral margin (only a short triangular incision on distal edge).

Six (1) species are presently ascribed to the genus *Tura* inhabiting Ethiopia, Somalia, Europa Island and Aldabra Island, Madagascar. If the attribution to *Tura* is correct, *T. nigromaculata* is the only species found west of the great African lakes.

1. *Tura nigromaculata* Schmoelzer, 1974.

Tura nigromaculata SCHMOELZER, 1974, p. 167, figs.

Records from West Africa. - Chad: Fort Lamy; Bekao; between Mardengai and Faya-Largeau.

Distribution. - Known only from the above localities.

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(1) « *Leptotrichus* » *inquilinus* Koelbel, 1894 from « Somalia » probably belongs to this genus (BUDDE-LUND, 1913).

E. Genus URAMBA Budde-Lund, 1908

Type-species: *Lyprobius mus* Budde-Lund, 1898.

Diagnosis. - Back slightly granulated anteriorally, covered with enlarged scale-spines; frontal line present, lateral lobes hanging down laterally; eyes with about 20 ommatides; peraeon 1 segment with hind margin not excavated, except in *U. mus* (Budde Lund) — the type-species — in which all the epimera are extremely pronounced; telson triangular; antenna long and frail, flagellum joints subequal; maxillula with very long posterior point on inner branch; teeth on the outer branch not cleft; pseudotracheae as in *Tura*; uropod protopodite deeply forked on the outer surface.

Of the seven species ascribed to the genus *Uramba*, six are found in eastern Africa and one (the species quoted here) in Cameroon.

1. *Uramba charina* Schmoelzer, 1974.

Uramba charina SCHMOELZER, 1974, p. 165, figs.

Records from West Africa. - Cameroon: Mani, Lower Chari.

Distribution. - Known only from the type-locality.

XII. FAMILY ARMADILLIDIIDAE Sars, 1899

Able to conglobate; pleopod exopodites 1-2 are with *Porcellio*-like pseudotracheae; uropod exopodite is a flattened trapezoidal plate fitting into the outline of the abdomen and occupying the space between the telson and epimera of pleon segment 5; antenna with 2-jointed flagellum.

Essentially Mediterranean, this family is distributed with numerous genera and hundreds of species from Scandinavia in the north, to the Atlantic islands in the west, the oases and mountain chains in the Sahara in the south, and Syria and Persia in the east. Except for the synanthrope cosmopolitan *Armadillidium vulgare* (Latreille, 1804) and two or three other species transported by man, no members of this family occur outside the region delimited above. The species recorded in this paper may be an accidental introduction or, more probably, a labelling error.

A. Genus SCHIZIDIUM Verhoeff, 1901

Type-species: *Armadillidium Oertzenii* Budde-Lund, 1896.

Diagnosis. - Able to roll into a completely round, smooth ball; peraeon 1 segment with *schisma*; eyes with more than 10 ommatides.

This genus contains some six species, distributed between the Aegaean islands and Persia. For West African records see below.

1. *Schizidium* sp. [*fissum* (Budde Lund, 1885) or *festai* (Dollfus, 1894)].

Specimens examined. - ? Cameroon: Bibundi, 4 ♀♀, (M.S. No. 5548), leg. Junger, date ?

Distribution (of *S. fissum* and *S. festai*). - Cyprus, Lebanon, probably also Israel and Persia.

Remarks. - The examined specimens (only ♀♀) belong either to *S. fissum* or to *S. festai* (for a detailed description see STROUHAL, 1968). The labelling of the specimens says « W. C. of Africa, Bibundi, Junger ». As this locality is well outside the range of the two species, never recorded south of the Sahara, either the species has been introduced accidentally to Cameroon or the record is a labelling error. We believe the latter explanation to be the more probable as there are marked ecological differences between the home range of the species in question and the recorded locality in Cameroon.

SUMMARY

In this second part of our review of West African terrestrial Isopods, covering the region between Senegal and the Congo River, 58 species of the following families are treated: Tylidae (1), Ligiidae (2), « Trichoniscidae » (2), Styloniscidae (1), Rhyscotidae (4), Halophilosciidae (1), Philosciidae (27), Platyarthridae (11), Trachelipidae (2), Porcellionidae (7), Armadillidiidae (1). Our list includes the description of 36 species, for all of which new records are given, five new genera and 19 new species. The material studied comes from unpublished collections at the Museums of Genoa, London, Tervuren, Turin and Stockholm and from recent collections made by German zoologists.

ZUSAMMENFASSUNG

Im zweiten Teil unserer Bearbeitung der Landisopoden West-Afrikas (zwischen Senegal und Kongo-Mündung) werden 58 Arten der folgenden Familien behandelt: Tylidae (1), Ligiidae (2), « Trichoniscidae » (2), Styloniscidae (1), Rhyscotidae (4), Halophilosciidae (1), Philosciidae (27), Platyarthridae (11), Trachelipidae (2), Porcellionidae (7), Armadillidiidae (1). 36 Arten, darunter 5 neue Gattungen und 19 *novae species*, wurden untersucht und beschrieben. Das untersuchte Material besteht aus unveröffentlichten Aufsammlungen aus den Museen von Genua, London, Stockholm, Tervuren und Turin sowie aus Aufsammlungen, die in den letzen 6 jahren von deutschen Kollegen getätigt worden sind.

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