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ISOPODS¹

FROM THE WILLIAMS GALAPAGOS EXPEDITION

BY WILLARD G. VAN NAME²

(Plates VIII-XIX incl.)

The isopods collected by the Harrison Williams Expedition at the Galapagos Islands comprise eleven species, and are of especial interest as no less than nine of them are terrestrial forms, while up to the present time but three terrestrial isopods (two of them widely ranging species) have been recorded from the islands. The collection is a small one, totaling only about fifty specimens, and of necessity was hastily made at a few stations only, yet that so many species of these small creatures, inconspicuous in appearance and secretive in habits, were obtained, speaks highly for the diligence and industry of the naturalists of the expedition, and indicates moreover that future collecting will probably add to the list of Galapagos isopods a number of terrestrial as well as marine species.³ I wish to express my thanks to Mr. William Beebe for the opportunity of studying this collection.

The following are the eleven species obtained by the Harrison Williams Expedition and dealt with in the present article. Only the two which are marked with an asterisk were previously known from the Galapagos Islands or vicinity. Five of them are considered to be new species.

Suborder FLABELLIFERA (Marine)

Cirolana mayana Ives, 1891.? **Meinertia gaudichaudii* (Milne-Edwards), 1840.

Suborder ONISCOIDEA (Terrestrial)

Tylos latreilli Audouin and Savigny, 1826.*Philoscia culebroides*, sp. nov.*Philoscia williamsi*, sp. nov.*Philoscia nomae*, sp. nov.*Porcellionides pruinosis* Brandt, 1833.*Rhyscotus laxus*, sp. nov.* *Cubaris galapagoensis* Miers, 1877.*Cubaris beebei*, sp. nov.*Ligyda baudiniana* (Milne-Edwards), 1840.

The literature dealing with the Isopoda of the Galapagos Islands and vicinity is not extensive and refers mainly to marine species,

¹ Cont. Department of Trop. Research No. 184.² Contribution from the Laboratory of Invertebrate Zoology of the American Museum of Natural History, New York.³ Beebe (Galapagos, World's End, p. 329) mentions the relative abundance of isopods among the few land invertebrates on Tower Island.

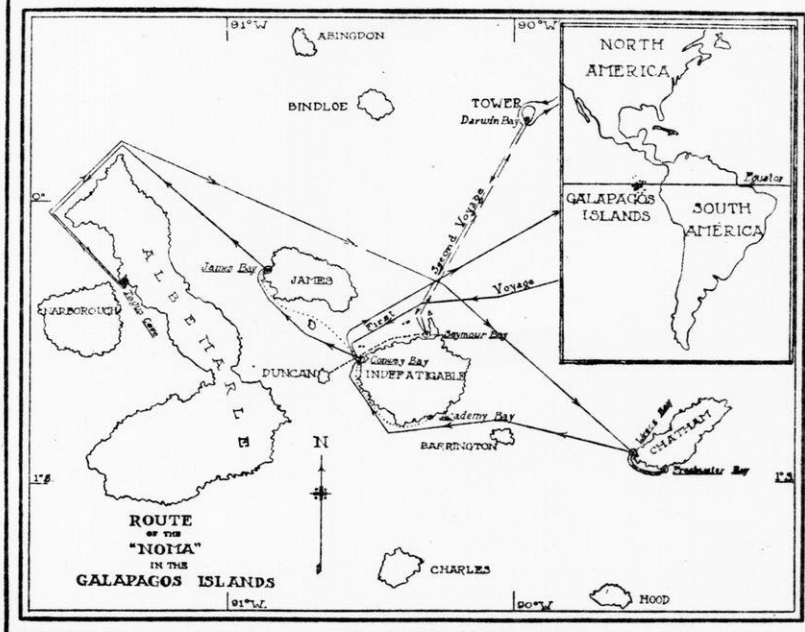
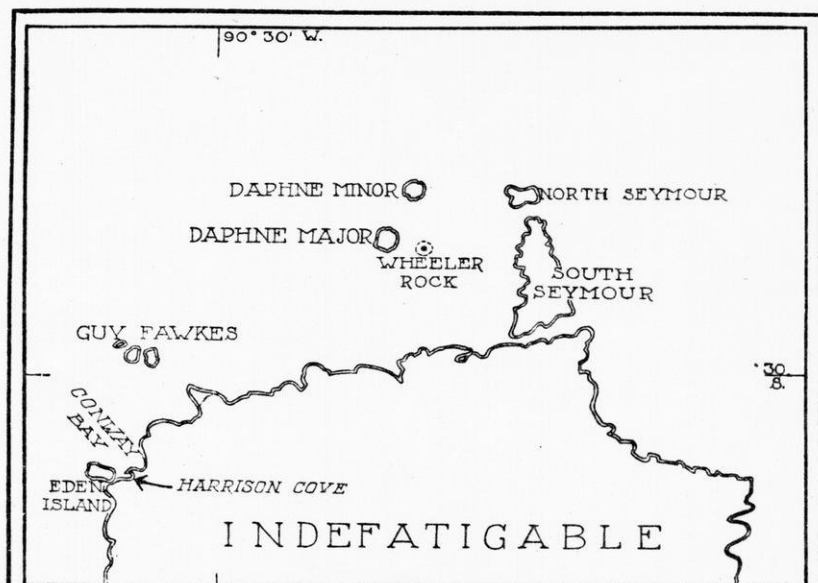


Plate A. SKETCH MAP OF GALAPAGOS ISLANDS
Route of the *Noma*, and details and location of the Archipelago.

many of them from deep water. It comprises two short articles by Richardson (1901, 1913; see bibliography at the end of this article) and Hansen's (1897) account of those collected by the U. S. *Albatross* in 1891. Other references and descriptions are scattered, and are noted in the following pages under the species to which they apply.

I have found the following isopods, only sixteen in number even when deep sea forms are included, recorded from the islands and neighboring waters.

Suborder CHELIFERA

Family TANAIDAE

Tanais stanfordi Richardson.

Tanais stanfordi Richardson, 1901. *Proc. Washington Acad. Sci.*, III, p. 565, figs. 58-60.

Clipperton Island lagoon.

Family APSEUDIDAE

Apseudes galapagensis Richardson.

Apseudes galapagensis Richardson, 1913. *Proc. U. S. Nat. Mus.*, XLIII, p. 159, figs. 1, 2.

Albatross Station 2807, off Chatham Island, 812 fathoms.

Suborder FLABELLIFERA

Family AEGIDAE

Aega acuminata Hansen.

Aega acuminata Hansen, 1897. *Bull. Mus. Comp. Zool. Harvard*, XXXI, p. 104, pl. II, figs. 3-3b.

Albatross Station 3403, Lat. $0^{\circ} 58' 30''$ S., Long. $89^{\circ} 17'$ W., 384 fathoms.

Aega longicornis Hansen.

Aega longicornis Hansen, 1897. *Bull. Mus. Comp. Zool. Harvard*, XXXI, p. 106, pl. II, figs. 5-5b; pl. III, figs. 1-1a.

Albatross Station 3402, Lat. $0^{\circ} 57' 30''$ S., Long. $89^{\circ} 3' 30''$ W., 421 fathoms.

Aega plebeia Hansen.

Aega plebeia Hansen, 1897. *Bull. Mus. Comp. Zool. Harvard*, XXXI, p. 105, pl. II, figs. 4-4d.

Albatross Station 3402, Lat. $0^{\circ} 57' 30''$ S., Long. $89^{\circ} 3' 30''$ W., 421 fathoms; also other stations to depths of 978 fathoms.

Family CYMOTHOIDAE

Meinertia gaudichaudii (Milne-Edwards).

Ceratothoa gaudichaudii Milne-Edwards, 1840. See Schioedte and Meinert, 1881-1883, *Naturhist. Tidsskr.* (3) XIII, p. 335, pl. XIII, figs. 11-15; pl. XIV, figs. 1-5.

Widely distributed in the Pacific; parasitic in mouth of fish of the genus *Thunnus* and allies. Black Bight, Albemarle Island and 200 miles north of Wenman Island (Richardson, 1901, p. 568). Young specimen, probably this species, collected by the Harrison Williams Expedition.

Cymothoa exigua Schioedte and Meinert.

Cymothoa exigua Schioedte and Meinert, 1884. *Naturhist. Tidsskr.* (3) XIV, p. 232, pl. VI, figs. 7, 8, and Richardson, 1905, p. 250, fig. 261.

Charles Island, from mouth of fish *Citharichthys sordida*.

Aegathoa excisa Richardson.

Aegathoa excisa Richardson, 1901. *Proc. Washington Acad. Sci.*, III, p. 567, fig. 61. Nierstrasz, 1915, *Zool. Med. Rijks Mus. Nat. Hist. Leyden*, p. 103. Monod, 1922, *Assoc. Franc. Avanc. Sci., Congrès de Montpellier*, 1922, pp. 405, 409.

From the fin of a dolphin (*Coryphaena hippurus*) in Lat. 5° N., Long. 90° W.

Suborder VALVIFERA

Family ARCTURIDAE

Arcturus abyssicola Beddard.

Arcturus abyssicola Beddard, 1886. (See *Rept. Voy. Challenger* XVII, part 1, p. 98, pl. XXI, figs. 5-8.) (Description by Beddard from a specimen dredged near the Low Archipelago in 2885 fathoms and doubtful specimens from between Australia and New Guinea, 1400 fathoms.)

Albatross Station 2807, off Chatham Island, 812 fathoms (Richardson, 1913, p. 159).

Suborder ASELOTA

Family MUNNOPSIDAE

Eurycope pulchra Hansen.

Eurycope pulchra Hansen, 1897. *Bull. Mus. Comp. Zool. Harvard*, XXXI, p. 97, pl. I, figs. 1-14.

Albatross Station 3413, Lat. 2° 34' N., Long. 92° 6' W., 1360 fathoms, also one other station in 1471 fathoms.

Eurycope scabra Hansen.

Eurycope scabra Hansen, 1897. *Bull. Mus. Comp. Zool. Harvard*, XXXI, p. 100, pl. I, figs. 2-2d; pl. II, fig. 1.

Albatross Station 3413, Lat. 2° 34' N., Long. 92° 6' W., 1360 fathoms.

Munnopsis longiremis Richardson.

Munnopsis longiremis Richardson, 1913. *Proc. U. S. Nat. Mus.*, XLIII, p. 161, figs. 3, 4.

Albatross Station 2807, off Chatham Island, 812 fathoms.

Suborder EPICARIDEA

Family BOPYRIDAE

Cryptone elongata Hansen.

Cryptone elongata Hansen, 1897. *Bull. Mus. Comp. Zool. Harvard*, XXXI, p. 112, pl. III, figs. 5-5a; pl. IV, figs. 1-1g; Richardson, 1899, *Proc. U. S. Nat. Mus.*, XXI, 1899, p. 869; *Ann. Mag. Nat. Hist.* (7) IV, p. 338; Bouvier, 1900, *Trav. Stat. Zool. Wimeroux*, VIII, p. 285; Richardson, 1904, *Proc. U. S. Nat. Mus.*, XXVII, p. 87; 1905, *Bull. No. 54, U. S. Nat. Mus.*, p. 520, fig. 567 (after Hansen).

Albatross Station 3407, Lat. 0° 4' S., Long. 90° 24' 30" W., 885 fathoms, parasitic on the shrimp *Nematocarcinus agassizii* Faxon.

Suborder ONISCOIDEA

Family ONISCIDAE

Porcellio laevis Latreille.

Porcellio laevis Latreille, 1804. (Very widely distributed, especially in the warmer parts of the world, but also in temperate regions. See Richardson, 1905, p. 614 and Budde-Lund, 1885, p. 138, for synonyms, distribution, etc.) Chatham Island (Hansen, *Bull. Mus. Comp. Zool. Harvard*, XXXI, p. 124; Richardson, 1905, p. 615, fig. 666).

Cubaris galapagoensis Miers.

Cubaris galapagoensis Miers, 1877? *Proc. Zool. Soc. London*, 1877, p. 74, pl. XII, figs. 2-2c.

Charles Island (Miers). Collected also by the Harrison Williams Expedition.

Family LIGYDIDAE

Ligyda exotica (Roux).

Ligia exotica Roux, 1828. Widely distributed on the shores of tropical and subtropical regions. See Richardson, 1905, p. 676, figs. 716-718, and Van Name, 1918, *Bull. American Mus. Nat. Hist.*, XLIII, p. 72, for synonyms).

"Guadaloupe and Clipperton Island" (Richardson, 1901, p. 568, under name *Ligia exotica*).

DESCRIPTIONS OF SPECIES COLLECTED

Suborder FLABELLIFERA

Family CIROLANIDAE

Genus *Cirolana* Leach, 1818*Cirolana mayana* Ives.

Cirolana mayana Ives, 1891, *Proc. Acad. Nat. Sci. Philadelphia*, ann. 1891, p. 186, pl. VI, figs. 3-10; Richardson, 1901, *Proc. U. S. Nat. Mus.*, XXIII, p. 512; Moore, 1902, *Bull. U. S. Fish Comm.*, XX, part 2, p. 166, pl. VIII, figs. 1-5; Richardson, 1905, *Bull. 54, U. S. Nat. Mus.*, p. 87, figs. 66-70; Boone, 1921, *Univ. of Iowa Studies*, IX, No. 5, p. 92.

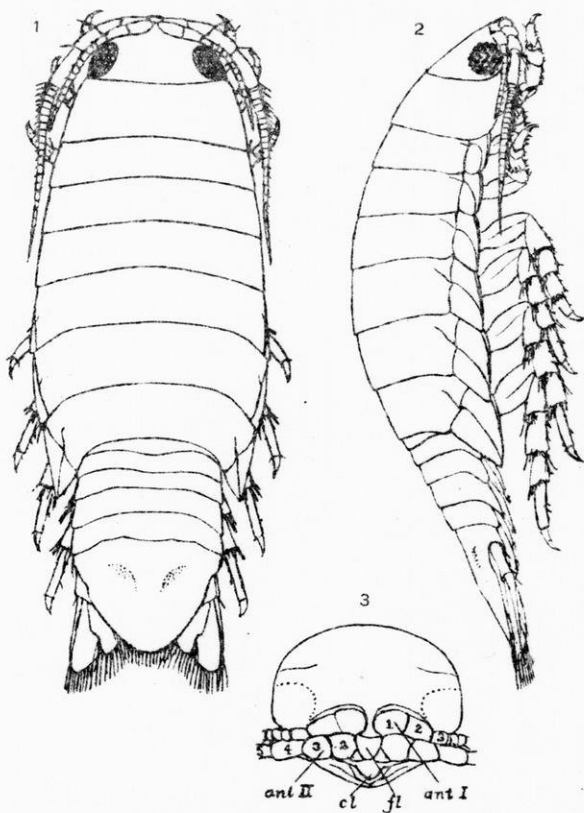


Plate VIII. 1-3, *Cirolana mayana* Ives, 1891. Dorsal and lateral views, $\times 11$, and front view of head, $\times 15$; ant. antennae; cl. clypeus; fl. frontal lamina.

(Plate VIII, figs. 1-3).

This is a species widely distributed on the West Indian region and the Caribbean Sea, and reported also from San Francisco Bay, Lower California, by Richardson (1905, p. 87), who examined a large number of specimens from the last named locality without being able to detect any specific differences separating them from West Indian localities. It is represented in the Galapagos collection by a single specimen 8.3 mm. long, which I have compared with specimens from Porto Rico, Dominica, and Andros Island, Bahamas, likewise without finding any basis for separating the Pacific and West Indian forms.

The head has its anterior border produced into a small triangular point between the bases of the first antennae. This point meets the frontal lamina extending up from below; the latter, seen in an anterior view, forms a small

convex keystone-shaped plate separating the bases of the second antennae; in a strictly dorsal view this plate is only narrowly visible and projects but little beyond the curve formed by the basal segments of the first antennae which form the front outline of the body when seen from that aspect. The first antennae have the two basal segments of the peduncle broad and flattened, though their width shows chiefly in an anterior view of the head; the third is much smaller and narrower; the flagellum, which is slender and has 13 articles in the present specimen, reaches near the posterior end of the first thoracic segment when drawn back. The second antennae have five segments in the peduncle, but the basal one is reduced and entirely concealed by the second in a dorsal view, and almost entirely so even in a front view of the head; the flagellum is stout and reaches well back along the fourth thoracic segment; it has 23 articles in this specimen. The anterior end of the clypeus is free and forms a rounded-triangular, downwardly and forwardly projecting process on the underside of the head in front of the mouth. The legs are stout, laterally compressed and provided with numerous stout spines. The abdomen is wide; its segments are all distinct; only the fourth segment has the lateral angles produced into prominent posteriorly directed points. The telson bears, as do the branches of the uropoda, a fringe of rather short hairs on the posterior part of the border. The telson has a pair of shallow depressions on the basal part of the upper surface and is rounded behind, but rather more narrowly so than is represented in the previously published figures (this is true of the West Indian specimens examined also). The internal branches of the uropoda scarcely exceed the telson; they are wide and have the external border emarginate. The external branch appears to present a good character for distinguishing this from other American species of the genus in its unusual length, as it exceeds the internal branch in length by about one-fifth. Color yellowish, with blackish pigment in irregular stellate dots on the back.

For further details the reader is referred to Richardson, 1905, p. 87.

The Galapagos specimen, the first record from those islands, was taken in damp sand on the shore of Indefatigable Island (Collector's number 2014). It is not fully grown; the species reaches over 12 mm. in length.

Family CYMOTHOIDAE

Genus *Meinertia* Stebbing, 1893

? *Meinertia gaudichaudii* (Milne-Edwards).

- Cymothoa gaudichaudii* Milne-Edwards, 1840, *Hist. Nat. Crust.*, III, p. 271.
Ceratothoa rapax Heller, 1865, *Reise Novara, Crust.*, p. 146, pl. XII, fig. 17.
Ceratothoa gaudichaudii Schioedte and Meinert, 1883, *Naturh. Tidsskr.* (3) XIII, pp. 335-340, pl. XIII, figs. 11-15; pl. XIV, fig. 5.
Meinertia gaudichaudii Stebbing, 1893, *Hist. Crust.*, p. 345; Richardson, 1899, *Proc. U. S. Nat. Mus.*, XXI, p. 829; 1899, *Ann. Mag. Nat. Hist.*, (7) IV, p. 171; 1901, *Proc. Washington Acad. Sci.*, III, p. 568; Stebbing, 1902, in Willey, *Zool. Results*, p. 643; Richardson, 1905, *Bull.* 54, *U. S. Nat. Mus.*, p. 237, figs. 241-245; 1910, *Proc. U. S. Nat. Mus.*, XXXVIII, p. 79, figs. 1, 2.

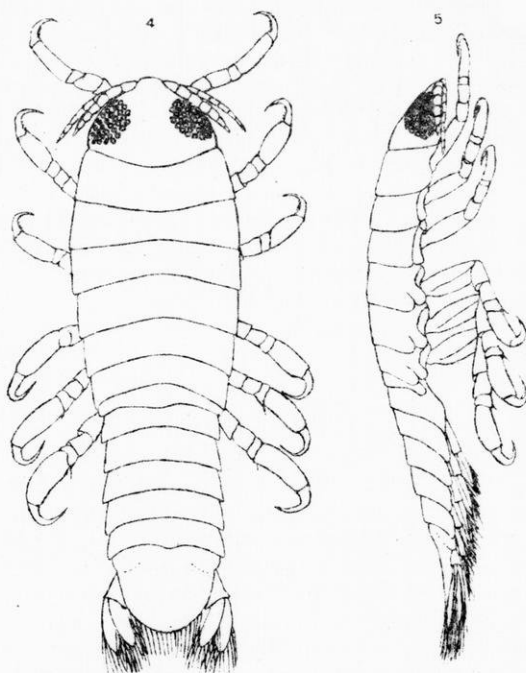


Plate IX. 4-5, young individual, probably *Meinertia gaudichaudii* (Milne-Edwards), 1840. Dorsal and lateral views, X about 18.

(Plate IX, figs. 4-5).

The larval isopod, 4.1 mm. long, shown in Figs. 4 and 5 is in too early a stage for sure identification in the absence of other specimens in stages to connect it with the adult, but I refer it here provisionally, rather than to any allied species, largely on the ground that *M. gaudichaudii* is a widely distributed and apparently common Pacific species that has been twice recorded from the Galapagos Islands and their vicinity.

As far as I am aware, the only figure and description of the young of this species is that given by Schioedte and Meinert (1883, *Naturhist Tidsskr.* (3) XIII, p. 339, Pl. XIV, fig. 5; figure reproduced in Richardson 1905, Fig. 243) which represents a younger individual only 3.7 mm. long. The differences between this and the present specimen are, I think, explainable by the greater age and more advanced development of the latter.

In alcohol the specimen is yellowish with the usual irregularly stellate black pigment spots on the upper parts. The first antennae reach, when drawn back, to about the rear corner of the head and are somewhat thick and inflated, consisting of 7 segments. These arise quite close together. The second antennae are longer and much slenderer, consisting of 9 segments and reaching half way along the first thoracic segment. The eyes are large and well pigmented and contain 7 rows of ocelli, with 8 in the longest row.

The six pairs of thoracic limbs are rather long and, excepting the first pair, rather stout. They are laterally compressed, with well developed hooked dactyli, which on the three anterior pairs have a few rather poorly developed dentations on the basal third of their concave aspect, those of the others appear practically smooth. Spines were not demonstrated on the propodus of any limb; the carpus of the posterior pairs, however, is provided with a distally situated spine. The propodus of the second pair is noticeably expanded. The posterior three legs have the thighs keeled, and are noticeably larger and longer than the anterior ones, increasing successively in length and stoutness.

The telson is moderately wide and smoothly rounded behind. It is exceeded a little by the rather narrowly oval branches of the uropoda, which, as well as the rear border of the telson itself, bear a fringe of hairs.

Meinertia gaudichaudii is reported to be found parasitic in the mouth of species of *Thunnus* (tunnies). Its previously reported range includes the American Pacific coast from Mazatlan to Chile, and the Louisiade Archipelago southeast of New Guinea (Richardson, 1905, 1910), as well as the following Galapagos localities (Richardson, 1905): Black Bight, Albemarle Island, and 200 miles north of Wenman Island.

The present immature specimen was found attached just behind the gills of a fish (*Trachinotus paloma*) in Conway Bay, Indefatigable Island, March 29, 1923.

Suborder ONISCOIDEA

Family TYLIDAE

Genus *Tylos* Latreille, 1829

The isopods of this genus, which constitutes a family by itself, are distinguished from the other terrestrial forms by having the uropoda modified to form, in conjunction with inwardly directed plate-like processes of the fourth and fifth abdominal segments, a cover or operculum for the other abdominal appendages which they entirely conceal. The uropoda are therefore visible only in a ventral view of the abdomen.

Tylos latreilli Audouin and Savigny.

Tylos latreilli Audouin and Savigny. 1826, *Descript. Égypte*, p. 285, pl. XIII, fig. 1 (fide Richardson); Budde-Lund, 1885, *Crust. Isop. Terrest.*, p. 273; Richardson, 1902, *Trans. Connecticut Acad. Sci.*, XI, p. 300, pl. XL, fig. 56; 1905, *Bull. No. 54, U. S. Nat. Mus.*, p. 586, figs. 646, 647.

(Plates X-XI, figs. 6-10).

See Budde-Lund, 1885, p. 273, for other synonyms and references.

This is a species widely distributed in the Mediterranean region. It has been recorded also from Odessa, Russia and in the New World from the Bermudas, Santa Marta, Colombia, and Florida. There are specimens in the Galapagos collection which I do not feel justified in separating specifically from this form. For comparison I have had available specimens from Adria, Italy, received from Dr. Karl W. Verhoeff, and others from Porto Rico and Key Largo, Florida, in the American Museum collections.

From the Italian and Porto Rican specimens, the Galapagos examples differ in a few minor points, notably in having the narrow upper end of the

epistome less prominently raised above the surface of the forehead, into which it passes with a less conspicuously impressed suture. Moreover in the Galapagos specimens the lobes of the head below the eyes are always wide and broadly truncated, though more variable in form in the others, and the rear end of the body (and of the opercular valves) is somewhat more broadly rounded. The telson moreover has its lower or terminal border always straight without any trace of the slight tendency to emargination usually noticeable in the specimens from the other localities. Nevertheless these differences are slight

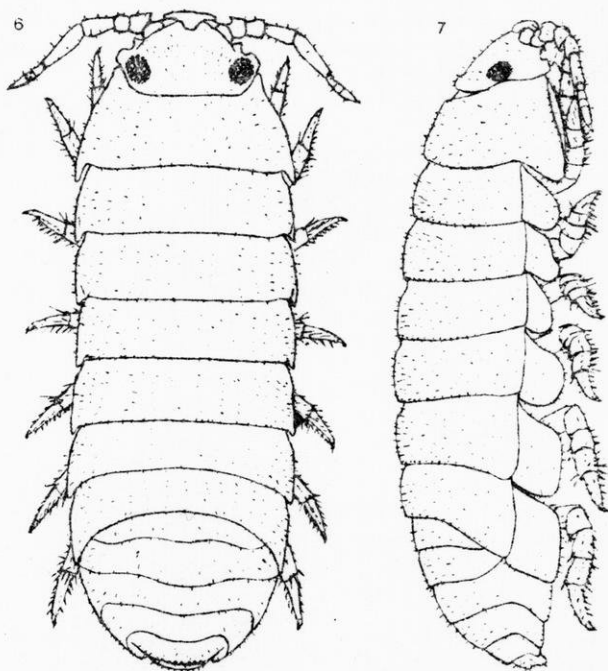


Plate X. 6-7, *Tylos latreilli* Adouin and Savigny, 1826. Dorsal and side views. $\times 8.75$.

and apparently more or less inconstant, and I am unwilling with the material available to attribute much weight to them, since the Florida specimens are more or less intermediate, approaching more those from the Galapagos. It is not unlikely that a species so widely distributed will prove divisible into geographical races, but I do not feel that such a division should be attempted without much more material, collected at more numerous localities, than I have at hand.

As in the case of many other widely distributed and supposedly well known species, the published figures and descriptions leave a good deal to be desired, so that the following notes on, and figures of, the Galapagos specimens seem worth including here.

Body of oblong outline, rounded before and behind when seen from above. It can be rolled up into a ball. Back highly arched; body surface minutely granular and slightly uneven, but no actual tubercles are developed except a few minute ones on the front of the epistome and clypeus. The surface of the body, limbs and antennae bears rather thinly scattered short, stiff hairs or minute setae, rising from minute depressions, which latter are more conspicuous and form a definite row along the rear border of the segments. The largest specimen, probably a male, is 10 mm. long. The others are all considerably

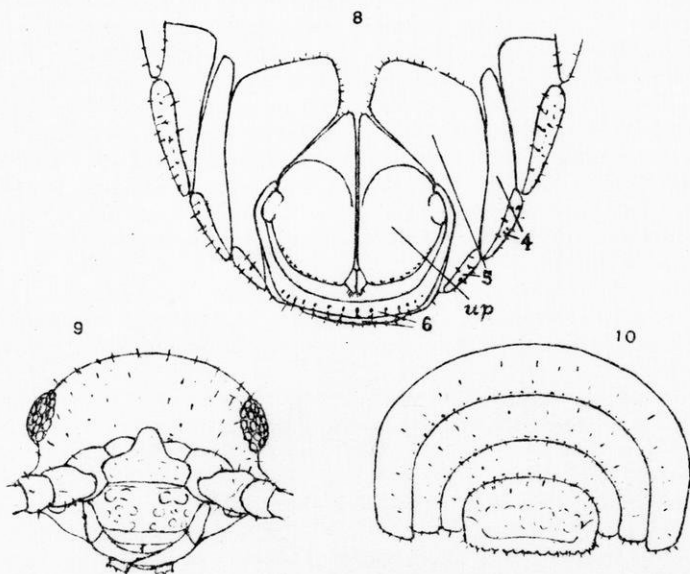


Plate XI. 8-10, *Tylos latreilli* Audouin and Savigny, 1826. 8, ventral view of abdomen and opercular plates formed by the uropoda (*up*) and segments 3, 4, and 5 of the abdomen, $\times 18$. 9, front view of head $\times 14.5$. 10, rear end of body, $\times 14.5$.

smaller and evidently not adult. Color white with scattered minute blackish pigment spots.

Head well set back into the thorax; narrowed toward the front and provided with a truncated obliquely projecting lobe under each eye. In front of this lobe (between it and a wide notch occupied by the base of the second antennae) there is a small pointed lobe. The extreme front of the head is formed by the somewhat triangular epistome, below which the clypeus forms a transversely oblong plate.

Eyes well developed, with nearly 30 ocelli. Second antennae rather short, with a five-jointed peduncle, unless a small movable plate on the anterior surface of the head above each lateral wing of the epistome may be the rudiment of an additional joint. The terminal joint of the peduncle is the longest, and bears a flagellum which about equals that joint in length and which is divided into four articles. The first article is somewhat curved and

bears at its proximal end a small tubercle on its upper outer aspect. The third article is the longest; the fourth is reduced to a mere conical point.

The thoracic segments each have a considerable degree of individual curvature in an antero-posterior direction, and have the exposed part considerably but not abruptly raised above the part which slips under the segment in front. The thoracic segments except the first have the epimera distinctly articulated. The first segment has the posterior lateral corner well extended back and narrowly rounded at the apex of the somewhat acute angle which it forms. The inferior margin of the segment is not reflected outward to form a border, but it is double, owing to the existence of a narrow sulcus which extends along the anterior four-fifths of its length. The sulcus is slightly oblique in position so that it is visible in a lateral as well as in a ventral view of the segment, and it gradually closes posteriorly without forming a notch. None of the succeeding segments bear coxopodite processes. The thoracic epimera are rounded, except those of the sixth and seventh which are more squarely cut off. The epimera of the third, and especially of the fourth segments, are so small as to suggest that they have been injured or deformed, but this is normal. The legs are rather short and fairly stout, and of somewhat compressed cross section. They are unusually spinous.

The telson is transversely oblong, with the upper margin arched. A rough transverse ridge or elevation crosses its surface near the rear or inferior border which projects a little farther ventrally than the border of the other abdominal segments.

The form of the opercular plates is shown in fig. 8. Those of the fifth abdominal segment do not come together on the median line.

Five specimens were collected under dead wood and slabs of lava, on Tower Island, April 29th, 1923. Collector's number 2471.

I may add that in *Tylos spinulosus* Dana, 1853, from Tierra del Fuego, (Dana, 1853, p. 717, Atlas, 1855, Pl. XVIII, figs. 1a-1c) the antennae have a three-jointed flagellum and Dana's figure of the antennae shows an appendage entirely different in proportions and segmentation from those of the present species, so that it appears to be distinct generically.

Family ONISCIDAE

Genus *Philoscia* Latreille, 1804

This genus, which comprises a large number of species, many of them of minute size and distinguishable from each other only with considerable difficulty, is represented in tropical and South America by many forms, the larger part of them still undescribed, while only more or less inadequate descriptions and illustrations are available in the case of many of those that have come to the notice of zoologists. In the Galapagos collection the genus is represented by six specimens, all of them more or less unsatisfactory on account of loss of parts or immaturity, but no less than three apparently perfectly distinct species are represented. I cannot identify them with any previously described forms, at least not with the information about the latter that is now available.

While under ordinary circumstances the description of new species of this perplexing group on the basis of such inadequate material would be entirely inexcusable, the exceptional interest which pertains to the land fauna of the Galapagos Islands seems to justify an exception in this case, especially since the remote and narrowly limited habitat greatly diminishes the probability of introducing more confusion into the already unsatisfactory understanding that we have of this genus, and will probably make the recognition of the forms by future collectors on the islands easy, even though the limitations in the amount and condition of the material prevent the descriptions being as full as they should be.

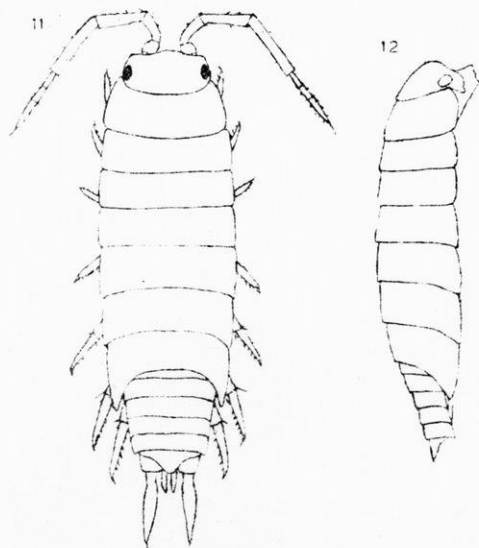


Plate XII. 11-12, *Philoscia culebroides*, new species. Dorsal view and lateral outline of body of male, $\times 24$.

***Philoscia culebroides*, sp. nov.**

(Plate XII, figs. 11-12).

The single specimen in the collection is a male a little under 2.5 mm. long. The color is the usual purplish brown above with irregular oblong light markings on the dorso-lateral regions, and whitish below, that is commonly found in this group. The body surface is quite smooth and shows little trace of pubescence, though the antennae bear scattered, short, stiff hairs. The integument is extremely soft, perhaps because of recent moulting. The body is narrow, the abdomen large and but little narrower than the thorax at its anterior end. It forms nearly one-fourth of the body length.

The head is wide and has the front outline sinuously curved when seen from above so that it is slightly prominent in the middle and under each eye. The sides of the head reach down into a large, somewhat square lobe-like ex-

tension below each eye, but this is appressed to the side of the head and does not project either laterally or forward. The eyes are well developed and pigmented. The second antennae are fairly long, reaching beyond the third thoracic segment when well drawn back. Their flagellum is elongate and has the two first articles about equal; the third or terminal article is considerably the longest and bears a strong terminal bristle.

The first three thoracic segments have the posterior lateral angles more or less rounded and not extended backward. The others are not rounded off, and extend backward in a progressively increasing degree.

The legs are moderately long, rather stout, and have well developed spination. I could not distinguish any special modification of the anterior pair or pairs of legs, except that, as usual, they are shorter and proportionately stouter than those farther back.

The abdomen does not taper so much as in many allied species. The posterior lateral angles of the third, fourth and fifth abdominal segments are only produced backward to an insignificant extent. The telson is obtusely triangular with the tip considerably rounded off and the sides a little concave. The inner branches of the uropoda are small, but the outer ones, which are of more or less terete cross section, are large and long, about equaling in length the telson and the three preceding segments taken together.

This specimen is very close to *Ph. culebrae* Moore, 1902 (See Bull. U. S. Fish. Comm., XX, Part 2, p. 176, Pl. XI, figs. 13-17; also Richardson, 1905, p. 604, Fig. 660), from Culebra Island near Porto Rico, but I cannot refer it to that species on account of differences in the form and proportion of certain parts of the body. In the Galapagos specimen the head is proportionately wider, the downwardly projecting lobes under the eyes larger and more extended at the posterior ventral angle; the antennae longer, the first two joints of their flagellum more nearly equal; the abdomen somewhat larger and telson longer in proportion to its width.

The label bears the collector's number 2416. The specimen was taken on the underside of a slab of lava on Tower Island, April 28th, 1923.

***Philoscia williamsi*, sp. nov.**

(Plate XIII, figs. 13-15).

Named for Mr. Harrison Williams, patron of the expedition.

This species appears to be a member of the same division of the genus as the one last described. As in that species, the front outline of the head is slightly (though only very slightly) sinuous, less even than in *Ph. culebroides*, and the sides of the head are prolonged downward below the eyes as small, somewhat square appressed lobes, but smaller than in that species. In coloration it is similar also, but the body surface is less smooth and is noticeably pubescent with short stiff hairs. The largest specimen is a female bearing a number of large young in the marsupium, which is distended so that it is difficult to see how the animal could have walked. Body length a little over 3.5 mm. There are also two considerably smaller specimens, one a male, one a female, which are evidently immature.

As is well shown by a comparison of the figures of the two species, the body

is broader in the present one, the head narrower and smaller, the abdomen much smaller (unusually small in fact), and more tapering, the telson shorter and more broadly rounded at the tip, and the branches of the uropoda proportionately very short and small.

The antennae in the only adult individual are unfortunately broken off. The smaller specimens have the antennae, which are pubescent and quite long, but as the relative length of the antennae to that of the body varies with age, their length in the adult can only be guessed at and their restoration (in broken lines) in the figure must be regarded as somewhat conjectural in that respect. The first article of the flagellum is quite short and is equaled or a little exceeded by the second, and much exceeded by the third, which bears a terminal bristle. The eyes are well pigmented and have few though large ocelli.

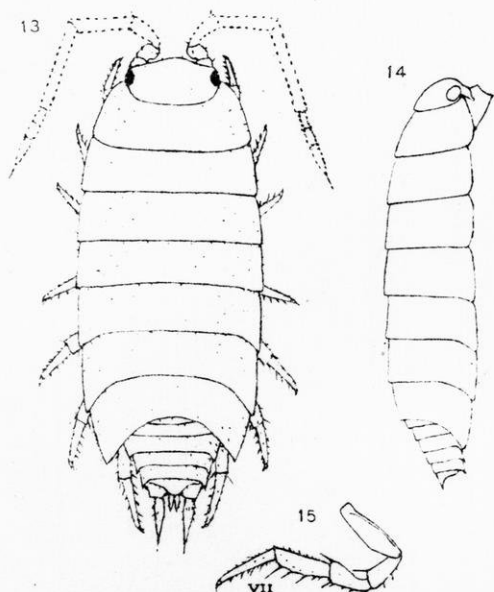


Plate XIII. 13-15, *Philoscia williamsi*, sp. nov. 13 and 14, dorsal view and lateral outline of body of female. $\times 18$. 15, seventh leg $\times 21$.

As compared with *Ph. culebroides* this species has the lateral ends of the last four thoracic segments more squarely cut off and with the angles a trifle sharper. The corresponding angles of the third, fourth and fifth abdominal segments are produced back into more prominent triangular points than is the case in that species.

I was unable to distinguish any special modification of the anterior pair or any pair of legs in the male. Though the immaturity of the specimen may make this observation somewhat inconclusive, it appears, when taken with the resemblances in the head, to support the view expressed above that this form is also a member of the same section of *Philoscia* as *Ph. culebrae* Moore, 1902.

Collector's number of the three specimens 2232. They were collected under lava blocks on Tower Island, April 18th, 1923.

***Philoscia nomae*, sp. nov.**

(Plate XIV, figs. 16-18).

With *Philoscia culebroides*, described above, was a mutilated example of a much broader species, having the body surface very smooth and shining and very long legs with well developed spines. The head and antennae, part of the first thoracic segment, and the uropoda are missing. The specimen is a female. Though it resembles *Ph. williamsi*, just described, in color and in the small tapering abdomen, it differs in the following characters:

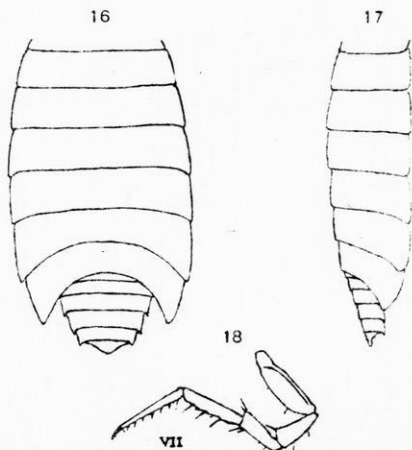


Plate XIV. 16-18, *Philoscia nomae*, sp. nov. 16, 17, outline of body of female, dorsal and lateral views, $\times 10.2$. 18, seventh leg $\times 12$.

Larger size; the specimen if entire would measure about .5 mm. long; much longer and slender legs (compare figs. 15 and 18 representing the seventh legs of each); only the last three instead of the last four thoracic segments have the posterior angles noticeably extended back (their apices are also less sharp than in *Ph. williamsi*); the telson is obtusely triangular, the apex being little rounded off and the sides practically straight. Being a female the specimen gives no information as to possible secondary sexual characters in the anterior legs, and its incomplete condition makes it difficult to determine its nearest relationship, or identify it with any described species, but its position in this genus seems to be evident.

Collector's number 2416. Taken under lava on Tower Island, April 28th, 1923.

Genus (or subgenus of Genus *Porcellio* Latreille, 1804)

Porcellionides Miers, 1877

Stebbing (Rec. Indian Mus. Calcutta, VI, p. 188, 1911) has shown that the commonly accepted name *Metoponorthus* Budde-Lund, 1879, is antedated

by and a synonym of *Porcellionides* Miers, 1877, which must therefore be used for this group whether it be treated as a genus or only a subgenus.

Porcellionides pruinosos (Brandt).

Porcellio pruinosus Brandt, 1833, *Bull. Soc. Imp. Nat. Moscou*, VI, p. 19.

Porcellio maculicornis Koch, 1835-1844, *Deutschl. Crust.*, p. 34.

Metoponorthus pruinosus Budde-Lund, 1885, *Crust. Isop. Terrest.*, pp. 169, 171; Sars, *Crust. Norway*, II, p. 184, pl. LXXX, fig. 2; Richardson, 1905, *Bull. 54, U. S. Nat. Mus.*, p. 627, fig. 674; Racovitza, 1908, *Arch. Zool. Exper. et Gen.* (4) IX, p. 386.

Porcellionides pruinosus Stebbing, 1911, *Rec. Indian Mus. Calcutta*, VI, p. 189.

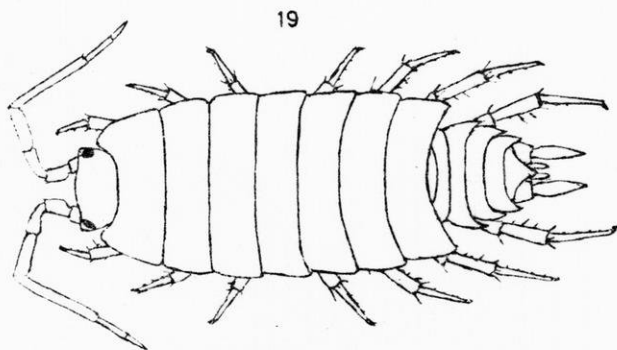


Plate XV. 19, *Porcellionides pruinosus* Brandt, 1833. Dorsal view of female, $\times 7.5$.

(Plate XV, fig. 19).

Many other of the numerous synonyms and references to this species are listed in the above works of Budde-Lund and Richardson.

This species of almost world wide distribution, common in nearly every country in the vicinity of human habitations, hardly needs description here. It is of rather flattened form, the back with slightly developed small granular tubercles. The legs of the posterior part of the body are long and slender, but those of the anterior part are much shorter. The long antennae with a two-jointed flagellum in which the proximal joint is long and slender, and the terminal one considerably shorter, are one of the most conspicuous characters by which the species may be recognized.

Six specimens (the largest a female only about 8 mm. long and probably not fully grown) were obtained by the Galapagos Expedition.

Five specimens (Collector's numbers 2403, 2416, 2471) were taken in April, 1923, on Tower Island; one specimen (number 2306) was collected on Indefatigable, April 22nd, 1923. All were found resting motionless on the under-side of lava slabs.

Genus *Rhyscotus* Budde-Lund, 1885

A small but widely distributed group of very small isopods distinguished by the great bulbous enlargement of the epistome which is well marked off from

the rest of the head, and the very wide, short maxillipeds which have the palp and molar portions also very wide and proportionately short. For a diagnosis and synopsis of the genus see Budde-Lund, 1906, in Voeltzkow, Wiss. Ergeb. Reise in Ostafrika, II, p. 298 ff. That author has made it the type and only genus of a subfamily (Rhyscotinae) of the Oniscidae, and in the above work divides it into two sections, to which however he does not assign names. *Hypergnathus* Richardson, 1905, is regarded by him as insufficiently distinguished from *Rhyscotus*. It is based on a species from Texas.

***Rhyscotus laxus*, sp. nov.**

(Plate XVI, figs. 20-22).

Body long and narrow, and moreover so loosely articulated that considerable motion of the segments in a longitudinal direction is possible, while the soft integument permits of a varying degree of lateral spread of the free lateral ends of the segments. The illustration here given shows the segments quite closely approximated, so that, seen from above, the outline is that of a long narrow ellipse. Many of the preserved specimens are more relaxed and longitudinally extended, so that they exhibit a more parallel-sided outline.

Body surface evenly, but not very thickly, covered with short hairs or setae, visible only on considerable magnification. The antennae, uropoda and legs are also more or less setose. Along the free borders of the segments the setae are a little longer and stouter and form a regular row, closer together than on the general surface of the body.

In the alcoholic specimens, the back, excepting a border along the free margins of the segments, an irregular area of variable but considerable extent near each lateral end of each segment of the thorax, also numerous smaller oval spots on the median parts of the thoracic segments and on the head, is slaty gray; below considerable gray pigment is also found on the maxillipeds, first thoracic legs, and on the abdominal segments and pleopoda, except the first pair; the antennae are also quite deeply pigmented above and below, except the second and third joints. Most of the under parts and limbs and the entire uropoda, both above and below, as well as the above mentioned spots and areas on the back, are unpigmented, appearing whitish or translucent with little or no tinge of yellow. There is much individual variation in the relative extent of the pigmented and unpigmented parts.

The length of the largest specimens ranges from 4.25 to about 5 mm., depending on the degree of relaxation of the muscles and consequent extension of the intersegmental membranes. This also causes the length-to-width ratio to vary greatly.

Head considerably narrower than the first thoracic segment into which it is rather deeply set back. A nearly straight transverse furrow marks off the epistome from the main or posterior part of the head. The latter is produced downward and a little forward into an obtuse lobe on each side below the eyes, which have few, apparently usually about 10, well developed ocelli. The epistome forms a large rounded projecting bulbous expansion of the anterior median part of the head between the sockets of the second antennae. It is covered, like the rest of the body and head, with scattered short setae and shows

on careful examination a number of very faint transverse furrows on its anterior aspect, but these are so shallow and poorly marked as to easily escape notice altogether. The second antennae are long and stout, the flagellum is long and composed of two articles, the first being considerably the shorter. The mouth appendages form a prominently projecting mass.

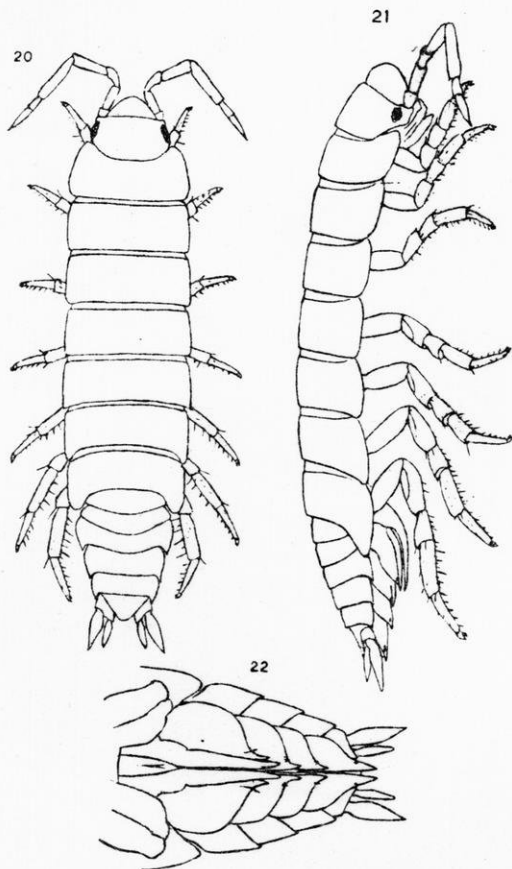


Plate XVI 20-22, *Rhyscolus latus*, sp. nov. 20, 21, dorsal and lateral views of female, $\times 16$ and 18 respectively. 22, ventral view of abdomen of female, $\times 21$.

The thoracic segments vary comparatively little in length. Their lateral ends are cut off in the arc of a large circle; only the last three have their posterior lateral angles noticeably extended backward, this occurring to a rapidly increasing degree from the fifth to the seventh. The first three have the posterior lateral angles broadly, the others quite narrowly rounded off. The portion of each segment that fits under the segment in front of it is slightly but quite abruptly lower than the rest, the change of level being marked by a noticeable

line. The legs are, in proportion to the slenderness and small actual bulk of the body, rather long and large. They are more or less setose, but their spination is rather weakly developed. The first pair are stouter than the two next pairs but exhibit no special modification. The dactylus of all the legs ends in a very minute claw on the lower side of which is a minute vesicle-like pad that is usually in a more or less collapsed condition in these specimens.

The abdominal segments except the first two have the posterior angle produced back into a small acute point. The telson is triangular with straight converging sides and a rounded tip. Excepting one very minute individual whose peculiarities are evidently due to immaturity, the specimens all have pleopoda with outlines like those shown in the figure, the first pair being long, narrow and sharply pointed, while the others all have a more or less acutely pointed median posterior angle, especially those of the fifth segment. Long, narrowly produced pleopoda are found in the males only in most terrestrial isopods, but many of these specimens are certainly females, having marsupial plates under which (usually one under each plate) eggs or embryos are carried. These plates are of squarish outline and overlap very little at the median line, hence they are not very conspicuous. I am not certain whether or not any of the specimens are males, for although some lack the marsupial plates, and differ in their somewhat smaller size and in having the first joint of the peduncle of the antennae much shorter than the second, possibly these differences are to be attributed to immaturity or sterility instead of to sexual difference. The above peculiarity of the first pleopoda and the comparatively inconspicuous marsupial plates may explain Budde-Lund's failure to recognize females (except one mutilated individual lacking the entire posterior part of the body and hence also the pleopoda) among the specimens of this genus that he examined.

Collectors' numbers of the specimens obtained:

2297—15 specimens, sifted from dead leaves, South Seymour, April 22nd, 1923.

2403— 1 specimen (female, type), under lava, Tower Island, April 27th, 1923.

2416— 1 specimen, under lava, Tower Island, April 28th, 1923.

2471— 3 specimens {

2422— 3 specimens { under lava, Tower Island, April 29th, 1923.

This form belongs to the first of the two sections into which Budde-Lund (1906, in Voeltzkow, Wiss. Ergeb. Reise in Ostafrika, II, pp. 299, 301) divides the genus *Rhyscotus*. The species comprising it are distinguished by having the telson triangular with straight (not concave) sides, the thoracic legs terminated with a very small claw beneath which is a vesicle-like pad, and the basal segment of the uropoda equal in length to the inner branch it bears. To these characters this species conforms. Budde-Lund in his synopsis enumerates four species in this section. The present one differs from *R. parallelus* from Venezuela (see Dollfus, Ann. Soc. Entom. France, LXII, p. 342, Pl. IX, figs. 6-6d) in the front of the epistome showing only very faintly indicated transverse furrowing and in the lobes of the head in front of the eyes being less acute and prominent, and from *R. ortonadae* from Equador (Budde-Lund, 1906, op. cit., p. 299, Pl. XVII, figs. 11-31) in the much less globular epistome and more

angular outlines of the body segments as seen in a lateral view. From *R. linearis* from the Comoro Islands (Budde-Lund, 1906, op. cit., p. 300, Pl. XVII, figs. 32, 33) a very incompletely described form, the present one would seem to be distinguished by the less broadly rounded lateral angles of the segments, a slightly broader telson, and by not having the setae on the borders of the segments conspicuously large, though as a matter of fact they are little longer than those scattered over the body surface. The widely separated localities are against their identity also. The fourth species of the section, *R. cubensis* (Budde-Lund, 1906, op. cit., p. 300) from Cuba, very briefly described from a single mutilated specimen comprising only the head and four body segments, is said to have the rear border of the third and fourth thoracic segments "in medio leviter incurvo," while in this species the border is straight or even very slightly convex. It therefore seems necessary to consider this form as new.

Genus *Cubaris* Brandt, 1833

Cubaris galapagoensis Miers.

Cubaris galapagoensis Miers, 1877, *Proc. Zool. Soc. London*, 1877, p. 74, pl. XII, figs. 2-2c.

Armadillo galapagoensis Budde-Lund, 1885, *Crust. Isop. Terrest.*, p. 40; 1904, *Rev. Crust. Isop. Terrest.*, pt. III, p. 108.

(Plate XVII, figs. 23-27).

This species was described by Miers from a single specimen 11 mm. long, collected in 1875 at Charles Island by the expedition under Commander W. E. Cookson. The present collection contains also only a single specimen, a male, considerably smaller than the original one, though in its rolled up condition it cannot be accurately measured. Miers' description being brief, and in some respects vague, the following details are given here.

Body seen from above oblong, narrowly rounded behind; in front the outline of the head forms a curve only gently arched. Body hard and compactly articulated; its surface minutely granular under magnification and raised also into rounded and elongate tubercles arranged with some regularity. These form a well defined transverse row along, though a little removed from, the posterior margin of each thoracic segment. In each of these transverse rows about six of these tubercles occupying the median region are small and rounded, those in the dorso-lateral parts (about four on each side) are larger and more elongate; at the junction of the main and epimeral portion of the segment there is a single somewhat elongate one, and on each epimeron a single obliquely placed one. A few smaller, less well defined tubercles occur in front of this row on the median portion of each segment, and on the first segment, which is much longer than the others, there are additional elongate ones and a pair of exceedingly large ones close together, one each side of the median line on the anterior part of the segment. The forehead bears a number of small tubercles. The surface of the abdomen is practically smooth except for a tubercle on each epimeron of the third, fourth and fifth segment, a pair on the anterior part of the telson, with a poorly defined one somewhat asymmetrically placed behind or below this pair. Whether this represents a somewhat misplaced median

tubercle or one of a pair the other of which is not developed, I do not know. The specimen cannot be straightened out without danger of breaking it, but would probably not much exceed 6 mm. in length. The color in alcohol is rather dark gray above with the margins of the segments and the tubercles

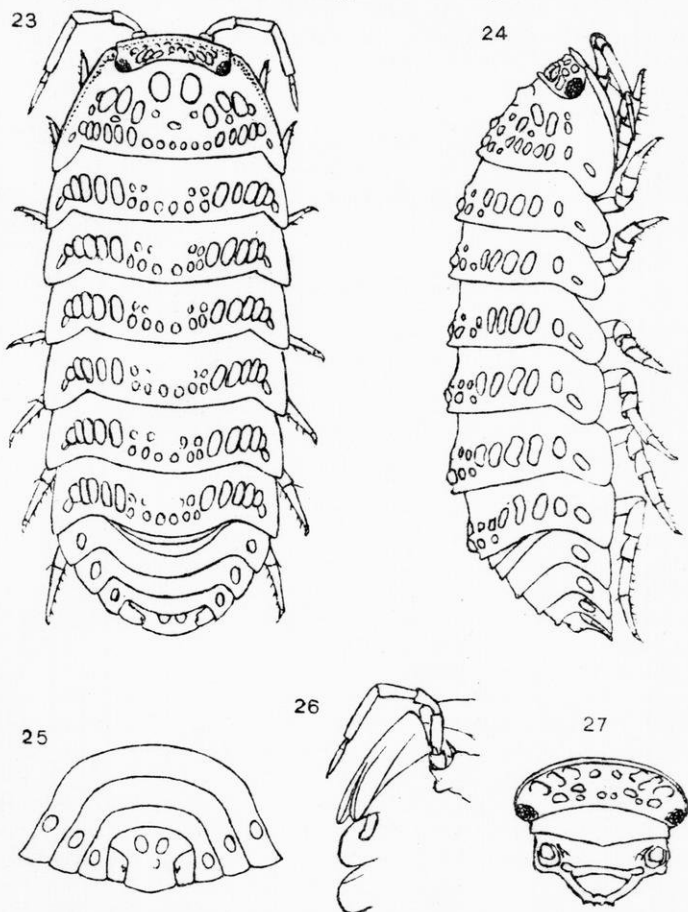


Plate XVII. 23-27. *Cubaris galapagoensis* Miers, 1877. 23, 24, dorsal and lateral views of male, $\times 14$. 25, rear end of body, $\times 19$. 26, ventral side of anterior segments, $\times 15.5$. 27, front view of head, $\times 17.5$.

light grayish or brownish white (unpigmented), as are also the legs and most of the under parts. Head only moderately wide, eyes small with about 15 ocelli. Upper edge of epistome gently arched when seen in an anterior view, and forming a narrow projecting border clear across the head. Antennae of moderate length and quite slender; the flagellum is slender, shorter than the last joint of the peduncle, and consists of two articles, the basal one about one-third the length of the second or terminal one.

Thoracic segments having their exposed part noticeably (but not very abruptly) raised above the part fitting under the next segment in front, and the rear border forming a somewhat prominent ridge. Their rear lateral angles are considerably produced backward, and except the last three, conspicuously rounded in outline. The first segment has the lateral border curved as seen in a side view, and its anterior two-thirds are rolled outward to form a prominent but not very thick projecting margin. No distinctly defined groove marks this off from the lateral face of the segment. The rear lateral angles have a small nearly equal-sided cleft to receive the second segment when the body rolls up; this is not continued forward into a perceptible sulcus on the underside of the rolled out margin except for a short distance. The second segment bears a small, short, rather bluntly pointed coxopodite process between which and the inner face of the epimeron the inner division of the cleft rear angle of the first segment fits when the body rolls up. The third segment merely has the anterior border of the epimeron thickened, but bears no process. The legs are only moderately long, rather weak and not very spiny. The abdomen has the lateral ends of the segments squarely truncated and slightly flared outward. The telson is somewhat broader than long in its upper portion; its terminal border, which is somewhat convex, projects a trifle beyond the outline formed by the other abdominal segments and is nearly two-thirds the width of the upper part. The middle portion is a little constricted. The exposed parts of the basal joints of the uropoda are longer than wide. Their inner branches (seen only in a ventral view) are exceedingly short; the outer branches are reduced to minute rudiments, short and thick, each borne on a small tubercle close to the inner margin of the outer face of the basal joint, some distance from the rear margin.

The specimen was found under a stone on Eden Island.

***Cubaris beebei*, sp. nov.**

(Plate XVIII, figs. 28-30).

Body oblong when seen from above, the front outline of the head and first segment, and that of the abdominal segments and uropoda, forming broadly rounded curves in front and behind. Back highly arched, its surface without any coarse tuberculation (though very slightly uneven in the dorso-lateral regions), but under considerable magnification it exhibits evenly, though not very thickly distributed scabrous punctations. Color gray-brown above with the usual light markings; legs and under parts not pigmented. Length of the largest specimens, which are perhaps not fully grown, about 5 to 6 mm.

The exposed part of each thoracic segment is somewhat elevated (though not abruptly so) above the part overlapped by the segment next in front. Their posterior lateral angles are but little extended backward, those of the first three or four are rounded; the other segments become successively more squarely truncated proceeding toward the rear.

Upper margin of the epistome only very gently arched and turned up to form a very narrow but distinct projecting border clear across the front of the head. This border is separated from the forehead by a very narrow impressed groove or furrow. Eyes rather small, with about 12 ocelli. Second antennae rather short and small, their flagellum is two-jointed; the basal joint is only about one-third that of the terminal one in length.

Lateral border of first thoracic segment turned obliquely up (rather widely in front, the reflected part diminishing to nothing as the rounded rear angle of the segment is approached) so as to form between itself and the surface of the main part of the segment a narrow shallow groove. Posterior lateral corner of the first segment with a small cleft, but this is not extended forward as an appreciable sulcus on the inferior aspect of the margin except for an insignificant

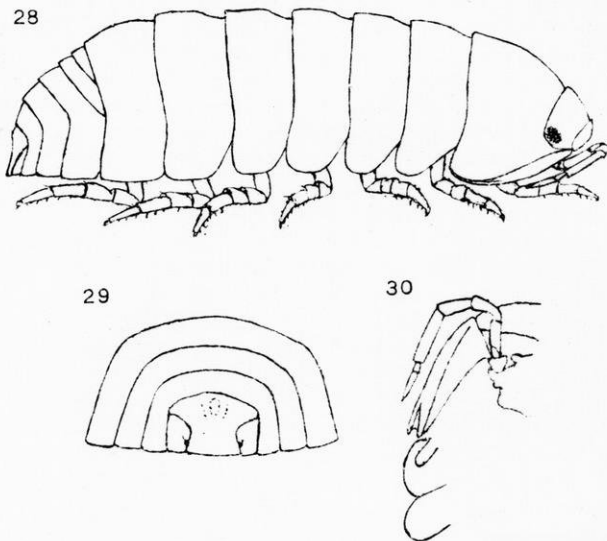


Plate XVIII. 28-30, *Cubaris heebii*, sp. nov. 28, side view of female. $\times 15.5$. 29, rear end of body. $\times 20$. 30, ventral side of anterior segments. $\times 17.5$.

distance. The epimeron of the second segment bears on its inner aspect a small coxopodite process ending in a flattened bluntly rounded tip. No processes on the third segment. Legs rather small and weak, their spines rather few and small.

Lateral ends of the third to fifth abdominal segments truncated and forming a smooth continuous outline with the basal segments of the uropoda and telson. They are not noticeably bent or flared outward.

Telson broader than long by nearly one-fourth and considerably constricted in the middle; the truncated rear end is about two-thirds the width of the upper part. On the middle line near the upper end there is an elongate depression or shallow pit with a slight elevation on either side.

Basal segments of uropoda a little longer than wide. Their inner branches, visible only from below, are very short and rather wide; the outer branches are reduced to very small rudiments borne close to the inner margin (that next to the telson) of the basal joint, some distance from the rear end.

Eight specimens, representing individuals of both sexes, are in the collection. Three of them have the collector's number 2297 and were taken in siftings of dead leaves on South Seymour, April 22nd, 1923. The others (including the type) are labeled "Under stones, Eden." One of the largest females has been selected as the type.

This species is very closely related to several of those already described from the warmer parts of America, but most closely of all to *C. grenadensis* (Budde-Lund), 1893, Entomol. Meddel., ann. 1893, p. 115, from Grenada, W. I., also described briefly and somewhat crudely figured by Dollfus, 1896 (Proc. Zool. Soc. London, ann. 1896, p. 392, figs. 5a-5d), who records it from two additional islands (Becquia and Balthazar) of the West Indies. I cannot however regard the two forms as identical.

In *C. grenadensis* the sulcus on the inferior margin of the first segment is considerably better developed, reaching half the length of the border before fading out, the body surface is "minutissime et densissime reticulate punctata" according to Budde-Lund, which would hardly be correctly applied to the rather scattered scabrous punctations of the Galapagos form; the upper margin of the epistome is described as "in medio levissime, vix memorabiliter reflexo," while in the Galapagos specimens it is nearly as much reflected at the center as at the sides and has a decidedly more convex outline as seen from above or below than the figures of Dollfus indicate is the case in the West Indian species. His figure also shows the inner branch of the uropoda much longer and narrower than in the present specimens, and the size is much larger (14 mm. long) according to Dollfus. From another closely related species, *C. dugesi* (Dollfus), 1896, from Mexico, the form of the telson serves as a distinguishing character, as in that form it is as long as wide. *C. pisum* (Budde-Lund), 1885, from Florida, is distinguished by its much longer antennae and moreover has the minute outer branch situated near the end ("apice propius") of the basal joint of the uropod. *C. dumorum* (Dollfus), 1896, from Mustique Island, W. I., has the coxopodite process of the second segment large and square. *C. vincentis* (Budde-Lund) syn. *C. cincta*, *C. perlata* and *C. silvarum*, all described by Dollfus (1896) from the West Indies, as well as *C. galapagoensis* Miers, 1877, redescribed above in this paper, are all near allies of the present form, but distinguished either by the tuberculation of the body surface or by the much greater length of the sulcus on the margin of the first segment of the thorax (in the case of *C. perlata* by both these characters).

Family LIGYDIDAE

Genus *Ligyda* Rafinesque, 1814 (= *Ligia* auct. plur.)

Ligyda baudiniana (Milne-Edwards).

Ligia baudiana Ives, 1891, Proc. Acad. Nat. Sci. Philadelphia, p. 185, pl. VI, fig. 2.

Ligia baudiniana Milne-Edwards, 1840, Hist. Nat. Crust., III, p. 155; Saussure, 1858, Mem. Soc. Phys. Hist. Nat. Genève, XIV, p. 476; Stuxberg, 1875, Öfvers. K. Svensks. Vetensk.-Acad. Forh., XXXII, No. 2, pp. 43, 46, 48; Ives, 1891, Proc. Acad. Nat. Sci. Philadelphia, pp. 199, 200; Richardson, 1901, Proc. U. S. Nat. Mus., XXIII, p. 574; 1902, Trans. Connecticut Acad. Sci., XI, p. 306, pl. XL, fig. 61; 1904, Proc. U. S. Nat. Mus., XXVII, pp. 24, 30; Chilton, 1916, Mem. Indian Mus. Calcutta, V, pp. 464, 466, 472, 473; Jackson, 1922, Proc. Zool. Soc. London, pp. 689, 698, pl. II, figs. 17, 18.

Ligia exotica (not Roux, 1828) + *L. exotica* var. *hirtitarsis* Dollfus, 1890, Bull. Soc. Études Sci. Paris, XII, p. 7, figs. 5, 6.

Ligia hirtitarsis Dahl, 1892, Ergeb. Plankton-Exped., I, pt. 1, p. 111, pl. III, figs. 1, 6, 7, 11, 12.

Ligia gracilis Moore, 1902, *Rept. U. S. Comm. Fisheries*, XX, part 2, p. 175, pl. XI, figs. 7-12.

Ligyda baudiniana Richardson, 1905. *Bull.* 54, U. S. Nat. Mus., p. 678, figs. 71-723.

The following references appear to apply to this species more or less doubtfully:

Ligia baudiana Miers, 1877, *Proc. Zool. Soc. London*, pp. 670, 671.

Ligia baudiniana Bate, 1868, *Ann. Mag. Nat. Hist.* (4) 1, pp. 443, 446.

(Plate XIX, figs. 31-36).

The Galapagos collection contains specimens which I am unable to separate specifically from this species inhabiting the West Indian region and Atlantic coast of America from Florida to Rio Janeiro, although not reported on the Pacific side. The largest specimen (fig. 31) from the Galapagos has more elongate antennae, which reach to or beyond the end of the body, and longer uropoda than are credited to this species in the descriptions except in the somewhat doubtful one of Miers, 1877, (which may refer to another species, *L. exotica* Roux, 1828), but few museum specimens have these parts (especially the uropoda) attached and complete, so that we actually have very little information as to how long these parts normally become in *L. baudiniana*, although the specimens available show that there is considerable variation individually and with age. Under these circumstances I cannot base a specific distinction on this character.

In its general form and character this species resembles the well known and widely distributed *L. exotica* (Roux), 1828, but is distinguished by its smaller size, somewhat wider head and more elongate eyes, its obtusely ending telson, the more complete fusion of the epimera with the main portion of the thoracic segments, and especially by the first legs of the male, which lack the small lateral process at the distal end of the propodus that is present in *L. exotica* but have the merus and carpus flattened and provided on the thin inferior borders with a single row of short, close-set spiny hairs. These joints are also provided with a file-like area of fine, parallel, obliquely transverse ridges and furrows on their anterior aspect. The second and third legs have the corpus swollen and provided with a narrow file-like area, but the fringe of spiny hairs is present only on the first pair. In the female the three anterior legs are similar to the fourth and the more posterior pairs which are alike in both sexes.

Some other particulars not shown in the accompanying figures are as follows:

The body surface is covered with scattered, very small, low tubercles; slightly larger ones form a row along the rear edge of the segments. The color is greenish gray, due to minute, thickly but unevenly scattered, irregularly stellate pigment spots.

The largest male and female (13.5 and nearly 12 mm. long respectively) have antennae reaching beyond the end of the body when drawn back and having 43 or 44 articles in the flagellum. The smaller specimens have the antennae proportionately much shorter (not reaching much beyond the end of the thorax) and with fewer articles (sometimes less than 30). The uropoda were lost except in two specimens. In the large male they are long, the basal

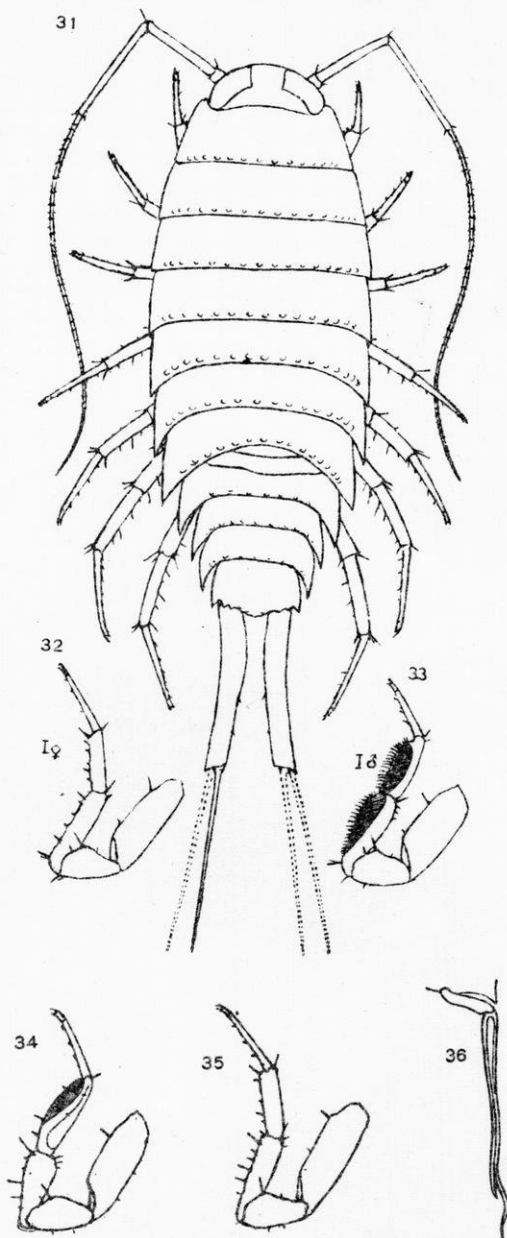


Plate XIX. 31-36, *Ligya baudintana* (Milne-Edwards), 1840. 31, dorsal view of female, $\times 6.4$. 32, first leg of female $\times 8.4$. 33, first leg of male $\times 7.2$. 34, second leg of male $\times 7.2$. 35, second leg of female $\times 8.4$. 36, styloid process of right second pleopod of male, ventral view, $\times 12$.

joint almost equaling the exposed part of the abdomen measured on the median dorsal line, and the inner branch (the outer is missing in both cases) considerably exceeding the basal joint in length. In one of the smaller specimens the uropoda are, however, proportionately much shorter. I have compared the stylets of the second pleopoda in males of the Galapagos and West Indian specimens and find them closely similar, but they are very different from those of *L. exotica*, which have the ends enlarged and rounded. In *L. baudiniana* the organ tapers to a not very acute tip which is twisted slightly inward toward the median line. The ventral surface bears a shallow groove along the entire length of the stylet. This groove has its outer margin more prominent than the inner. From a small cleft on the dorsal surface near the distal end, a tapering flexible fleshy process of varying length protrudes.

Six specimens are in the Galapagos collection. Collector's numbers:

2471—3 small specimens (not adult).

2232—1 male.

2416—1 female.

These were all taken under lava blocks on Tower Island, in April, 1923.

Conway Bay, Indefatigable Island, April 1, 1923. One male (largest specimen).

This is one of the series of scientific papers of the Harrison Williams Galapagos Expedition, under the directorship of William Beebe, sent out by the Department of Tropical Research of the New York Zoological Society. The general account and narrative of the expedition, together with the natural history and photographs of the fauna, are embodied in a volume by William Beebe, published by G. P. Putnam's Sons, under the auspices of the Zoological Society. Its title is "Galapagos; World's End."

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