MARQUESAN COLLEMBOLA *

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The Collembola (springtails) collected by the Pacific Entomological Survey in the Marquesas comprise 14 species belonging to 10 genera. Seven of the species appear to be undescribed and new genera are suggested for three of them. Of the 7 other species, 3 are well-known insects with a wide distribution in both the eastern and western hemispheres; 3 are referred to species lately described by J. W. Folsom [1] from specimens collected in the Hawaiian islands; 1 is, I believe, identical with a Javan springtail. For the privilege of studying these very interesting wingless insects I desire to express sincere thanks to Mr. E. P. Mumford and his colleagues.

ORDER COLLEMBOLA

SUB-ORDER ARTHROPLEONA

FAMILY PODURIDAE

SUB-FAMILY NEANURINAE

Genus **MEGANURIDA,** new genus

Head with posterior ocular areas, eight eyes on each side. Cuticle finely granulated; claws of feet coarsely pitted, small empodium. Body elongate, with sixth abdominal segment narrow and tapering dorsally, hiding the relatively large subanal valves; fifth abdominal segment with large ventral genital aperture. Body and appendages with long bristles. Jaws concealed in buccal cone.

This genus resembles Anurida in general aspect, differing in the narrow sixth abdominal segment and the coarsely pitted foot claws which resemble those of *Pseudachorutes*. The type species is remarkable for its large size.

Meganurida mumfordi, new species (fig. 1).

Length 3.8 mm. Color mottled, dark blue and yellow. Upper surface predominantly dark with pale transverse bands before and behind second abdominal tergum. Foot-claws untoothed, pale, coarsely pitted except at the tip; empodium small and blunt (fig. 1, *d, e*). Eyes arranged with the first two outer and the first three inner forming an anterior

[1] Folsom, J. W., Hawaiian Collembola: Hawaiian Ent. Soc., Proc., vol. 8, pp. 51-80, pls. 1-12. 1932.

* Pacific Entomological Survey Publication 7, article 30. Issued November 26, 1934.

group of five, the third and fourth outer with the third inner a posterior group of three (fig. 1, *b*); no postantennal organ apparent; a small convex sense organ at end of third antennal segment. A transverse row of six strong bristles on the trunk segments from first thoracic to third abdominal inclusive; strong lateral bristles on all segments, the sixth abdominal with three strong apical bristles (fig. 1, *a*). The fourth abdominal sternum with a large median pale area which extends forward in an acute angle beneath the third sternum. Genital opening on the fifth sternum with a median pale process directed backward (fig. 1, *f*).

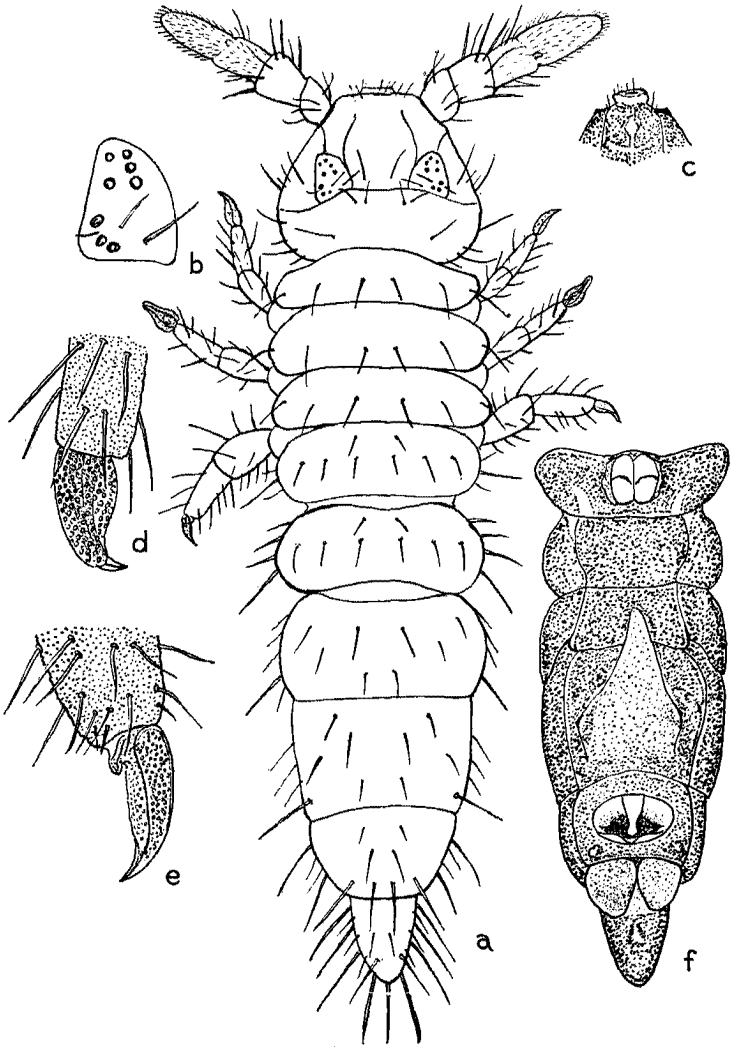

FIGURE 1. *Meganurida mumfordi*, new species: *a*, dorsal view, × 30; *b*, left ocular area, × 74; *c*, buccal cone and mouth, × 30; *d*, front foot (back view), × 104; *e*, hind foot (side view), × 104; *f*, ventral view of abdomen, × 30.

Uapou: Kohepu summit, altitude 3,200 feet, November 28, 1931, on dead stipes of *Cyathea,* 1 specimen, Le Bronnec.

This insect is the most remarkable of all the Marquesan Collembola. As there is only one specimen no examination of the jaws can be undertaken, but the suctorial buccal cone suggests that they are of the reduced, piercing type which is characteristic of several genera belonging to this group.

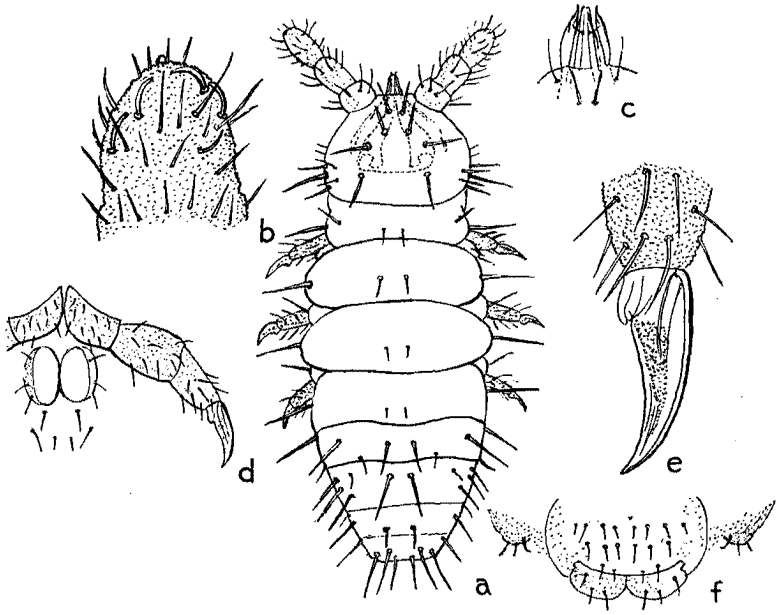

FIGURE 2. *Echinanura elegans,* new species: *a,* dorsal view, × 30; *b,* end of right feeler from above, × 215; *c,* buccal cone and jaws, × 143; *d,* left hind leg, and ventral tube, × 72; *e,* hind foot × 215; *f,* subanal valves, and ventral bosses of 4th abdominal segment, × 90.

Genus ECHINANURA, new genus

Jaws as in *Neanura* (*Achorutes*). No eyes or postantennal organs. Cuticle finely granulated, no tubercles on head or body segments; segmentation of abdomen incomplete posteriorly; hinder end broadly truncated, subanal valves broad and short, lying beneath the fourth abdominal tergum; head and body with stout, strong spines. Foot claws with feebly pitted central area and short, blunt empodium.

Echinanura elegans, new species (fig. 2).

Length 2 mm. White, with delicate cuticle. Antennae as long as head; fourth antennal segment with four stout olfactory hairs and apical sense organ (fig. 2, *b*). Head with four pairs of dorsal spines and three lateral spines on each side. Thoracic and first abdominal segments with short dorsal and strong lateral spines; hinder abdominal

segments with strong dorsal, dorsolateral and lateral spines. Foot claw (fig. 2, *e*) without teeth.

Hivaoa: Matauuna, altitude 3,900 feet, March 4, 1930, 1 specimen, Mumford and Adamson.

Genus **SERICANURA,** new genus

Cuticle delicate, very finely granulated. Jaws hidden within short buccal cone. No eyes or postantennal organs. Head and body segments without tubercles, bearing long, flexible bristles. Segmentation of abdomen not apparent, indicated only by arrangement of bristles and the two short lobes of the terminal (sixth) segment. Foot claws with feebly pitted central area; empodium small and acute.

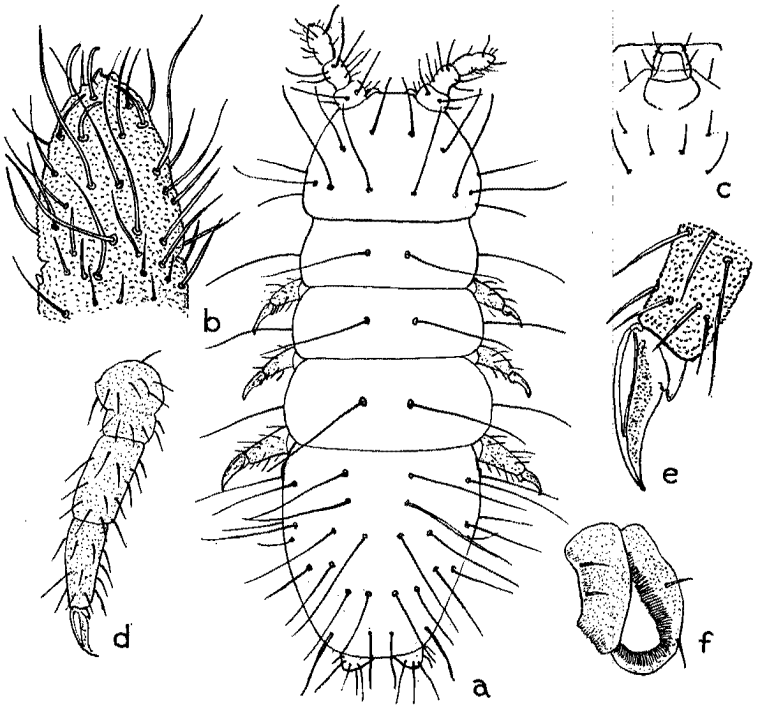

FIGURE 3. *Sericanura pacifica,* new species: *a,* dorsal view, × 30; *b,* tip of left feeler from above, × 215; *c,* buccal cone and jaws, × 143; *d,* left hind leg, and ventral tube, × 107.

Sericanura pacifica, new species (fig. 3).

Length 2.8 mm. White. Antennae shorter than head; fourth segment with acute apical process, small discoid sense organ and five subapical olfactory hairs; a peglike sense organ near limit of third segment (fig. 3, *b*). Head with anterior dorsal and central dorsolateral pairs of bristles, and a hind row of three pairs of bristles besides two pairs situated laterally (fig. 3, *a*). Thoracic segments each with a dorsal and a lateral pair of very long bristles; first, second, and third abdominal segments each with

three pairs of long bristles; fourth with four pairs and fifth with two pairs; each lobe of the sixth segment with four bristles. Foot claw untoothed (fig. 3, *e*). Lobes of ventral tube with ridged margins (fig. 3, *f*).

Hivaoa: Matauuna, altitude 3,900 feet, March 3, 1930, under dead leaves on ground, 1 specimen, Mumford and Adamson.

The long flexible bristles give to this insect a characteristic silky aspect, expressed in the generic name, contrasting with the spiny armature of *Echinanura,* though *Sericanura* agrees with the genus in the smooth cuticle and the absence of segmental tubercles.

Genus **NEANURA,** Macgillivray

Neanura Macgillivray: Canad. Ent., vol. 25, pp. 127-128, 313-318, 1893.
Achorutes (in part) Templeton: Ent. Soc. London, Trans., vol. 1, 1835, Börner: Naturhist. Mus., Hamburg, Mitt., vol. 13, 1906.

Neanura hirtella (Börner).

Achorutes hirtellus Börner: Naturhist. Mus., Hamburg, Mitt., vol. 23, pp. 170-171, 1906; Handschin: Treubia, vol. 8, pp. 452-453, fig. 3, 1926.

Uahuka: Putatauua, Vaipaee Valley, altitude 880 feet, September 21, 1929, on rotting banana trunk, 1 specimen.

This specimen agrees with Handschin's description and figures, the foot claw being without the tooth which is mentioned in Börner's description. The springtails studied by both these investigators were collected in Java.

Neanura insularum, new species (fig. 4).

Length 1.7 mm. Head with two small anterior tubercles, large ocular tubercles each with two eyes; and, behind, a feebly developed elongate central tubercle and two pairs of round tubercles (fig. 4, *a, c*). Feelers as long as head, an ovate sense organ at the edge of the third antennal segment, five olfactory bristles and a bilobed sense organ at the tip of the fourth segment (fig. 4, *b*). Body segments, prothorax to third abdominal inclusive, each with three pairs of tubercles, fourth and fifth abdominal each with two pairs of tubercles, sixth (terminal) segment with a pair of rounded lateral lobes, and truncate centrally (fig. 4, *e*). Foot (fig. 4, *d*) with untoothed claw and without empodium. Color (preserved specimens) pale yellow.

Eiao: altitude 1,600 feet, April 16, 1931, many on *Thespesia populnea,* types; altitude 1,800 feet, April 21, 1931, under dead bark of *Pisonia,* 3 specimens; altitude 1,800 feet, April 30, 1931, under bark of *Aleurites moluccana,* 4 specimens; LeBronnec and H. Tauraa; near middle of island, altitude 1,450 feet, October 1, 1929, under bark of *Thespesia populnea,* 2 specimens.

Uahuka: Putatauua [Putataua], Vaipaee Valley, altitude 880 feet, September 29, 1929, in rotting banana trunk, a few, Mumford and Adamson.

Hivaoa: Mounaofefe, altitude 2,010 feet, September 14, 1929, in dead stipes of *Angiopteris,* 8 specimens; Aimoa, altitude 1,515 feet, September 12, 1929, under rotting bark of *Pandanus,* 4 specimens; Mumford and Adamson.

Mohotani: altitude 500 feet, January 31, 1931, 3 specimens on dead *Pisonia,* LeBronnec and H. Tauraa.

This species is nearly related to a Central American insect, *N. macgillivrayi* Denis from Costa Rica,[2] with which it agrees in the number of eyes, the untoothed foot claws, and the general arrangement of the tubercles; in *N. insularum,* however, the anterior median head tubercle is undeveloped and the posterior one very slight, while there is a pair of small but prominent outer hind tubercles not present in *N. macgillivrayi.* The form of the sixth

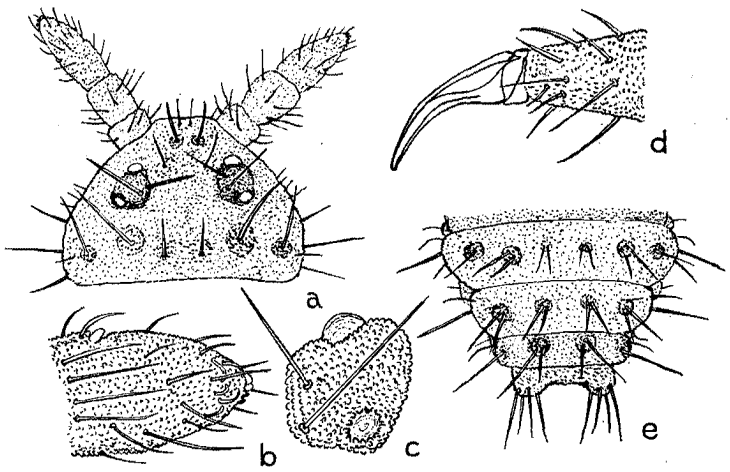

FIGURE 4. *Neanura insularum,* new species: *a,* head, dorsal view, × 92; *b,* tip of left feeler, × 308; *c,* right ocular tubercle, × 308; *d,* front foot, × 381; *e,* third to sixth abdominal segments, dorsal view, × 92.

abdominal segment in *N. insularum* is intermediate between that in *N. macgillivrayi*—"presque rectiline" (Denis)—and that in another member of the same group, the Australian *N. rosacea* Schött,[3] the tail segment of which appears dorsally as a pair of very prominent subglobular lobes in contact with each other on the axis of the body. The North American *N. quadrioculata* Guthrie [4] agrees with *N. insularum* in the number of eyes and the form of the foot claws, but has much shorter feelers than this species. From the list of localities it will be seen that *N. insularum* is widely distributed through the Marquesas, while the number of specimens collected suggests that it may be the commonest member of the order inhabiting the archipelago.

[2] Denis, J. R., Collemboles de Costa Rica avec une contribution au species de l'ordre (2me note): Lab. Zool. R. Inst., Sup. Agrar. Portici, Boll., vol. 27, pp. 225-226, figs. 7-9, 1933.

[3] Schött, H., Results of Swedish Scientific Expedition to Australia, 1910-1913: 15, Collembola, Ark. Zool., vol. 11, p. 7, no. 8, 1917.

[4] Folsom, J. W., North American collembolous insects of the subfamilies Achorutinae, Neanurinae, and Poduridae: U. S. Nat. Mus., Proc., vol. 50, pp. 512-513, figs. 241-245, 1916.

Family ENTOMOBRYIDAE

Subfamily ISOTOMINAE

Genus **ISOTOMA,** Bourlet

Isotoma minor Schäffer.

Isotoma minor Schäffer: Naturhist. Mus. Hamburg, Mitt., vol. 13, p. 182, fig. 63, 1896. Folsom: Hawaiian Ent. Soc., Proc., vol. 8, p. 63, figs. 67-71, 1932.

Nukuhiva: Teuanui, Tovii [Tevanui, Toovii], altitude 2,000 feet, October 24, 1929, 1 specimen, Mumford and Adamson, collectors.

This small, white, blind *Isotoma,* living usually in soil or under bark, is widespread in Europe and North America; it has lately been recorded by Folsom from Hawaii, where it occurred in cane soil near Honolulu.

Genus **ISOTOMURUS,** Börner

Isotomurus palustris (Müller).

Podura palustris Müller: Zool. Dan. Prodr., p. 184, 1776.

Isotoma palustris Tullberg: Kong, Sv. Vet. Akad. Handl., vol. 10, p. 45, pl. 9, figs. 1-8, 1872. Schött: Kong. Sv. Vet. Akad. Handl., vol. 25, pp. 63-67, pl. 5, figs. 6-10, pl. 6, figs. 3-5, 1893.

Isotoma balteata Reuter: Soc. Fauna et Flora Fenn., Medd., vol. 1, pp. 82-86, 1876.

Nukuhiva: Teuanui, Tovii [Tevanui, Tovvii], altitude 2,000 feet, October 24, 1929, on white sheet when collecting at night, several specimens; altitude 2,000 feet, a few; Mumford and Adamson.

This is a common and widespread species, ranging over Europe, North America, and the West Indies, and extending into Melanesia. Folsom[5] has lately recorded it from sugar plantations near Honolulu. Most of the Marquesan specimens belong to the banded variety *balteatus* of Reuter.

Subfamily ENTOMOBRYINAE

Genus **ENTOMOBRYA,** Rondani

Entomobrya lactea Folsom.

Entomobrya lactea Folsom: Hawaiian Ent. Soc., Proc., vol. 8, pp. 65-66, figs. 76-78, 1932.

Eiao: north end, east side, altitude 1,590 feet, October 29, 1929, under bark of *Pandanus,* 1 specimen, Mumford and Adamson.

Hivaoa: Teava Uhia i te Kohu above Puamau, altitude 2,100 feet,

[5] Folsom, J. W., Hawaiian Collembola: Hawaiian Ent. Soc., Proc., vol. 8, p. 63, 1932.

February 15, 1930, from dead stipes of *Cyathea,* 1 specimen, Mumford and Adamson.

This is another of the springtails lately described by Folsom from Hawaii; his specimens were collected at Honolulu "behind sugar-cane leaf-sheaths".

Entomobrya imminuta Folsom.

Entomobrya multifasciata (Tullberg) variety *imminuta* Folsom: Hawaiian Ent. Soc. Proc., vol. 8, pp. 64-65, figs. 72-75, 1932.

Hivaoa: Mounaofefe [Mounaotete], altitude 2,100 feet, September 14, 1929, 1 specimen, Mumford and Adamson.

This specimen agrees closely with Folsom's description and figures of his types from Hawaii (Pupukea). He treats the form as a variety of the common European and North American *Entomobrya multifasciata* Tullberg, with which it agrees in color and markings. As, however, the fourth abdominal segment in *E. imminuta* is much shorter, the feelers much longer, the teeth on the foot claws differently placed, and the two inner proximal eyes very small in this form, as compared with the continental *E. multifasciata,* it may well be regarded as a distinct species.

Genus **SINELLA,** Brook

Sinella coeca (Schött).

Entomobrya coeca Schött: Calif. Acad. Sci., Proc., 2d ser., vol. 6, p. 178, figs. 14-16, 1896.

Sinella höfti Schäffer: Naturhist. Mus. Hamburg, Mitt., vol. 13, p. 192, figs. 102-105, 1896; Folsom: Hawaiian Ent. Soc., Proc., vol. 8, p. 66, figs. 79-81, 1932.

Sinella coeca, Linnaniemi: Soc. Sci. Fenn., Acta, vol. 40, pp. 214-215, pl. 14, fig. 13, 1912.

Uahuka: Putatauua [Putatauuna], altitude 880 feet, September 21, 1929, in rotting banana trunks, 1 specimen, Adamson.

Nukuhiva: Teuanui, Tovii [Tevanui, Toovii], altitude 2,000 feet, October 25, 1929, in rotting banana stems, several, Mumford and Adamson.

Hivaoa: Mounaofefe [Mounaotete], altitude 2,310 feet, September 4, 1929, 1 specimen, Mumford and Adamson.

Mohotani: altitude 500 feet, January 31, 1931, on *Pisonia,* 1 specimen.

This species is well known in Europe and North America. Folsom records it from Hawaii, and I have identified specimens among the Pacific Entomological Survey's collection from Tahiti.

Genus LEPIDOCYRTUS, Bourlet

Lepidocyrtus inornatus Folsom.

Lepidocyrtus inornatus Folsom: Hawaiian Ent. Soc., Proc., vol. 8, p. 68, figs. 92-93, 1932.

Hivaoa: Matauuna, altitude 3,900 feet, March 2, 1930, 1 specimen, Mumford and Adamson.

Nukuhiva: Teuanui, Tovii [Teunui, Toovii], altitude 2,000 feet, October 24, 1929, several specimens; October 20, 1931, a few; altitude 1,800 feet, October 26, 1929, a few; Mumford and Adamson.

These *Lepidocyrti* may all be referred to the Hawaiian species described by Folsom. They differ among themselves in the extent of the dark markings, some being almost uniformly pale, but no structural variation can be detected.

Lepidocyrtus plumosus, new species (fig. 5).

Length 1.5 mm. Mesonotum projecting far over head, twice as long as metanotum. Fourth abdominal segment four times as long as third. Claws of feet (fig. 5 *c*) evenly curved on outer edge, inner edge straight basally then curved, untoothed; empodial appendage half as long as claw, basally with parallel edges, then accuminate. Spring stout, more than half as long as body, dentes two thirds length of manubrium; dorsal aspect of dentes broad and very strongly corrugated, their distal half thickly clothed with large scales; mucro with sharp and prominent ante-apical tooth (fig. 5, *b*). Color generally yellow, the third and fourth antennal segments and the dentes of the spring purple.

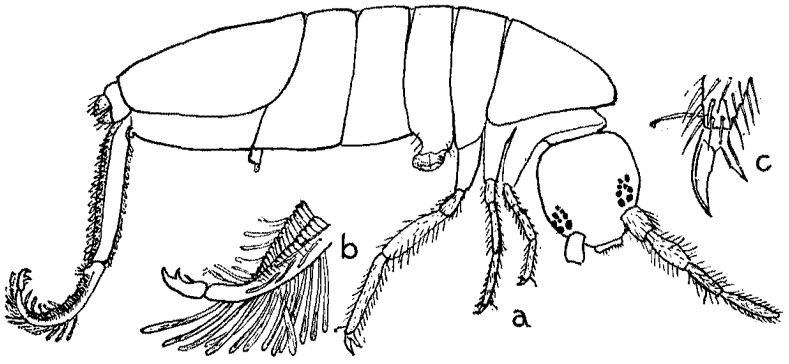

FIGURE 5. *Lepidocyrtus plumosus,* new species: *a,* side view (dorsal view of head), × 90; *b,* terminal part of dens, and mucro, × 287; *c,* hind foot, × 287.

Hivaoa: Matauuna, altitude 3,900 feet, March 4, 1930, on ground under dead leaves, 3 specimens, Mumford and Adamson.

The dense scaling of the spring in this insect gives it a very characteristic appearance and suggests the specific name. I do not know of any nearly allied form.

Genus LEPIDOCYRTINUS, Börner

Lepidocyrtinus armatus, new species (fig. 6).

Length 2.7 mm. Pale yellow with variable purple markings on head, body, legs and feelers. Feelers of adult normally three quarters as long as body. Mesothorax slightly longer than metathorax; fourth abdominal segment nearly five times as long as third. Legs elongate with tibio-tarsal joint usually indicated; all leg segments scaled and bearing feathered bristles, strong flattened spines on tibio-tarsi; tarsal tenent hair broad with marked distal expansion; foot claw with two pairs of small inner teeth, empodial appendage evenly lanceolate (fig. 6, *f, g*); mucro falciform, moderately elongate with apex sharp and vertical (fig. 6, *k*).

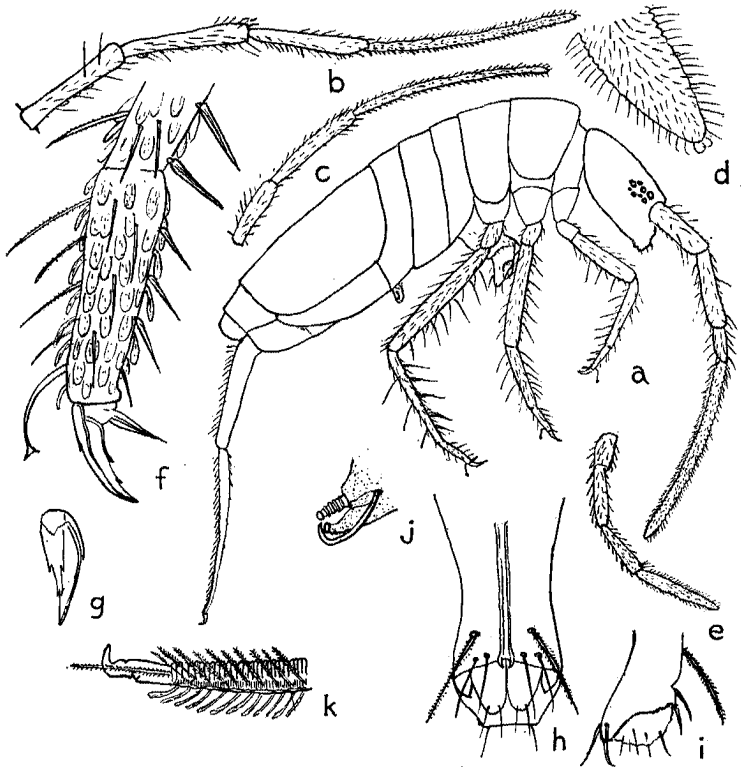

FIGURE 6. *Lepidocyrtinus armatus,* new species: *a,* side view, × 46; *b, c, e,* antennae of three specimens, × 46; *d,* tip of long antenna (*b*), with apical sense organ, × 308; *f,* terminal portion of hind leg, × 295; *g,* foot claw, inner face, × 295; *h,* ventral tube, front view, × 148; *i,* ventral tube, side view, × 148; *j,* catch (retinaculum), oblique view, × 295; *k,* terminal part of dens, and mucro, × 295.

Nukuhiva: Ooumu, altitude 4,050 feet, November 12, 1929, on shrub, 3 specimens, types; in leaf axils of "mouku", 2 specimens; altitude 3,400 feet, November 11, 1929, on *Weinmannia parviflora,* 2 specimens; Mumford and Adamson.

Hivaoa: Kaava Ridge, altitude 2,800 feet, October 27, 1931, on *Ageratum conyzoides,* 2 specimens, LeBronnec; Matauuna, altitude, 3,900 feet, March 14, 1930, on *Vaccinium,* 4 specimens, Mumford and Adamson.

Uapou: Teavaituhai [Teavaituhi], altitude 3,000 feet, slope towards Paaumea, November 20, 1931, beating *Cyathea,* 1 specimen, LeBronnec.

Eiao: north end, east side, altitude 1,590 feet, September 20, 1929, under bark of *Pandanus,* 1 specimen, Adamson.

This species is characterized by the bladelike spines, which, with scales and feathered bristles, are conspicuous on the tibio-tarsi (fig. 6, *f*). The tibio-tarsal joint, evident in adult specimens, is not apparent in smaller individuals. In species of *Lepidocyrtinus,* the terminal antennal segment is subannulated with whorls of hair, and in *L. armatus* it may be nearly as long as the other three segments together (fig. 6, *b*). In some small specimens, however, which may be regarded as immature, the fourth segment is not annulated and only as long as the first and second segments together (fig. 6, *e*). I was at first disposed to regard these insects as belonging to the genus *Drepanocyrtus* of Handschin,[6] but as they agree with the others in the claws and armature of the feet and in the shape of the mucro, and occur in the same localities, all are probably cospecific. The annulation or simple condition of the terminal antennal segment in springtails of this group has been largely used as a character of generic value, as doubtless it often is. But the interesting series from the Marquesas now described suggest that it may also be an indication of comparative age. In some specimens a bifid sense organ (fig. 6, *d*) can be seen at the tip of the feeler.

The ventral tube in *Lepidocyrtinus armatus* has a pair of long, feathered bristles near the edge of the front face of the sheath (fig. 6, *h, i*). The catch (retinaculum) on the third abdominal segment has on the outer face of each of its component appendages four narrow transverse ridges and a prominent terminal knob, and bears in front a stout, curved bristle (fig. 6, *j*). The series of *Lepidocyrtinus armatus* shows great variation in color. Some are uniformly pale yellow, but usually the distal segments of feelers and legs are suffused with purple, as also the front of the head, the dentes of the spring, and the edges of the body segments. Some specimens have on the fourth abdominal segment a broad purple band which may extend on to the adjacent segments, or become, in some examples, broken up into narrow bands or small patches.

Lepidocyrtinus armatus is nearly related to a Sumatran species, *L. taeniatus* Handschin,[7] which has a similar type of variable coloration but lacks the

[6] Handschin, E., Beitrage zur Collembolenfauna der Sundainseln: Treubia, vol. 6, p. 236, 1925.

[7] Handschin, E., Beitrage zur Collembolenfauna der Sundainseln: Treubia, vol. 6, pp. 240-241, figs. 23-27, 1925.

strong leg spines of the Marquesan springtail, from which it is further distinguished by a third pair of inner teeth on the foot claw and a narrower empodial appendage.

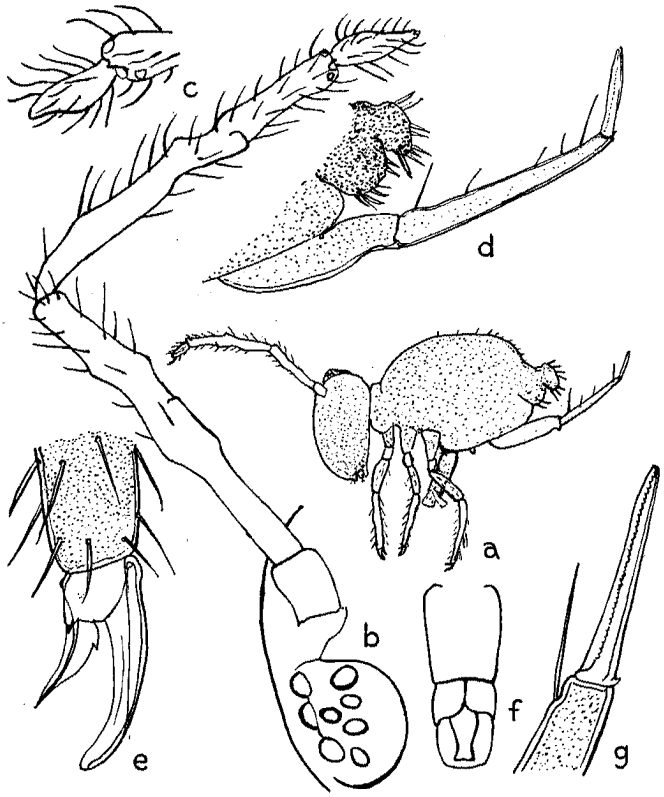

FIGURE 7. *Dicyrtoma insularis,* new species: *a,* side view, × 43; *b,* left feeler and ocular area, × 160; *c,* tip of right feeler, × 200; *d,* hind region of abdomen and spring, side view, × 133; *e,* hind foot, × 453; *f,* ventral tube, front view, × 133; *g,* terminal part of dens, and mucro, × 266.

SUBORDER SYMPHYPLEONA

FAMILY SMINTHURIDAE

SUBFAMILY DICYRTOMINAE

Genus **DICYRTOMA,** Bourlet

Dicyrtomina Börner: Naturhist. Mus., Hamburg, Mitt., vol. 13, 1906.

Dicyrtoma insularis, new species (fig. 7).

Length 1 mm. Eyes on low, subconical prominences; feelers nearly twice as long as head; second and third segments almost equal in length, each five times as long as the

basal and four times as long as the tapering terminal segment (fig. 7, *b, c*), third segment with three drumlike terminal sensory organs (fig. 7, *c*). Foot claw (fig. 7, *e*) untoothed with definite but narrow tunica; empodial appendage lanceolate and tapering, with internal tooth near base. Spring with dens two and three quarters as long as mucro with straight tapering margins and a minutely serrated edge (fig. 7, *g*). Color brown with a few purple patches.

Nukuhiva: Oumu, altitude 4,050 feet, November 12, 1929, on shrub, 2 specimens, Mumford and Adamson.

It is of interest to know that the "globular springtails" are represented in the Marquesas, and by a genus which includes so familiar a British and European species as *Dicyrtoma minuta* (Fabricius). In its general aspect, small size, and short hairs the present species resembles rather *D. rufescens* Reuter[8]. Womersley[9] has recently described a species of this genus from Victoria, Australia. He regards some of the Australian Sminthuridae as endemic and others as introduced. The altitude of this insect's station suggests strongly that it may be regarded as a Marquesan "native".

Notes on Distribution

The examination and identification of the Marquesan springtails open up a number of interesting problems in distribution. The first three species described in this paper represent new and remarkable generic types, and the high altitude at which each was found makes it certain that they belong to the indigenous fauna of the islands. The unique types of *Echinanura* and *Sericanura* were both found at the same locality and elevation on Hivaoa and were taken on succeeding days. They represent allied genera with certain common structural characters, yet each having a special type of bristly clothing.

Neanura hirtella and *Lepidocyrtinus armatus* indicate an Indo-Malayan affinity in part of the Marquesan insect fauna, whereas *Lepidocyrtus inornatus* and the two species of Entomobrya are definitely Hawaiian. *Neanura insularum,* though a new species, belongs to a worldwide group. The two isotomines and *Sinella coeca* are species of almost cosmopolitan range. It would require an intimate knowledge of the local conditions to discuss the question whether the presence of these species in the Marquesas is due to natural extension of range or to introduction through commerce and cultivation. Collembola, being primitively wingless, are insects unlikely to make long oceanic journeys, but as specimens of the order have been found in birds' nests on outlying British and Irish rock islets, it is likely that they

[8] Linnaniemi, W. M., Die Apterygotenfauna Finlands: Soc. Sci. Fenn., Acta, vol. 40, no. 5, pp. 323-324, 1912.

[9] Womersley, H., The Collembola-Symphypleona of Australia, a preliminary account: Commonwealth of Australia, Counc. for Sci. and Indust. Res., pam. 34, pp. 39-40, 1932.

may be carried across ocean tracts by birds. It is noteworthy that, except for the three new genera, *Neanura hirtella, Lepidocyrtus plumosus,* and *Dicyrtoma insularis,* each species of the Marquesan Collembola inhabits several islands of the archipelago.

The apparent absence from the Marquesan fauna of several large and widespread genera of springtails is noteworthy. Among the Poduridae, *Achorutes* (*Hypogastrura*) and its ally *Xenylla* are unrepresented, as well as *Pseudachorutes* and the well-nigh ubiquitous *Onychiurus.* Among the Entomobryidae the Paronellini are absent from this collection, though there is at least one species in the Hawaiian islands, and they are a characteristic feature of the general tropical fauna, in both hemispheres.