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Terrestrial Isopods of Southeastern Polynesia[1]

By **HAROLD GORDON JACKSON**

BIRKBECK COLLEGE, UNIVERSITY OF LONDON

INTRODUCTION

This paper is the result of study of the terrestrial Isopoda collected by the Mangarevan Expedition in 1934. The islands included in the collection, with the exception of Tahiti, have never before yielded isopod specimens for investigation. In spite of assiduous collecting (133 tubes) the actual number of records is small, but, as might be expected, the proportion of new forms is very high. Of the 24 records, eleven are genera, species, or varieties new to science, and all but one are new for the localities. The type specimens of all new species are stored in Bishop Museum. The following list includes all the forms found:

1. Ligia vitiensis Dana
2. L. philoscoides, new species
3. L. rugosa, new species
4. L. pallida, new species
5. Trichoniscus thomsoni Chilton
6. Philoscia (Setaphora) truncata Dollfus
7. P. fasciata Jackson
8. P. (Paraphiloscia) gracilis var. australis, new variety
9. P. persona, new species
10. P. squamosa, new species
11. P. squamosa var. setosa, new variety
12. Alloniscus oahuensis Budde-Lund
13. Cerberoides (Philoscodillo) pilosus, new genus, subgenus and species
14. C. (Oniscomorphus) bicornis, new genus, subgenus and species
15. C. (Conglobonisicus) brevicauda, new genus, subgenus and species
16. Porcellio (Mesoporcellio) laevis Latreille
17. P. scaber Latreille
18. P. (Heminagara) tahitiensis Jackson

[1] Mangarevan Expedition Publication 26.

19. P. (Porcellionides) pruinosus Brandt
20. Spherillo (Spherillo) testudinalis Budde-Lund
21. S. (Spherillo) montivagus Budde-Lund
22. S. (Xestodillo) marquesarum Jackson
23. S. (Xestodillo) marquesarum var. australis, new variety
24. Cubaris murinus Brandt

In the following pages, the names of the Expedition's collectors will be indicated by initial letters thus: Donald Anderson (DA), W. G. Anderson (WA), C. M. Cooke, Jr. (C), F. R. Fosberg (F), Harold St. John (J), Yoshio Kondo (K), S. C. Wight (W), and E. C. Zimmerman (Z).

I wish to express my indebtedness to Dr. Vera Fretter for the assistance she has given in a preliminary investigation of the material and for several admirable drawings, and to Miss Clara Vincent for preparing the manuscript for publication.

DISTRIBUTION

The most interesting feature of the spread of the recorded species is the distribution of the new forms; no fewer than ten come from the Austral Islands. New forms are marked with an asterisk.

Mangareva Islands
- Ligia vitiensis
- *L. rugosa
- Philoscia truncata
- P. fasciata
- Alloniscus oahuensis
- Porcellio laevis
- P. (Heminagara) tahitiensis
- Spherillo montivagus
- S. testudinalis
- S. marquesarum
- Cubaris murinus

Henderson Island
- Philoscia truncata
- P. fasciata
- Spherillo montivagus
- S. marquesarum

Pitcairn Island
- Philoscia fasciata
- Spherillo montivagus
- S. marquesarum

Austral Islands

Maria
- Porcellio (Heminagara) tahitiensis

Rimatara
- Spherillo testudinalis
- S. marquesarum

Rurutu
Philoscia fasciata
*P. gracilis var. australis
Spherillo marquesarum
*S. marquesarum var. australis
Tubuai
Philoscia truncata
P. fasciata
*P. gracilis var. australis
Alloniscus oahuensis
Porcellio (Heminagara) tahitiensis
*Spherillo marquesarum var. australis
S. testudinalis
S. montivagus
Raivavae
Philoscia fasciata
Alloniscus oahuensis
Spherillo montivagus
S. testudinalis
S. marquesarum
*S. marquesarum var. australis
Cubaris murinus
Marotiri
*Ligia rugosa
*Philoscia persona
*P. squamosa
*P. squamosa var. setosa
Rapa
*Ligia philoscoides
Trichoniscus (Megatrichoniscus) thomsoni
Philoscia fasciata
*Cerberoides (Philoscodillo) pilosus
*C. (Oniscomorphus) bicornis
*C. (Conglobóniscus) brevicauda
Porcellio scaber
Spherillo montivagus
S. marquesarum
Cubaris murinus
Society Islands
Tahiti
Philoscia truncata
P. fasciata
Alloniscus oahuensis
Spherillo testudinalis
S. marquesarum
Cubaris murinus
Moorea
Philoscia truncata
P. fasciata
Spherillo testudinalis
S. marquesarum
Cubaris murinus

Huahine
Philoscia truncata
Raiatea
Philoscia truncata
Porcellio (Heminagara) tahitiensis
Spherillo testudinalis
Cubaris murinus
Tahaa
Spherillo testudinalis
Meetia
Spherillo testudinalis
Fanning Island
Alloniscus oahuensis
Porcellionides pruinosus
Cubaris murinus
Christmas Island
*Ligia pallida
Porcellio (Heminagara) tahitiensis(?)

With this collection a cursory survey of most of the important groups of islands in eastern Polynesia has been made, but it is probable that much relating to the distribution of terrestrial isopods remains to be found. In particular, data is lacking for the Cook Islands and Tonga in the Polynesian area and for Fiji. Exploration of Micronesia has scarcely begun.

The present collection adds much to our information, and it is interesting to note that, although some widely distributed species seem to recur frequently, none is found in more than nine of the twenty islands from which collections were made. On the other hand, *Spherillo marquesarum,* described for the first time from the Marquesas (5)[2], turned up in ten of these islands. Species which occur in any Pacific collection are *Spherillo testudinalis* (9 records), *S. montivagus* (6 records), *Cubaris murinus* (7 records), *Philoscia (Setaphora) truncata* (7 records), and *Alloniscus oahuensis* (5 records), but the ubiquitous *Porcellio laevis* (1 record) and *Porcellionides pruinosus* (1 record) have scarcely penetrated here.

Two species described first from the Marquesas (5) and Society Islands (4) respectively have a wider distribution, *Philoscia fasciata* occurring nine times and *Heminagara tahitiensis* five. The only remaining new species from the Marquesas, the grotesque spiny *Echi-*

[2] Numbers in parentheses refer to Literature Cited, p. 192.

nodillo montanus and *Tridentodillo squamosus,* were not found in this collection.

There would seem no logical inference to be drawn from the fact that all the new species were found in the Austral Islands, nor any reason why most of this creative energy should be centered on Rapa and Marotiri Islands with four new species apiece, unless it be that the Austral Islands are less frequently visited than other Polynesian islands. The isopods from Rapa are particularly notable for individuality. It is peculiar that in this collection the common European *Porcellio scaber* is recorded only from Rapa and that it was collected there no less than thirteen times. It is otherwise recorded in the Pacific from the Hawaiian islands, New Zealand, Juan Fernandez, and the Galapagos Islands. It is to be hoped that the author of this unconscious introduction has not, in satisfying his desire for European horticulture, sealed the doom of the indigenous isopod fauna of this particularly interesting island. The presence of *Porcellio scaber* serves, however, to emphasize the urgency of studying the fauna of the Pacific islands before the picture is further distorted. Another interesting record from Rapa is that of *Trichoniscus thomsoni,* the first endemic New Zealand form to be recorded elsewhere in Polynesia.

A survey of the recorded species will make it clear that southeastern Polynesia has no affinity with Hawaii or America and less than might be anticipated with Australia and New Zealand.

The only form which must be attributed to America, if the identification of the single specimen is correct, is *Rhyscotus ortonedae* Budde-Lund (or *R. laxus* Van Name) from Samoa (3); the only form in common with Hawaii is *Ligia perkinsi* Dollfus which is also recorded from Samoa (3).

Of the typical New Zealand species, *Ligia novae-zealandiae* Dana is unrecorded from this region and no species of *Tylos, Scyphax, Deto, Scyphoniscus* or *Actaecia* have been found; but, as pointed out above, most of the widely distributed species find their nearest relatives to the west and seem to have spread from a northwesterly direction.[3]

The lack of records for any species of *Trichoniscus* other than

[3] The question of the geographical distribution of the terrestrial isopods of the Pacific islands is fully discussed in my "Check list of the terrestrial and freshwater isopods of Oceania" now in course of publication.

T. thomsoni is probably due to their minute size and inconspicuousness rather than to their actual absence.

LIGIIDAE

Ligia vitiensis Dana.

Mangareva Islands: Mangareva, north of Rikitea, at sea level, May 30, 1934 (F).

It is not surprising that this species should be found in the Mangareva Islands, as it has already been recorded from New Guinea, Fiji, and the Marquesas. As I have pointed out (5, p. 149), it is undoubtedly distinct from *L. hawaiensis*.

Ligia rugosa, new species (figs. 1, *a-c*; 2, *c-d*).

Length, male 11.5 mm., female (ovigerous) 10.5 mm.; breadth, male 4.5 mm., female 5.5 mm.

Shape, elongate oval. Surface, scabrous. Color, in alcohol, dark slaty gray.

Head. Of "oceanica" type. Eyes moderately large, separated by nearly twice their breadth. Supra antennal line with pronounced V in midline. Upper border of clypeus nearly transverse.

Thorax. Hind border of first three tergites almost straight, remainder increasingly curved but postero-lateral angles never long. Coxal plates separate on 2, 3, 4, and 5 tergites on ovigerous female (indistinct on other females), not visible on male.

Abdomen. Slightly contracted; postero-lateral angles little drawn out. Telson, hind border almost arcuate with faint indication of median angle; no lateral angles and only slight undulations in place of accessory processes; about twice as broad as long.

Appendages. Antenna very long, reaching to third or fourth abdominal somite (in the ovigerous female longer than whole body), flagellum 21-22 articulations, fifth segment about one third longer than fourth. Mandibles: both with few penicilli. Maxillula: outer endite, all simple, but single feathery plume present; inner endite, penicilli very unequal, two proximal long and slender, distal very small, distant from others and mounted on separate terminal setose segment. Maxilla without penicilli. Maxillipede; endite, setose tip, only two stout spines, one on inner edge and one on face, near to inner spine a short brush; endopod expanded on inner edge. Uropod: protopod with small outer tooth; exopod very slender, shorter than endopod; endopod moderately stout and tipped with very long bristle; whole uropod at least one third whole length of body. First peraeopod of male without tooth on propos.

Mangareva Islands: Mangareva, north of Rikitea, at sea level, May 30, 1934 (F).

Austral Islands: Marotiri, southeastern islet, July 22, 1934 (Z, F).

This species differs from all others in the form of the telson, which is entirely without processes. The mouthparts are also sharply

distinct, especially the inner endite of the maxillula and the endite of the maxillipede. Few species have the markedly granulate surface of this one.

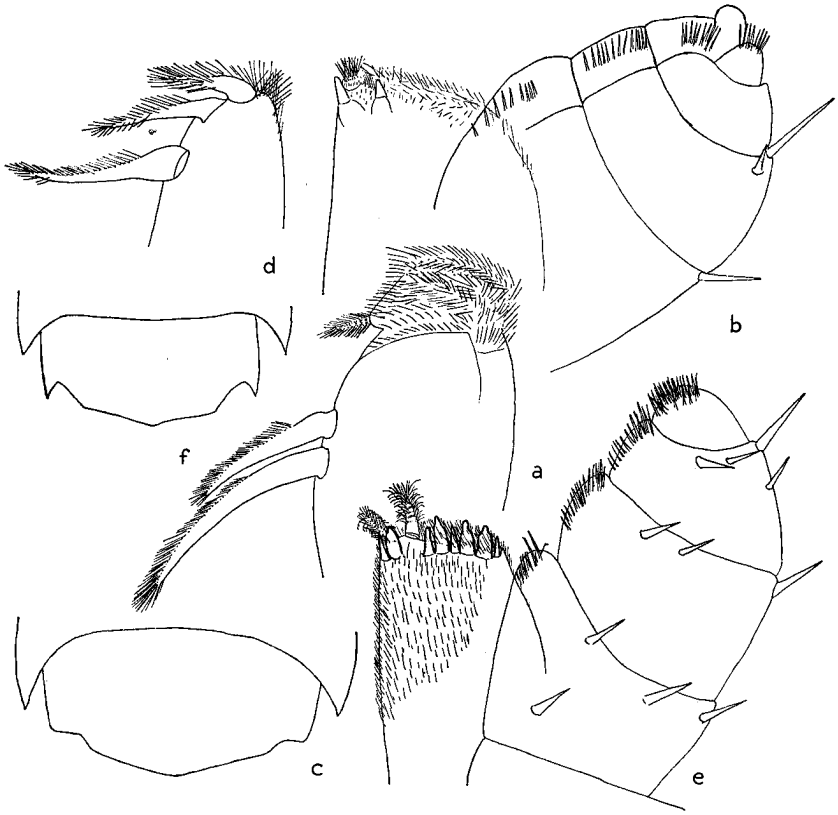

FIGURE 1.—*Ligia rugosa,* new species: *a,* maxillula, inner endite; *b,* maxillipede; *c,* telson. *Ligia pallida,* new species: *d,* maxillula, inner endite; *e,* maxillipede; *f,* telson.

Ligia philoscoides, new species (fig. 2, *a-b*).

Length, male 7.5 mm.; female 9.5 mm.; breadth, male 3.5 mm., female 4.75 mm.

Shape, elongate oval. Surface, very smooth and shining. Color, in alcohol, heavily pigmented, a mottled grayish brown.

Head. Eyes large, separated by little more than their breadth. Antennary tubercle well marked and flattened, distinct margin on which supra-antennary line runs. Frontal line dips down in front of eye and joins antennary tubercle. Supra-antennary line nearly linear in midline, not forming V. Frontal lamina a tumid roll. Clypeus nearly transverse.

Thorax. Hind border of first three tergites transverse, remainder progressively curved, postero-lateral angles little drawn out. Coxal plates very faintly separated in both sexes and almost obsolescent in male.

Abdomen. Slightly contracted, postero-lateral angles little drawn out. Telson without postero-lateral angles or accessory processes; hind border very bluntly triangulate. About one and a half times as broad as long. Indistinct transverse groove between insertions of uropods.

Appendages. Antenna very long and slender reaching to hind border of last abdominal somite in both sexes; flagellum 23 articulations; fifth segment slightly longer than third.

Mouthparts similar to *L. rugosa* but inner endite of maxillula has the following differences: the penicilli are progressively smaller from proximal to distal, the most distal is very heavily setose giving it a multi-articulate appearance and is larger than the corresponding one in *L. rugosa*. Uropod: a detached appendage very slender, base has tooth and is about two thirds the length of the rami. Peraeopoda, very slender; first of male without tooth on propos.

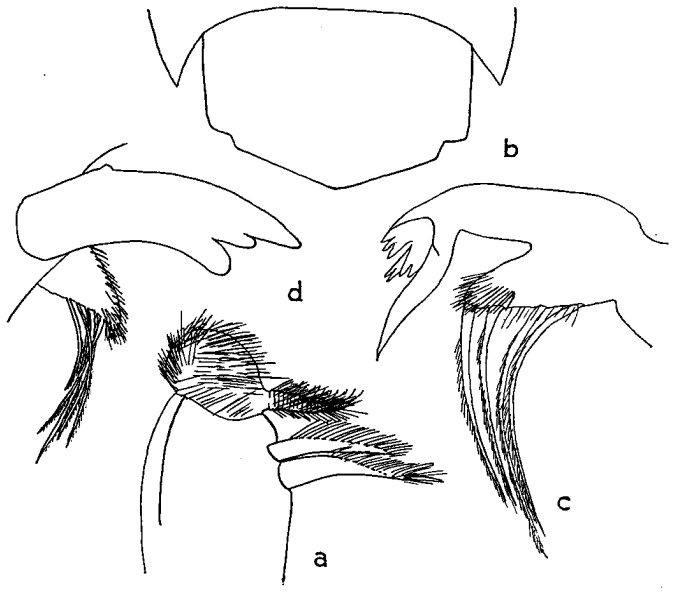

FIGURE 2.—*Ligia philoscoides*, new species: *a*, maxillula, inner endite; *b*, telson. *Ligia rugosa*: *c*, right mandible; *d*, left mandible. (Omitting incisor and molar parts.)

Rapa: above Area, alt. 378 ft., under stones, July 1, 1934 (F); Mount Perahu, east ridge, alt. 1,400-1,600 ft., July 28, 1934 (Z); Karapo Rahi Islet, alt. 100-300 ft., July 18, 1934 (Z).

This terrestrial form is closely related to the littoral *L. rugosa*, from which it differs in its surface, the minute structure of the head,

the maxillula and other slight features. Three species of terrestrial *Ligia* have been described, but this is another instance of the tendency of members of the genus to attempt to establish themselves far from the seashore. It is a much smaller species than *L. perkinsi,* which has been recorded from Samoa, and differs from it in antenna, mouthparts, and telson.

Ligia pallida, new species (fig. 1, *d-f*).

Length, male 13.5 mm., female 8.5 mm.; breadth, male 5 mm., female 3.5 mm.

Shape, elongate oval. Surface smooth, rather shining, very minutely scaly, almost devoid of undulations. Color, in alcohol, cream, with diffuse chromatophores dotted sparsely over surface.

Head. Of "oceanica" type. Eyes moderately large and separated by their width. Clypeus upper border slightly curved.

Thorax. Hind border of first three tergites straight, remainder progressively drawn out; postero-lateral angles moderately produced. Coxal plates not separated in male, very faint in female.

Abdomen. Not abruptly contracted. Telson, postero-lateral angles prominent, accessory processes blunt, posterior border very bluntly triangulate. More than twice as broad as long.

Appendages. Antenna short and stout. In male scarcely reaches hind border of sixth tergite, in female just beyond fourth. In male, flagellum has 25 and in female 20 stout short articulations.

Mandibles, both with few penicilli. Maxillula: outer endite, four inner teeth ctenate, remainder simple; inner endite, proximal penicilla very long, two distal about one third proximal and equal, distal end setose. Maxilla without penicilli and very setose. Maxillipede: endite with four bottle-shaped and four sharp, flat spines on distal edge of ventral face and two stout, brush penicilli; setose. Peraeopoda. Propos of first leg of male with tooth; carpos and meros with concave, transversely ridged surfaces on lower side. Uropod missing.

Christmas Island: around edge of drying salt pool under dry pieces of gelatinous algae, Oct. 22, 1934 (F).

The telson of this form resembles that of *L. australiensis* Dana, but the surface is smooth and not granulate and Dana's specimen was too incomplete to make further comparison possible. The short antennae, color, telson, and other characters separate this species from all others.[4]

[4] In his paper on the Isopoda of New Caledonia (6), Verhoeff subdivides the genus *Ligia* Fabricius into five genera and gives further characters for three of them in a later paper (7). The characters used are so detailed that it is doubtful whether any but the genotypes will conform to them. The subdivisions are not based on a complete survey of the group nor do they seem to me to have more than subgeneric value. None of the species described above can be placed in Verhoeff's subdivisions. By amending Verhoeff's definitions, *Ligia rugosa* and *Ligia philoscoides* might be forced into his "Ligia" and *Ligia pallida* into "Megaligia", but I prefer to leave them in *Ligia* Fabricius pending a critical analysis of the whole genus.

TRICHONISCIDAE

Subgenus **MEGATRICHONISCUS,** new subgenus

With general characters of *Trichoniscus,* but body is broad oval in shape and the tergites are hard, shiny, and well calcified. The lateral plates of the first tergite are large and nearly enclose the head so that the front appears broad and rounded. Antennary tubercles not strongly developed. Eyes with three widely separated ocelli. Antennal flagellum of five or more segments. Epimera relatively well developed. Abdomen abruptly contracted.

This subgenus is created to contain Chilton's species *Trichoniscus thomsoni* (1886), two specimens of which have been found on Rapa Island. *Trichoniscus magellanicus* (Dana) also should come under this subgenus and possibly, though more doubtfully, *Trichoniscus murrayi* Dollfus. These are giants among trichoniscids and have the superficial appearance of a *Porcellio* or *Philoscia,* very unlike the minute, slender, delicate-bodied forms which make up the majority of this family.

Trichoniscus (Megatrichoniscus) thomsoni (Chilton), (fig. 3).

Philygria thomsoni Chilton; New Zealand Inst., Trans., **18**, 1886.

Trichoniscus thomsoni (Chilton): Linn. Soc. Zool., Jour., **8**, 1901; Wahrberg, Arkiv. für Zool., **15**, 1922; Stephenson, Vidensh. Meddel. Dansk. Nat. Foren., **83**, 1927.

The following points may be added to Chilton's description:

Color, a uniform chocolate brown, except for light muscle markings on middle of thorax and top of head. Profrons uniform brown.

Head. Eyes: three large ocelli, two lateral ones at each end of sausage-shaped roll. Supra-antennal line very well marked, dipping very deeply between antennary sockets. Lateral process of clypeus styliform.

Thorax. Coxal plates distinct on 2 and 3, less so on 4 (female specimen).

Abdomen. Abruptly contracted, angles adpressed but visible from above. Flattened dorso-ventrally. Telson truncate. Base of uropod exceeds telson; exopod long and styliform; endopod reaches halfway up exopod and set but little proximal to it on base.

Rapa: east base of Mount Perahu, alt. 100-300 ft., July 21, 1934 (Z); east ridge of Mount Perahu, alt. 1,200-1,500 ft., July 21, 1934 (Z).

Also occurs on Auckland Islands, New Zealand, and Jarrahdale, Western Australia.

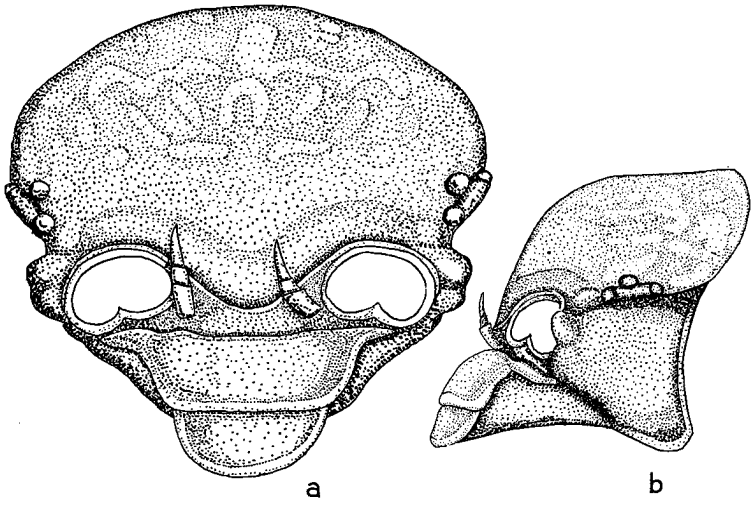

FIGURE 3.—*Trichoniscus* (*Megatrichoniscus*) *thomsoni*: *a*, head from front; *b*, head from side.

ONISCIDAE

SUBFAMILY ONISCINAE

Philoscia (Setaphora) truncata Dollfus.

Mangareva Islands: Mangareva, Rikitea, May 27, 1934 (F).

Henderson Island, alt. 5 ft., in base of *Asplenium nidus*, June 21, 1934 (F).

Austral Islands: Tubuai, Mount Taitaa, alt. 1,000 ft., Aug. 15, 1934 (Z); west of Mataura, Aug. 23, 1934 (C).

Rapa: southeast valley, Mount Ororangi, alt. 600-700 ft., July 3, 1934 (Z); top, Mount Ororangi, July 6, 1934 (F); Mount Perahu, north ridge, 2,050 ft., under dead leaves, July 28, 1934 (F).

Society Islands: Tahiti, Papeari, Nr. Vaitaare, March 24, 1934 (Z); Papenoo Valley, alt. 1,500 ft., under stones and in moss, Sept. 16, 1934 (F). Moorea, Mount Teaharoa, north slope, 1,500-2,000 ft., Sept. 25, 1934 (Z). Huahine, Mount Turi, northwest ridge, 1,700-2,100 ft., Oct. 1, 1934 (Z). Raiatea, Faaroa Bay, northwest ridge, 300-500 ft., Oct. 6, 1934 (Z).

Philoscia (Paraphiloscia) gracilis var. **australis,** new variety (fig. 5, *d*).

Paraphiloscia gracilis (B. L.) Jackson: Insects of Samoa, **8** (1): 8, 1927.

This species has been recorded from Samoa (which is the type locality), and the specimens collected from Tubuai in the Austral Islands—Mount Taitaa, alt. 1,000 ft., Aug. 19, 1934 (C), and from the southwest ridge of Mount Taitaa, Aug. 20, 1934, at 1,200 ft. (Z) —resemble the Samoan species so closely that it does not seem justifiable to create a separate species for them.

The points of difference upon which this variety is founded are as follows: the flagellum is slightly shorter than the fifth segment of the antenna, the articles of the flagellum are equal; the telson is triangulate but not so sharp as in *P. gracilis,* the angle being distinctly blunt. The color is brown, evenly mottled, with the midline sometimes with a median stripe; the fifth somite is not darker than the others. In mouthparts and all other characters these specimens agree with *P. gracilis.*

Philoscia persona, new species (fig. 4).

Length, male 6 mm., female 5.5 mm.; breadth, male 2.5 mm., female 2.25 mm.

Shape, elongate oval. Surface, moderately smooth and shiny; minutely pitted, like orange skin. Color, in alcohol, tergites 1, middle of 2 and 5 cream, remainder purple brown. Head with dark profrons contrasting sharply with yellow vertex and postfrons, giving a masklike appearance to the face. Antenna dark brown.

Head discrete. Eyes moderately large, 20 ocelli. Supra-antennal line prominent, deeply curved in middle. Profrons darkly pigmented, contrasting with yellow vertex and profrons. In general, form typical of the genus.

Thorax. Hind borders of tergites 1 to 5 gently sinuate, 6 and 7 curved; postero-lateral angles only feebly developed on 6 and 7.

Abdomen. Epimera not adpressed, but prominent on 4 and 5; not very contracted. Telson almost arcuate, scarcely emarginate at sides, median angle not developed.

Appendages. Antennae slender; flagellum with three subequal articles, as long as fifth segment; reaches to hind border of second tergite. Mandibles: right penicilli 2+0; left penicilli 1+2. Maxillula: outer endite, 4+4 (all simple); inner endite without spine, penicilli moderately long and not stout. Maxilla: outer lobe lamellate, very sparsely setose; inner lobe coarsely setose; two stout bristles between the two. Maxillipede: endite with strong vertical comb of setae on inner face, distal end minutely setose, outer corner with one sharp spine, one large spine on face. Pleopoda: first of male oval in form, without angles or projections. Uropod: protopod small, not exceeding telson; exopod lanceolate and short; endopod, three fourths exopod, flat, set slightly proximal to exopod.

Austral Islands: southeast islet, Marotiri, July 22, 1934 (Z, F).

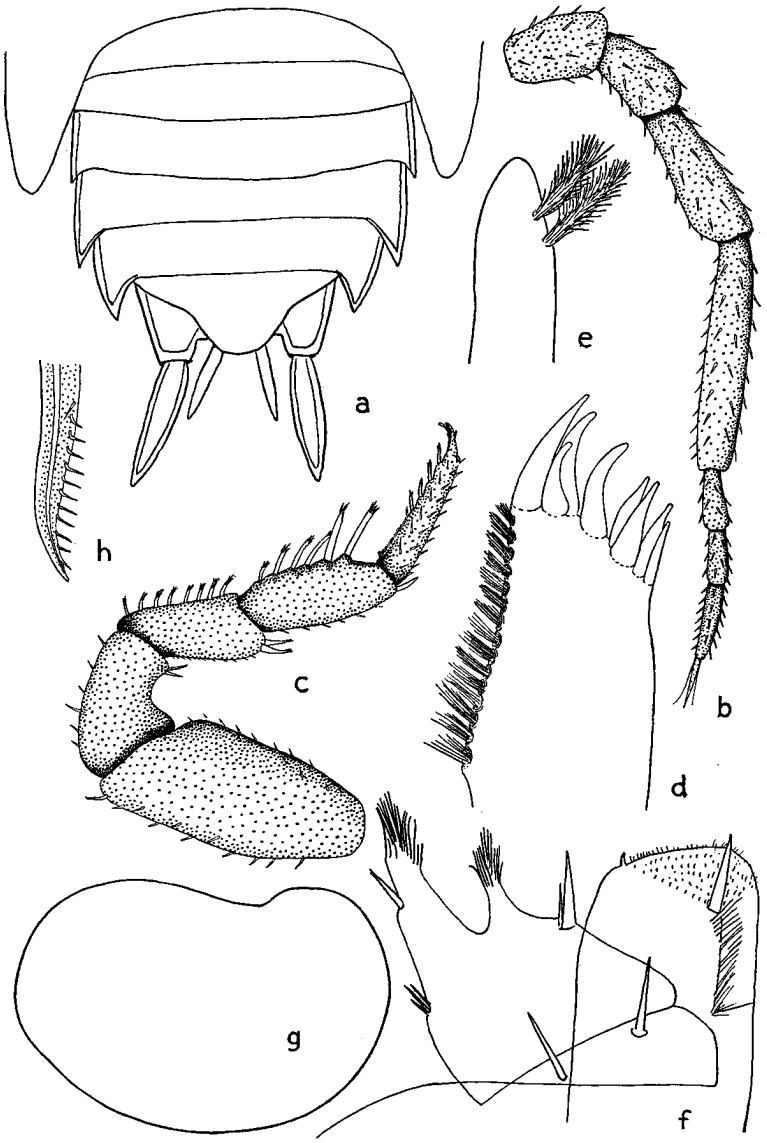

FIGURE 4.—*Philoscia persona,* new species: *a,* abdomen and telson; *b,* antenna; *c,* 1st peraeopod, ♂ ; *d,* maxillula, outer endite; *e,* maxillula, inner endite; *f,* maxillipede; *g,* 1st exopleopod, ♂ ; *h,* tip of endopod of 1st pleopod, ♂.

Philoscia squamosa, new species (fig. 5, *a-c*).

Length, male 3.75 mm., female 5 mm.; breadth, male 1.25 mm., female 2.5 mm.

Shape, elongate oval. Surface, very rough, uniformly covered with "schuppenborsten" and scales. Color, in alcohol, even light purplish brown, muscle markings in white.

Head discrete. Eyes small, 12 ocelli. Supra-antennal line prominent, deeply curved in midline. In general form, typical of the genus.

Thorax. Hind borders of 1 to 4 tergites transverse, 5 scarcely curved, 6 and 7 curved. Postero-lateral angles absent up to 6, which is little drawn out.

Abdomen. Epimera adpressed but distinctly visible from above, abruptly contracted. Telson, hind border bluntly triangulate, almost arcuate, median angle obsolete.

Appendages. Antenna rather stout; flagellum with three articles, the two proximal of which are shorter than the third and together about equal to it. Very setose. Mandibles: right penicilli 2+0; left penicilli 1+2. Maxillula: outer endite 4+4 (all simple); inner endite without spine, two short but not stout penicilli. Maxillipede: endite with strong, vertical comb of setae on outer face; distal end sparsely setose; outer corner with small triangular spine, large spine on face. Pleopoda: first of male oval, without angles or projections. Uropod: protopod shorter than telson; exopod moderately long and slender; endopod short, about one-half exopod and set slightly proximal to it.

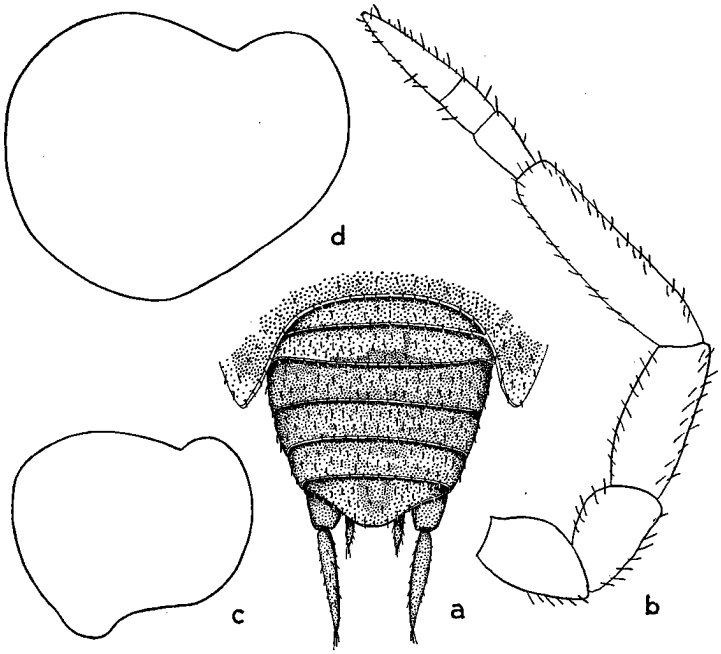

FIGURE 5.—*Philoscia squamosa,* new species: *a,* abdomen and telson; *b,* antenna; *c,* 1st exopleopod, ♂. *Philoscia (Paraphiloscia) gracilis* var. *australis,* new variety: *d,* 1st exopleopod, ♂.

Austral Islands: southeast islet, Marotiri, July 22, 1934 (Z, F).

Although collected at the same place and time as *P. persona, P. squamosa* differs markedly from it and is peculiar for the richly setose surface. Neither of these new species fits comfortably into the existing subgenera of *Philoscia,* numerous though these be. I am most unwilling to add to their number, which already vie with each other in the triviality of the characters by which they are divided.

Philoscia squamata var. **setosa,** new variety.

Strikingly hairy appearance. The antenna is short and the flagellum has three subequal articles. From the same locality as *Philoscia squamosa.*

Philoscia fasciata Jackson.

Mangareva Islands: Mangareva, under coconut log, May 27, 1934 (F); Rikitea, May 24, 1934 (C), May 31, 1934.

Pitcairn Island: south side, June 14, 1934 (F).

Henderson Island: alt. 100 ft., under dead leaves, June 20, 1934 (F); northwest side, alt. 100 ft., June 21, 1934 (Z).

Austral Islands: Tubuai, back of Arana Village, Aug. 22, 1934 (W A). Rurutu, bluffs of Avera, Aug. 28, 1934 (W); Mato Naa, Aug. 29, 1934 (W A); southwest slope of Mount Manureva, alt. 1,100 ft., Aug. 29, 1934 (Z); southeast slope of Mount Manureva, alt. 1,100 ft., Aug. 30, 1934 (Z). Raivavae, east slope of Mount Muanui, alt. 500-800 ft., Aug. 8, 1934 (Z); near Ahuoivi Point, Aug. 9, 1934 (Z); Mount Muatapu, Aug. 11, 1934 (F).

Rapa: near Ahurei, wet face of cliff, alt. 150 ft., July 1, 1934 (F); northwest slopes of Mount Tautautu, alt. 700-800 ft., July 9, 1934 (Z); Maitua, alt. 600-800 ft., July 2, 1934 (Z).

Society Islands: Tahiti, Papeari, Tiupi Bay, March 19-21, 1934 (Z); Taohiri, Mount Aorai Trail, alt. 3,500 ft., Sept. 12, 1934 (Z). Moorea, north slope of Mount Teaharoa, 1,500-2,000 ft., Sept. 25, 1934 (Z); Faatoai Valley, alt. 100-300 ft., Sept. 23, 1934 (Z).

Described from the Marquesas (5) and recorded from Tahiti. The species is evidently widely distributed in Polynesia.

Alloniscus oahuensis Budde-Lund.

Mangareva Islands: Rikitea, under coconut log, May 27, 1934 (F); Aukena, northwest side, May 28, 1934 (Z); Aha Mara, sea level, under half coconut, May 30, 1934 (C).

Austral Islands: Tubuai, Murivai, alt. 10 ft., Aug. 11, 1934 (Z). Raivavae, alt. 10 ft., Aug. 12, 1934 (Z).

Society Islands: Tahiti, Papeari, Tiupi Bay, April 4, 1934 (Z).

Fanning Island: Vai Tepu, April 25, 1934 (F).

Reasons for the identification of this species with *A. brevis* Budde-Lund are given in my Marquesas paper (5). It seems to be widely distributed in Polynesia.

Genus **CERBEROIDES**, new genus

Epimera absent on first, second, and third abdominal somites.

Head. Lateral lobes present; frontal and supra-antennal lines present or absent; antennal flagellum triarticulate; general structure of mouthparts *Philoscia*-like; inner endite of maxillula with two short and stout penicilli. Pseudotracheae weakly developed on all pleopoda. Thoracic epimera weakly developed. Telson bluntly triangulate.

It would seem that the loss of the epimera of the third abdominal somite has only been recorded once before in the terrestrial isopods, by Chilton in *Notoniscus* (2), a genus allied to *Haplophthalmus* of the Trichoniscidae. This character is sufficiently remarkable to group together the three subgenera described below in spite of their otherwise divergent characters. Except for this character they would superficially seem to have little in common, the general facies of each being that of an "Armadillo", a "Philoscia", and an "Oniscus". The very conservative mouthparts, however, which are surprisingly enough almost identical in the three forms, bind them together and make association with any other group but the subfamily *Oniscinae* impossible.

One may conjecture that all three forms have evolved from a *Philoscia*-like ancestor; one retaining many of the characters and habits of *Philoscia* (recorded from "under stones" at 700 ft.), another moving in the direction of the Porcellionine forms ("in dead tree fern fronds" at 1,300-1,500 ft.), and a third becoming most emphatically modified as a "conglobating" form, probably with more power of resisting desiccation than the others (the collector gives no habitat for this form, simply 1,000-1,100 ft.). The stability of the mouthparts during these considerable changes in form and perhaps habitat, seem to justify the faith placed by most students of this group in their value as a basis for classification.

Subgenus **PHILOSCODILLO,** new subgenus

Head. Lateral lobes tumid and slightly produced; frontal line absent; supra-antennal line strong. Postero-lateral angles of thoracic tergites very weak and rounded or absent.

Cerberoides (Philoscodillo) pilosus, new species (fig. 6). (For mouthparts see fig. 8, *a-d.*)

Female only. Length 3.75 mm., breadth 1.75 mm.

Shape, oblong oval. Surface, smooth, minutely scaly and setose. Color, in alcohol, leaden purple with uniform yellow markings; mid-dorsal line yellow.

Head. Eyes small, 10 ocelli. Lateral lobes tumid rolls, only slightly produced; median lobe absent; marginal line dips sharply below eye (discrete); frontal line inconspicuous, but upper margin of profrons is marked by a distinct fold; supra-antennal line distinct, low on face restricting postfrons, curved in midline becoming indistinct over antennary sockets; antennary tubercle small and inconspicuous; lateral processes of clypeus large.

Thorax. Hind margin of tergites all slightly sinuate; postero-lateral angles absent on 1 to 4 and bluntly rounded on remainder.

Abdomen. Very short, the postero-lateral angles of the thoracic tergite 7 attaining hind border of abdominal tergite 4. Epimera absent on 1, 2, and 3, well marked on 4 and 5. Telson bluntly triangulate, apex slightly exceeding 5; twice as broad as long.

Appendages. Antennule slender, three equal segments. Antenna absent. Mandibles: right, penicilli 2+0 (?); left, penicilli 1+2. Maxillula: outer endite 4+5 (all simple); inner endite without spine, penicilli short and stout. Maxilla: outer lobe sparsely setose; inner strong coarse setae; between the lobes three spines. Maxillipede: endite minutely setose at distal end, one small tooth at outer corner, short brush at inner corner, one large bristle on face. Pleopoda: rudimentary pseudo-tracheae present. Uropod: protopod slightly shorter than telson, nearly as broad as long; exopod and endopod equal in length and short, endopod originates much above exopod, flattened laterally.

Rapa: south side of Mount Tanga, under stones, alt. 700 ft., July 23, 1934 (DA).

The conformation of the lateral plates of the tergites and the abbreviated uropods suggest that this form has considerable powers of rolling up, but, if so, it is a primitive specimen of that genre, as the head is in essentials of the "Philoscia" type, without any tendency toward the characteristic flattening and frontal shield of typical rolling forms.

Subgenus **ONISCOMORPHUS,** new subgenus

Head. Lateral lobes prominent, blunt, and fingerlike; median lobe slight; frontal line strong and low; supra-antennary line absent. Postero-lateral angles of thoracic tergites slightly produced.

Cerberoides (Oniscomorphus) bicornis, new species (figs. 7; 8, *a-d*).

Female only. Length 5.75 mm., breadth 3.5 mm. Shape, oblong oval. Surface smooth, shining, minutely scaly. Color, in alcohol, yellow ground mottled with brown pigment.

Head. Eyes small, 10 ocelli. Lateral lobes prominent and somewhat bulbous; median lobe slightly produced; marginal line turns down in gentle curve below eyes; frontal line well marked, curves down low on face and on each side runs up above lateral lobes without joining them; supra-antennal line absent except at each side above antennal sockets, on each side of which it joins antennary tubercle; lateral processes of clypeus small, pointed and slender.

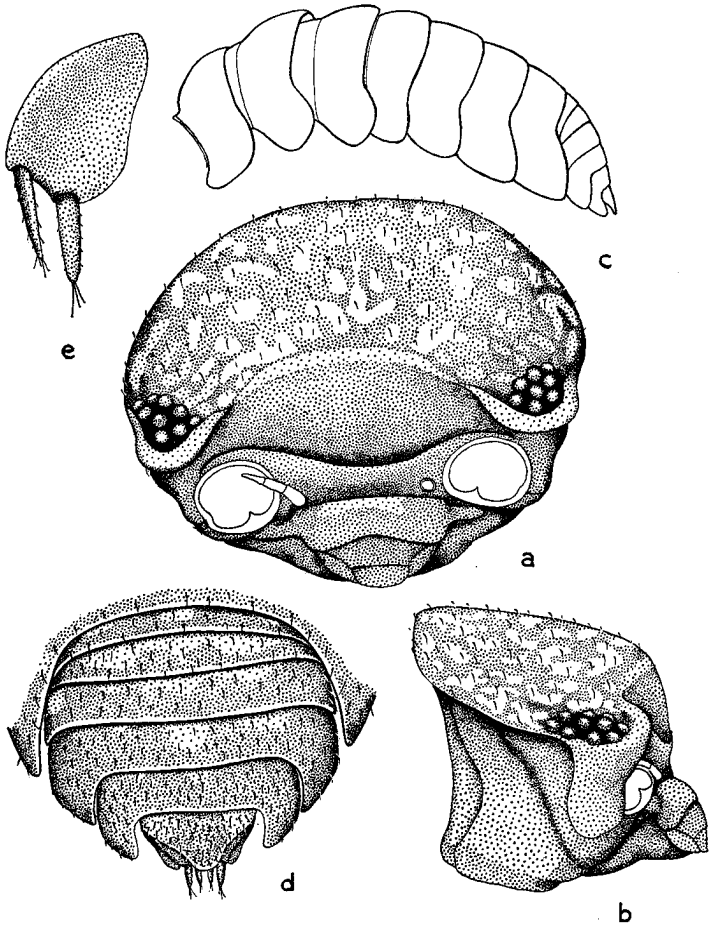

FIGURE 6.—*Cerberoides (Philoscodillo) pilosus,* new species: *a,* head from front; *b,* head from side; *c,* thorax and abdomen from side; *d,* abdomen and telson from above; *e,* uropod.

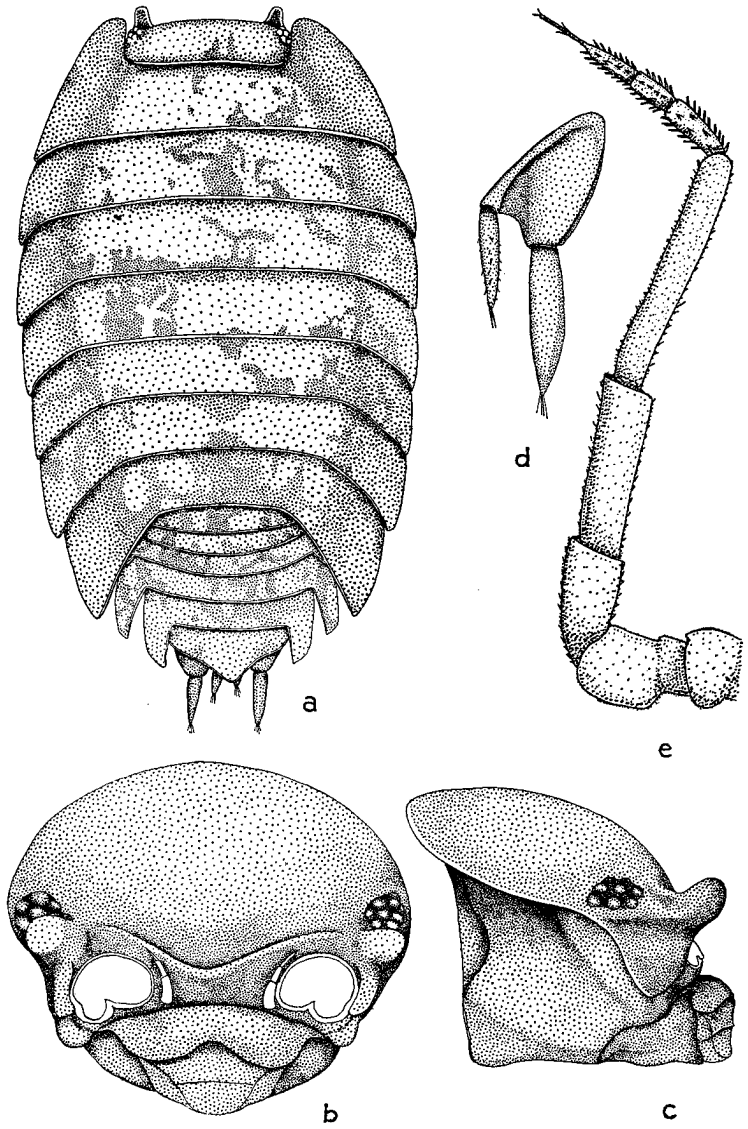

FIGURE 7.—*Cerberoides* (*Oniscomorphus*) *bicornis*, new species: *a*, whole specimen from above; *b*, head from front; *c*, head from side; *d*, uropod; *e*, antenna.

Thorax. All tergites curved, very slightly in front and increasingly behind; postero-lateral angles very slightly formed.

Abdomen. Very short, postero-lateral angles of thoracic tergite 7 surpassing the hind border, but not the epimera, of abdominal tergite 4. Epimera absent on 1, 2, and 3; very well formed on 4 and 5. Telson bluntly triangulate, lateral borders emarginate; apex exceeding 5; twice as broad as long.

Appendages. Antenna: flagellum of three subequal articles, shorter than fifth segment. Mouthparts as described for *Philoscodillo* above. Pleopoda: rudimentary pseudo-tracheae present. Uropod: protopod slightly shorter than telson, breadth two thirds length, excavated on lower face; exopod lanceolate, short; endopod originating well above exopod and two thirds its length.

Rapa: northeast ridge of Mount Perahu, in dead tree fern fronds, alt. 1,300-1,500 ft., July 15, 1934 (Z).

Except for the shortness of the abdomen and the relatively poorly developed postero-lateral angles, this form has the superficial appearance of an *Oniscus*. The head is, however, fundamentally different in detail and is susceptible of another interpretation than that given above. The lateral lobes may be looked upon as greatly hypertrophied antennary tubercles (as in *Deto*) and the lines between them as the supra-antennal line. More specimens would make a dissection of the head possible and settle the point.

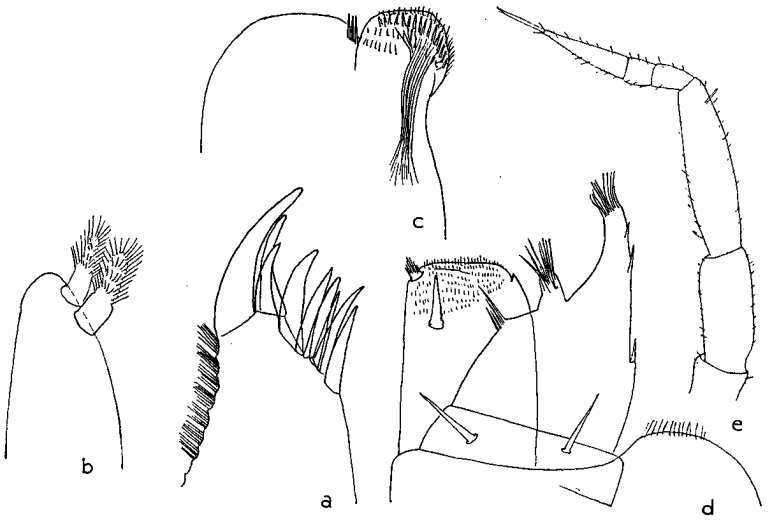

FIGURE 8.—*Cerberoides* (*Oniscomorphus*) *bicornis*: *a*, maxillula, outer endite; *b*, maxillula, inner endite; *c*, maxilla; *d*, maxillipede. *Cerberoides* (*Conglobiscus*) *brevicauda*; *e*, antenna.

Subgenus **CONGLOBONISCUS,** new subgenus

Head. Lateral lobes not pronounced but distinct; median lobe slight; frontal line and supra-antennal lines strong and high, whole head distinctly flattened antero-posteriorly as in conglobating forms of the "Armadillo" type. Postero-lateral angles of thoracic tergites absent. Pronotum wide.

Cerberoides (Conglobonisicus) brevicauda, new species (figs. 8, *c*; 9). (For mouthparts see fig. 8, *a-d.*)

Females only. Length 4.5 mm., breadth 1.75 mm.

Shape, broad oval. Surface, smooth and minutely scaly. Color, in alcohol, yellow ground extensively mottled with brown pigment.

Head. Eyes small, 9 ocelli. Lateral lobes not very pronounced but indicated; median lobe slightly raised, profrons deeply hollowed under lobe; marginal line dips at slight angle below eye; frontal line distinct and raised; supra-antennal line very strongly marked, passing on each side to antennary tubercles, which form large blunt shelf-like protuberances over antennary sockets; postfrons slightly bulbous and high. Lateral lobes of clypeus moderately large and sickle-shaped.

Thorax. Hind margins of tergites sinuate; lateral margins rounded, no postero-lateral angles; pronotum about half breadth of tergite; dorsal surface of head and each tergite with well-marked longitudinal folds.

Abdomen. Very short; postero-lateral angles of thoracic tergite 7 greatly exceed hind border of 4 but just fail to pass the epimera; epimera of 1, 2, and 3 absent; hind margin of 5 horseshoe-shaped, enclosing telson which scarcely exceeds it. Telson, posterior margin bluntly triangulate, sides slightly emarginate; two thirds broader than long.

Appendages. Antenna: flagellum triarticulate, proximal articles short, distal more than twice as long as combined proximal. Mouthparts as described for *Philoscodillo* above. Pleopoda: rudimentary pseudo-tracheae present. Uropod: protopod broad and pear-shaped; exopod short, lanceolate, placed at narrow posterior extremity of protopod; endopod set above exopod nearly half of protopod, about same length as exopod.

Rapa: northeast ridge of Mangaoa Peak, alt. 1,000-1,100 ft., July 29, 1934 (Z).

This is the most modified member of the Oniscinae and exhibits as striking an adaptation to the rolling up habit as is found outside the "Armadillo" group.

SUBFAMILY PORCELLIONIINAE

Porcellio (Mesoporcellio) laevis Latreille.

Mangareva Islands: Akamaru, under half coconut, at sea level, May 30, 1934 (C).

Distributed sporadically throughout the Pacific islands.

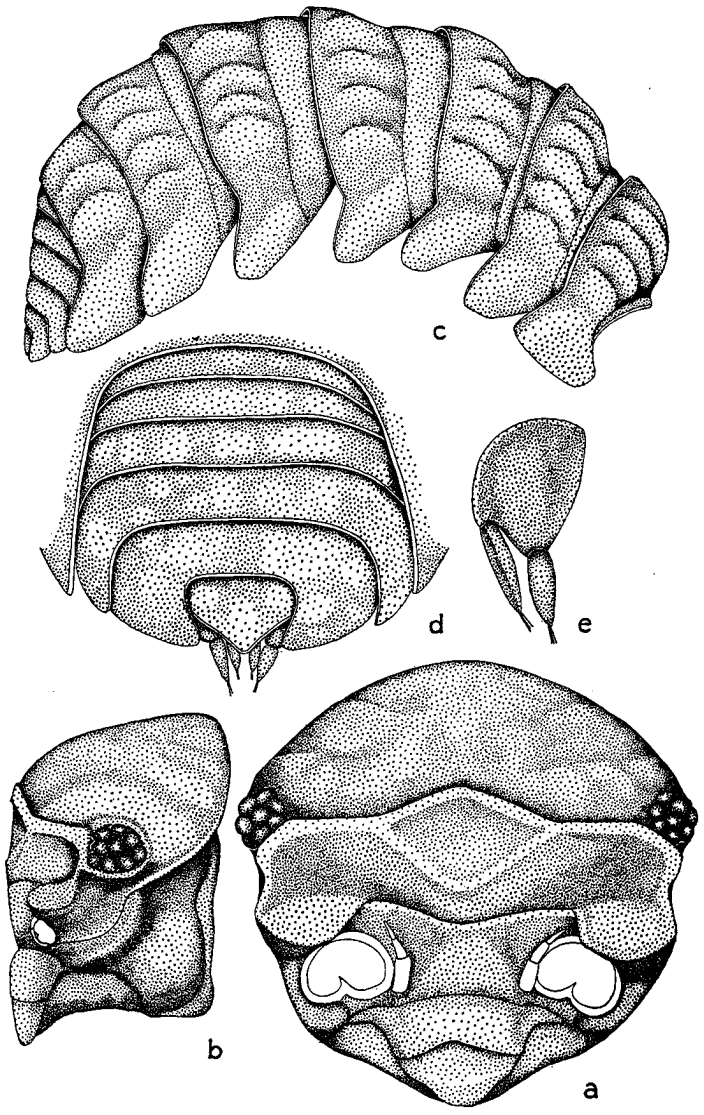

FIGURE 9.—*Cerberoides* (*Conglobonisicus*) *brevicauda,* new species: *a,* head from front; *b,* head from side; c, thorax and abdomen from side; *d,* abdomen and telson from above; *e,* uropod.

Porcellio (Porcellio) scaber Latreille.

Rapa: near Area, alt. 10 ft., June 30, 1934 (Z); ravine above Area, alt. 378 ft., July 2, 1934 (F); Maitua, alt. 600-800 ft., July 2, 1934 (C, Z); north slope of Mount Ororangi, July 3, 1934 (C, Z); southeast valley, Mount Ororangi, alt. 600-700 ft., July 3, 1934 (Z); top Mount Ororangi, July 6, 1934 (F); northeast ridge of Mangaoa Peak, alt. 900-1,200 ft., July 6, 1934 (Z); northeast ridge of Mangaoa Peak, alt. 1,000-1,200 ft., July 25, 1934 (Z); northwest slopes of Mount Tautautu, alt. 700-800 ft., July 9, 1934 (Z); near Morongota, alt. 500-800 ft., July 11, 1934 (Z); Moio, alt. 900 ft., July 13, 1934 (F); Karapo Rahi Islet, alt. 100-300 ft., July 18, 1934 (Z); northeast slopes of Mount Tevaitahu, alt. 600-800 ft., July 8, 1934 (Z).

This is the first record of the typically European *Porcellio scaber* from the south Pacific islands, and, occurring in such large numbers on a single island, it has obviously been introduced accidentally and has prospered.

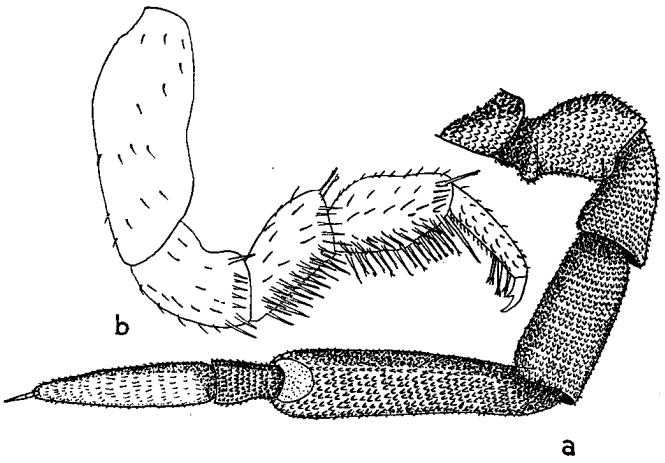

FIGURE 10.—*Porcellio* (*Heminagara*) *tahitiensis*: *a*, antenna; *b*, 1st peraeopod ♂.

Nagara (Heminagara) tahitiensis Jackson (fig. 10).

Mangareva Islands: Mangareva, Rikitea, May 31, 1934 (no collection label).

Austral Islands: Tubuai, Murivai, alt. 10 ft., Aug. 11, 1934 (Z); Maria, northeast islet, Sept. 6, 1934 (Z).

Society Islands: Raiatea, Tetaro Islet, alt. 3 ft., Oct. 4, 1934 (Z).
Christmas Island: Griegs Grove, alt. 3 ft., Oct. 21, 1934 (Z).

Described from Tahiti (4), this species is evidently more widely distributed than was suspected. The record from Christmas Island is, however, too wide for a comfortable credulity; there is no doubt about the identity of the specimens, but there may be legitimate suspicion as to the correctness of the locality.

All of these specimens, while agreeing in every other particular with the type, have fewer ocelli—16 to 17 as against 20. Females differ in no substantial characters from males. The antenna, which was missing in the type, is figured here, with the first peraeopod of the male. The antenna is short and strongly formed, the flagellum equals the fifth segment and its proximal article is one third the distal one. All pleopods have rudimentary pseudo-tracheae.

Porcellio (Porcellionides) pruinosus Brandt.

Fanning Island: Cable Station, under coral pebbles, April 21, 1934 (F).

Of world-wide distribution; it is surprising that this is the only record from this extensive collection.

Subfamily Armadillinae

Spherillo (Spherillo) testudinalis Budde-Lund.

Mangareva Islands: Mangareva, at sea level, May 30, 1934 (F).

Austral Islands: Raivavae, Taraia Hill, Aug. 5, 1934 (C). Tubuai, Teraetu, west slope, Aug. 22, 1934 (C, D A).

Society Islands: Tahiti, Papeari, Tiupi Bay, March 19-21, 1934 (Z); Fautaua Valley, alt. 200 ft., May 7, 1934 (Z). Raiatea, Tetaro Island, Oct. 5, 1934 (C); Hureu Islet, Oct. 10, 1934 (C). Moorea, Faatoai Valley, alt. 100-300 ft., Sept. 23, 1934 (Z). Tahaa, east ridge of Mount Purauti, alt. 600-900 ft., Oct. 10, 1934 (Z). Meetia, under stones, alt. 500 ft., May 12, 1934 (C).

Spherillo (Spherillo) montivagus Budde-Lund.

Mangareva Islands: Mangareva, pass west of Rikitea, under moss and rocks, May 1934 (F); northeast slope of Mount Duff under rotten bark, alt. 300 ft., May 1934 (Z); Rikitea, May 25-26, 1934 (C); Gatavake, under stones and dead leaves, May 27, 1934 (C).

Pitcairn Island: south side, June 14, 1934 (Z).

Henderson Island: under dead leaves, alt. 100 ft., June 20, 1934 (F).

Rapa: southeast valley of Mount Ororangi, alt. 600-700 ft., July 3, 1934 (Z); Mount Tevaitahu, alt. 600-800 ft., Aug. 8, 1934 (Z).

Austral Islands: Raivavae, Mount Muatapu, Aug. 11, 1934 (F). Tubuai, Teraetu, west slope, Aug. 22, 1934 (C, D A).

Spherillo (Xestodillo) marquesarum Jackson.

Mangareva Islands: Mangareva, pass west of Rikitea, under moss and rocks (F).

Pitcairn Island, Middle Hill, June 14-15, 1934 (F).

Henderson Island, alt. 5 ft., in base of *Asplenium nidus,* June 21, 1937 (F).

Austral Islands: Raivavae, Hotuatua Islet, Aug. 11, 1934 (C, Z, W A). Rurutu, bluff north of Moerai, under trash, Aug. 25, 1934 (C); Mount Manureva, southwest slope, alt. 1,100 ft., Aug. 29, 1934 (Z). Rimatara, top of mountain, Sept. 5, 1934 (J).

Society Islands: Tahiti, Fautaua Valley, alt. 750 ft., May 7, 1934 (F); Taohiri, Mount Aorai Trail, alt. 3,500 ft., Sept. 12, 1934 (Z); Mount Aorai Trail, alt. 5,500-6,300 ft., Sept. 15, 1934 (Z); Papenoo Valley, under stones and in moss, alt. 1,500 ft., Sept. 16. 1934 (F) Moorea, Faatoai Valley, alt. 300 ft., Sept. 24, 1934 (Z).

Spherillo marquesarum var. **australis,** new variety.

Some of the specimens collected in the Austral Islands make a pronounced approach to *Spherillo montivagus* and have accordingly been given the rank of variety.

The groove on the tumid edge of the first tergite is less pronounced than in *S. marquesarum,* and the outer fold does not reach so far down; the exopod of the uropod is smaller; the flagellum of the antenna is very slender and the eyes are smaller (10 ocelli). All these characters show an approach to *S. montivagus.* The color tends to be paler except on the seventh tergite and head, which tend to retain the dark purple-brown in contrast to the yellowish body.

Austral Islands: Tubuai, Mount Taitaa, alt. 1,000 ft., Aug. 15. 1934 (Z); Mount Tavaetu, alt. 800 ft., Aug. 22, 1934 (Z); Mount Tavaetu, northeast slope, under stones, Aug. 22, 1934 (J); Mount Taitaa, southwest slope, alt. 1,200 ft., Aug. 23, 1934 (Z). Raivavae, Taraia Hill slope, under trash, Aug. 9, 1934 (Z); Hotuatua Islet,

alt. 15 ft., Aug. 11, 1934 (Z). Rurutu, Mount Manureva, southeast slope, alt. 1,100 ft., Aug. 30, 1934 (Z).

Cubaris murinus Brandt.

Mangareva Islands: Mangareva, northwest slope of Mount Duff, alt. 300 ft., *Hibiscus tiliaceus* trunk, May 23, 1934 (Z), May 26, 1934 (C); Rikitea, May 25, 1934 (C); sea level, May 30, 1934 (F); Gatavake, under stones and dead leaves, May 27, 1934 (C).

Austral Islands: Raivavae, near Unurau, Aug. 3, 1934 (Z); south slope of Pic Rouge, alt. 200-400 ft., Aug. 5, 1934 (Z); near Anatonu, alt. 10 ft., Aug. 12, 1934 (Z).

Rapa: Mount Taga, above watering place, July 27, 1934 (DA).

Society Islands: Tahiti, Mount Aorai Trail, alt. 5,500-5,600 ft., Oct. 14, 1934 (Z). Moorea, Faatoai Valley, Oct. 23, 1934 (C, K).

Fanning Island, Cable Station, under coral pebbles, April 21, 1934 (F); English Harbor, under coral shingle, April 22, 1934 (F).

LITERATURE CITED

1. CHILTON, CHARLES, The terrestrial Isopoda of New Zealand: Linn. Soc. Zool., Trans., II, **8**: 99-152, 1901.
2. CHILTON, CHARLES, Some terrestrial Isopoda from New Zealand and Tasmania, with description of a new species: Linn. Soc. Zool., Jour., **32**: 417-427, 1915.
3. JACKSON, H. G., Insects of Samoa, **8** (1):8, Brit. Mus. (Nat. Hist.), 1927.
4. JACKSON, H. G., Porcellio (Heminagara) tahitiensis and other Tahitian terrestrial Isopods: B. P. Bishop Mus., Bull. **113** (17):87-90, (1933), 1935.
5. JACKSON, H. G., Marquesan terrestrial Isopoda: B. P. Bishop Mus., Bull. **114** (10): 145-162, (1933), 1935.
6. VERHOEFF, K. W., Isopoda terrestria von Neu Caledonien und den Loyalty-Inseln: Nova Caledonia, Zool., **4**:243-366, 1926.
7. VERHOEFF, K. W., Uber einige Isopoden der zoologischen Staatssammlung in München: Zool. Anz., **76**:25-36, 1928.