LOS INSECTOS DE LAS ISLAS JUAN FERNANDEZ

7. HELEIDAE and TENDIPEDIDAE (Diptera)

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Las especies de las familias Heleidae y Tendipedidae presentadas en este trabajo son las primeras que se mencionan de las Islas Juan Fernández. En el material de Juan Fernández colectado por G. Kuschel y estudiado por el autor en este trabajo, se han encontrado quince especies, de las cuales nueve se describen como nuevas. Las nuevas especies de Heleidae descritas en este trabajo son: *Forcipomyia tenuisquamipes*, *F. sanctaeclarae* y *Dasyhelea australis;* y en Tendipedidae: *Podonomus kuscheli*, *P. selkirki*, *P. discistylus*, *P. acutus*, *Hydrobaenus fernandezensis* y *Clunio fuscipennis*. El género *Podonomus*, un grupo filogenéticamente primitivo, es el mejor representado en las Islas, con el máximo endemismo. Géneros menos primitivos, como *Hydrobaenus*, *Anatopynia*, y *Tanytarsus* están representados por una gran proporción de especies de amplia distribución. En la mayoría de los casos es bien aparente la estrecha relación entre los mosquitos de estas familias procedentes de Juan Fernández y los del territorio continental chileno del Sur.

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Taxonomic and distributional studies of the Pacific biting and nonbiting midges have greatly interested me for a number of years. This interest led to the publication of a revisionary study (1949) of the marine midges of the subfamily Clunioninae, which because of their intertidal breeding habits have reached their greatest development among the various islands and along the continental shores of the Pacific Ocean. It was therefore with distinct pleasure that I received the kind invitation of the Rev. Guillermo Kuschel of Santiago, Chile, to study the splendid collection of midges which he made recently in the Chilean islands of the Juan Fernández group.

Probably because of their minute size and fragile nature, these insects have never been mentioned in previous studies of the Diptera fauna of the Juan Fernández Islands (Enderlein 1940), although a few species of other nematocerous families have been described. However, we are fortunate in having available for comparison the very excellent accounts of Edwards (1931) and Ingram and Macfie (1931) of the Patagonian and South Chilean species which were collected intensively by F. W. Edwards, a very keen specialist himself.

In my study of the Juan Fernández midges, I have tried to give full consideration to the general biogeographical relations of the Islands,

as summarized by Skottsberg (1914, 1925, 1941). Endemism is especially strong in the plants and animals which have been well studied, with repeated instances of endemic species closely related to Chilean species. There are less frequent but all the more interesting examples of relationships with Polynesian forms of a very ancient nature, which Skottsberg considers as vestiges of a Tertiary Antarctic biota connected through Tierra del Fuego on the east and New Zealand on the west. Whether the midge fauna will support this general view, will remain for more intensive collecting and study, especially in the islands of the South Pacific.

The present collection of Juan Fernández midges does, however, lend itself to a few distributional and phylogenetic observations. The genus *Podonomus* Philippi, a very primitive group with several points of similarity to the heleids, shows the most marked speciation of all the Juan Fernández midges, with six species represented in the present material, four of which are endemic, one a Chilean species, and the sixth very widely distributed over the world. All the heleids in this collection are from the primitive section of the family, all endemic but belonging to groups well recognized elsewhere. The single clunionine species shows a number of characters which I would class as primitive for the specialized, but widespread and therefore probably very ancient, genus *Clunio*. The remaining tendipedid species belonging to more advanced groups show less evidence of endemism, since *Hydrobaenus pratorum* (Goet.), *H. pusillus* (Eaton) and *Tanytarsus flavipes* (Mg.) are widespread species and *Anatopynia vittigera* Edwards is a Chilean species, leaving only one species, *Hydrobaenus fernandezensis*, n. sp. endemic to the islands. I attach much significance to the apparent fact that the greatest representation is of the groups which are considered to be phylogenetically ancient. This is what one would expect in an ancient island group which has always been isolated from any continental connections.

Of the fifteen species here reported, nine are new and presumably endemic. Of these nine, one was collected only on Masatierra, three only on Masafuera, four on both Masatierra and Masafuera, and one on both Masatierra and Santa Clara. Of the six previously known species, four were collected only on Masafuera and of these four, two are known only from Chile and two are widespread. The two other known species are widespread and both were collected on Masatierra and one also on Masafuera. According to Dr. Kuschel, «the fact that the species on Masafuera are better represented, is due to the especial circumstance that the Island has several narrow ravines that are several hundred meters deep where there is water and it is wind-still». The character of one of these ravines, the Quebrada de las Casas, is well illustrated by Skottsberg (1914, plate 4) by two photographs, one taken near its mouth and the other well up in its narrow confines.

For the most part I will follow the classification developed by Edwards and Macfie, although I prefer to use the Meigen, 1800, names as applied to these families by Johannsen and Townes (1952). These authors may also be consulted for a more complete description of terminology, although I have attempted to minimize the use of restricted or specialized terms. I have departed, however, from their system of wing vein terminology and prefer to use Tillyard's modification of the Comstock-Needham system which differs mainly in recognizing the dipterous media as four-branched as in other insects, so that vein Cul becomes M3-4 and the na-

mes of the remaining posterior veins shift in each case to the next one behind (see figures 1 a, 2 a, and 3 c). Wing measurements are made using the basal arculus as the base of the wing, for convenience, which results in my measurements being about a tenth shorter than those made to the wing root. Since the body length is measured on dried specimens it can at best be merely an approximation in these soft-bodied insects.

All the specimens studied were collected during 1951 and 1952 by P. Guillermo Kuschel, to whom the types, allotypes, and a share of the paratype series are being returned for deposit in the collection of the Universidad de Chile at Santiago. The remaining paratypes are deposited in the U. S. National Museum in Washington.

Family HELEIDAE (= CERATOPOGONIDAE)

Subfamily FORCIPOMYIINAE

Forcipomyia tenuisquamipes Wirth, new species (Figure 1, d-g)

♀ Length 1,75 mm., wing 1,5 mm. by 0,6 mm.

Head dark brown including antennae and palpi. Antennae with flagellar segments in proportion of 20 : 20 : 20 : 20 : 20 : 20 : 32 : 32 : 32 : 32 : 35, segments 3-10 short tapering and 11-15 long tapering as in figure 1, g. Palpi (figure 1, e) with segments in proportion of 15 : 25 : 40 : 20 : 16, third segment broadly swollen on basal two-thirds with a deep sensory pit opening through a slightly smaller pore.

Mesonotum and scutellum shining dark brown with numerous, suberect, coarse brown hairs. Small humeral spots and areas in front of wing bases yellowish. Postscutellum and pleura shining dark brown. Legs unicolorous dark brown with long hairs; tibiae each with a dorsal row of long, very slender, lanceolate hairs (figure 1, f); hind basitarsi 1,3 times as long as the second segments; empodia well developed.

Wing with costa extending 0,47 way to wing tip; anterior radial cells completely formed, the second about as long but twice as broad as the first. Macrotrichiae dense and appressed, especially long and humerous over the radial veins; a broad area at wing base and a wide spot just past end of costa pale yellowish-white, the latter spot with whitish macrotrichiae. Wing membrane brownish, whitish in area of costal pale spot; anal angle not developed. Halteres with brownish stems and whitish knobs.

Abdomen subshining, unicolorous dark brown, with abundant dark brown semi-appressed hairs. Spermathecae (figure 1, d) two, slightly unequal and pyriform, with the ducts sclerotized only a short distance.

Holotype ♀, MASATIERRA, Plazoleta del Yunque, Jan. 9, 1952. Paratypes: 3 ♀♀, same data as type.

This species is closely related to *F. edwardsi* Ingram and Macfie and *F. chilensis* (Philippi) from the Chilean mainland and *F. punctum-album* Kieffer from Paraguay and Australia, all of which have the hind tarsal ratio (T_1-T_2) less than 1,0. The wing of *tenuisquamipes* more nearly resembles that of *edwardsi* although the anal angle is more obtuse in the present species. The tibiae of *edwardsi* and *punctum-album* lack the lanceolate scales which are present but very short and broad in *chilensis* and very long and slender in *tenuisquamipes*. The distal antennal segments of the present species are also longer and more tapering.

Forcipomyia (Thyridomyia) sanctaeclarae Wirth, new species (Figure 1, h)

♂ Length of wing 1,25 mm., breadth 0,51 mm.

Head pruinose blackish, antennal plumes black. Mesonotum subsshining dark brownish black, with very evident grayish pollen and with uniform vestiture of short, fine, semi-appressed, dark brown hairs. Scutellum blackish in middle, slightly more brownish on sides; postscutellum black; pleura dark brown with slight gray pollen. Legs brown; tibiae and basitarsi with very long dorsal hairs, the hind tibial combs especially blackish and prominent; hind basitarsi about twice as long as second segments; distal tarsal segments each with well-developed empodium. Wings appearing dark gray, uniformly covered with dense, very fine, short black macrotrichiae, these longer on the radial veins; costa to 0,36 of wing length. Halteres with stems dark, knobs white. Abdomen uniformly brownish black, with dense, fine, suberect hairs.

Genitalia (figure 1, h) with ninth sternite about as broad as long, with deep mesal excavation on posterior margin to 0,65 of length, a transverse, irregularly double row of hairs just cephalad of base of excavation; ninth tergite low and rounded, with very short apicolateral processes each bearing a few long setae. Basistyles slender, 2,6 times as long as broad and about as long as ninth sternite; dististyles 0,8 as long as basistyles, nearly straight and very slender. Aedeagus with anterior lateral arms foot-shaped, the anterior arch between their bases about half as high as total length of aedeagus, posterior margin with a knoblike median process and the broad shoulders produced ventrocaudad in a pair of rounded, twisted flaps. Parameres consisting of a pair of U-shaped, sclerotized processes with anterior angles expanded, the mesal angles obtuse and rather widely separated on the midline and the distal free ends clavate and extending caudal nearly to level of tip of aedeagus.

♀. Wing 0,90 mm. long by 0,40 mm. wide. Color and vestiture as in the male. Antennae short, segments 3-10 slightly broader than long, 11-14 slightly longer than broad, slightly tapering, last segment about twice as long as broad and moderately tapering to blunt apex. Palpi short and dark, details not apparent in pinned specimen. Hind basitarsi 2,2 times as long as second segment. Wing with costa to 0,39 of total length; first anterior radial cell linear and slightly longer than second which is nearly as broad as long.

Holotype ♂, allotype, SANTA CLARA, El Corral, Jan. 6, 1952 («on some moist stones in a small ravine; this water-filtration is the only wet place on the desert island». P. Kuschel). Paratypes, 2 ♂♂, same data as types; 1 ♂, MASATIERRA, Plazoleta del Yunque, 200 m., March 27, 1951.

This species is the first of the subgenus *Thyridomyia* Saunders to be reported from the southern hemisphere. In the structure of the parameres it resembles *colemani* Wirth from western North America, but that species has a much different, mesally cleft aedeagus and a shallower excavation on the ninth sternite. The other species of the subgenus known to me, *palustris* Saunders from Europa and *frutetorum* (Winnertz) from Europe and west Africa and *monilicornis* (Coquillett) from North America, differ even more in the details of the male genitalia.

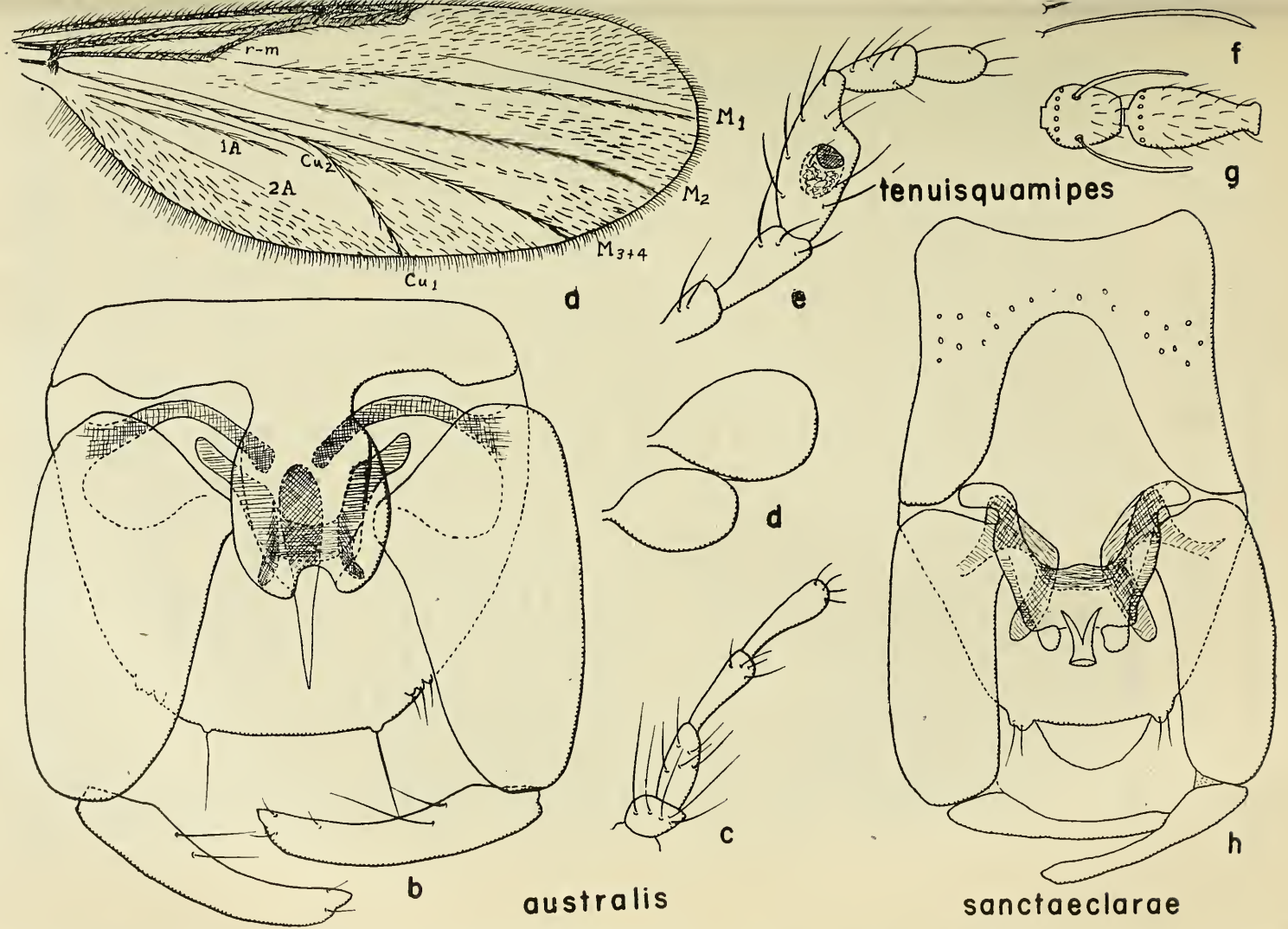


Fig. 1. Heleidae. *a-c, Dasyhelea australis; d-g, Forcipomyia tenuisquamipes; h, Forcipomyia* (*Thyridomyia*) *sanctaeclarae. a*, female wing; *b*, *h*, male genitalia, ventral view; *c*, *e*, female palpi; *d*, spermathecae, *f*, lanceolate scales on tibiae; *g*, tenth and eleventh antennal segments of female.

Subfamily DASYHELEINAE

Dasyhelea australis Wirth, new species (Figure 1, a-c)

♀. Length 2,25 mm., wing 1,9 mm. by 0,75 mm.

Head brownish black, including antennae and palpi. Eyes contiguous above, apparently bare. Proportions of antennal segments not measured; on dried specimens with flagellar segments ranging from as broad as long (III) to about 1,5 times longer than broad and short tapering (X), XI-XIV about 3 times longer than broad and long tapering, last segment about 4 times longer than broad and tapering to a slender terminal style. Palpi (figure 1, c) very slender, segments in proportion of 10 : 32 : 32 : 32, antepenultimate segment stout and hairy, without apparent sensory pit, penultimate and ultimate segments slender at bases with extreme apices expanded and hairy.

Mesonotum dull, dark brown, faintly mottled with blackish; humeri yellowish on extreme corners; vestiture of strong, erect black setae with two well defined acrostichal rows and two pairs of sublateral rows, with scattered setae on lateral margins. Scutellum blackish on middle third, dull yellowish on sides. Postscutellum and pleura dull brownish black. Legs dull brownish, slender, tibiae and hind tarsi with long, erect dorsal hairs; hind basitarsi 1,7 times as long as second segments.

Wing (figure 1, a) with costa reaching to 0,56 of wing length, anterior radial cells very narrow, the first appearing merely as a fold, the second narrower than breadth of vein R_{4+5}. Petiole of anterior media about as long as crossvein r-m, mediocubital fork located at level of base of second anterior radial cell. Macrotrichiae long and appressed, denser and more evenly distributed around wing margin, but restricted in definite lines with clear spaces between bordering the veins. Halteres with stems dark, ends of knobs whitish.

Abdomen dull blackish, with narrow, segmental, whitish bands at apices of tergites. Pleural membrane with black streaks consisting of integumental striations. Spermathecae two, subequal, ovoid. Last sternite before genital opening with a dense cluster of long hairs.

Male genitalia (figure 1, b). Ninth sternite very short, about six times as broad as long, with spiculose membrane, posterior margin in middle continued as a rounded, hyaline lobe covering aedeagus; ninth tergite 0,8 times as long as basal width, evenly rounded caudad, without apicolateral processes, a cluster of 3-4 strong setae on each side in the corresponding positions. Basistyles about 2,2 times as long as broad; dististyles about 0,7 times as long as basistyles, gently curved, quite stout to the bluntly pointed apices. Aedeagus with a transverse, yoke-shaped sclerite bearing a submedian pair of slender, caudo-ventrally directed lobes on posterior margin, the ventral surface covered with the posteriorly notched, hyaline lobe of the ninth sternite. Parameres symmetrical, with a pair of very slender basal sclerites and a straight, slender, distally fine pointed, median sclerite.

Holotype ♂, allotype, MASATIERRA, Bahía Cumberland, Grutas de los Patriotas, Feb. 19, 1951. Paratypes: 1 ♂, 1 ♀, same data as types; 1 ♂, Plazoleta del Yunque, 200 m., March 17, 1951; 1 ♀, MASAFUERA,

Inocentes Bajos, Jan. 27, 1952; 2 ♂♂, 2 ♀♀, Quebrada de las Casas, Jan. 19, 1952.

The pale markings are variable, some specimens having the halteres and scutellum entirely dark and practically no trace of the pale, distal, abdominal bands, but as there is no correlation with locality and since the structure of the male genitalia remains uniform, I do not hesitate to include all as paratypes.

D. australis belongs to what I (1952) have called the *cincta* group, whose species are characterized by large size, irregularly dappled mesonotum, long hairs on the wings usually arranged in lined, abdominal tergites with whitish apices, abdominal pleura with black streaks, usually three spermathecae, male genitalia with the ninth sternite produced in a rounded lobe over the aedeagus and the parameres usually symmetrical with a sharp-pointed median sclerite. *D. australis* is very closely related to *albopicta* Ingram and Macfie from the Chilean mainland, which it closely resembles in size and color but *albopicta* has a different male genitalia, in which the ninth sternite is longer with the posterior lobe evenly rounded and not notched distally, the aedeagus does not have basal sclerite so highly arched in the middle and the submedian posterior lobes are much longer, their free portions over half as long as the median sclerite of the parameres.

Family TENDIPEDIDAE (=Chironomidae)

Subfamily PODONOMINAE

Genus **Podonomus** Philippi

In many respects the Podonominae show close relationship with the Heleidae, particularly in the absence of a median furrow on the postscutellum, the resting position with the wings folded over each other on the back, the absence of vein R_{2+3} and the presence of lateral spines on the abdominal segments of the pupae. The genus *Podonomus* is very rich in species in southern South America, which seems to be the center of its distribution. Only a few species occur elsewhere, and one of these has a wide range, from Europe to North America, in Chile, and is also present in Father Kuschel's collection from Masafuera. The species now known from the Juan Fernández Islands may be separated by the following key.

Key to the Juan Fernández species of *Podonomus*:

1. Fourth tarsal segment simple; wing membrane with numerous macrotrichiae; male dististyle divided into two distal lobes by a deep, narrow cleft and bearing a long subapical seta.. 2

— Fourth tarsal segment produced in a whitish, membranous sole beneath base of fifth; wing membrane with scanty macrotrichiae; male dististyles simple or with widely separated distal lobes, without long subapical seta..... 4

2. Cell R_1 narrow, in middle not wider than basal width of cell R_5; male dististyle without lobelike basal expansion..... 3

— Cell R_1 broad, in middle at least twice as wide as basal width of cell R_5; male dististyle with broad, lobelike basal expansion ..... *nigrinus* Edwards

3. Female with cell R_1 not wider than twice the thickness of vein R_{4+5}; cell R_1 with macrotrichiae in anterior half; male dististyle long without strong spine on either distal lobe.... *kiefferi* (Garrett)

— Female with cell R_1 as wide as basal width of cell R_5; cell R_1 bare; male dististyle short with stout spine on apical lobe.... *selkirki* n. sp.

4. Eyes bare; palpi dark, third segment swollen; distal half of wing with sparse macrotrichiae on membrane; vein R_{4+5} straight; male dististyle bifid..... *kuschèli* n. sp.

— Eyes hairy; wing membrane bare; vein R_{4+5} slightly arched; male dististyle simple..... 5

5. Palpi and legs pale yellow; male dististyle rounded with sharp lateral lobe bearing a sharp spine..... *discistylus* n. sp.

— Palpi and legs brownish; male dististyle with acutely pointed apex bearing a blunt spine..... *acutus* n. sp.

Podonomus nigrinus Edwards (Figure 2, j)

Podonomus nigrinus Edwards, 1931, Dipt. Pat & S. Chile, pt. II, fasc. 5, p. 258 (Chile)

This species is readily distinguished by its relatively large size (wing 2,5 — 3,2 mm.) and blackish color; wing with long macrotrichiae over entire wing except in cell R_5 in female, and in cells R_5 to M_4 on distal half of wing in the male; vein R_1 much swollen in the female; cell R_1 broad; vein R_{4+5} downcurved at apex but ending short of wing tip; fourth tarsal segments without whitish, membranous, flattened soles, and male genitalia with the dististyles (figure 2, j) each with a tremendously expanded base and apex with two bare, rounded lobes. The present specimens differ somewhat from Edwards' figures in that the subapical lobe is more pointed and with a minute spine while the apical lobe is more roundly expanded with a strong spine as long as the breadth of the base of this lobe.

MASAFUERA: Inocentes Altos, 1.300 m., Jan. 22, 1952, 1 ♂; Inocentes Bajos 1.000 m., Jan. 27, 1952, 1 ♀; La Correspondencia, 1.300 m., Jan. 20, 1952, 1 ♂, 6 ♀♀; Quebrada de las Vacas, Jan. 17, 1952, 1 ♀.

Podonomus kiefferi (Garrett) (Figure 2, i)

Paratanypus kiefferi Garrett, 1925, Seventy New Diptera, p. 8 (British Columbia)
Podonomus peregrinus Edwards, 1929, Trans. Ent. Soc. Lond. 77 : 296 (Europe); Edwards, 1931, Dipt. Pat. & S. Chile, pt. II, fasc. 5, p. 256 (Chile; fig. ♂ gen.)
Podonomus kiefferi, Edwards, 1937, Int. Revue ges. Hydrobiologie u. Hydrographie 35 : 101 (synonymy; discussion)

MASAFUERA: La Correspondencia, 1.300 m., Jan. 20, 1952, 1 ♂. The genitalia (figure 2, i) of this male agree closely with Edwards' figure of *peregrinus*. In this species the eyes are bare, the female antennae 12-segmented, tibial spurs short, front basitarsi 0,55 times as long as tibiae, fourth tarsal segments simple, wing with dense macrotrichiae over all of membrane; cell R_1 narrow and hairy and vein R_{4+5} long and downscurved at apex.

Podonomus selkirki Wirth, new species (Figure 2, h)

♂ ♀. Length about 1,6 mm., wing 1,5 mm. by 0,63 mm.

Head dark brown including antennae and palpi. Proportions of antennae and palpi not measured. Eyes not examined for pubescence. Thorax subshining dark brown with grayish pollen. Halteres dark brown. Legs brown, including tarsi. Fore and mid tibiae each with one long spur, hind tibiae with a comb, a long spur and a short spur; fore basitarsi 0,73 times as long as tibiae; second and third tarsal segments distinctly swollen on mid legs; fourth tarsal segments shorter than fifth and subcylindrical, not cordate, and lacking a flattened, ventral sole.

Wing yellowish at base, veins brownish and membrane grayish hyaline; macrotrichiae long, densely covering membrane except in anterior basal cell and cell R_2. Costa extending well beyond tip of vein R_{4+5} to wing tip; vein R_1 thickened in female, 0,43 times as long as vein R_{4+5}; cell R_1 very narrow in male, about twice as wide as thickness of vein R_{4+5}, in female greatest width not greater than basal width of cell R_5. Vein R_{4+5} almost parallel to vein R_1 and costa, its apex markedly curved down and ending practically at wing tip in female, at 0,9 of wing length in male.

Male genitalia (figure 2, h). Basistyles gradually tapered and curved from bases, the dorso-mesal surfaces with numerous, moderately long hairs. Dististyles long and slender, their bases not expanded, each with apex bifid, the two lobes both rounded, the subapical one a little more slender and bearing a minute seta, the apical lobe stouter and bearing a stout, pointed spine about as long as width of lobe; a long, stout, dorsal seta at mid length of dististyle.

Holotype ♂, allotype, MASAFUERA, Inocentes Bajos, 1.000 m., Jan. 27, 1952. Paratypes, MASATIERRA: 1 ♂, Miradero de Selkirk, 550 m., Dec. 31, 1952; 1 ♂, El Yunque, 915 m., Feb. 10, 1952.

This species is named in memory of Alexander Selkirk, prototype of the hero of Defoe's great novel «Robinson Crusoe», who spent the years 1704-1709 on Masatierra and gave his name to one of the localities listed above. *P. selkirki* closely resembles *kiefferi* (Garrett) in having wing cell R_1 narrow and the male dististyle deeply bilobed, but *kiefferi* has cell R_1 narrower in the female, with macrotrichiae present in the anterior half of the cell, and the male dististyle are much shorter with a much longer and more slender apical lobe, neither lobe bearing a strong spine.

Podonomus kuscheli Wirth, new species (Figure 2, a-d)

♂ ♀. Length about 1,2 mm., wing 1,3 mm. by 0,52 mm.

Head dark brown including antennae and palpi. Eyes bare. Female antennae 10-segmented, flagellar segments in proportion of 18 : 15 : 13 : 11 : 10 : 10 : 10 : 12 : 30, last segment broad and clavate (figure 2, d).

Male antennae with last two segments as long as preceding four combined forming a slight club; last segment oval, 0,7 times as long as the penultimate and without long hairs. Third palpal segment swollen.

Thorax dark brown, subshining above, with sparse gray pollen. Acrostichal and dorsocentral hairs uniserial, dark. Legs yellowish in the female, pale brown in the male. Fore basitarsi 0,6 times as long as tibiae, fore tibial spurs long and single, mid tibiae with two moderate and subequal spurs; hind tibiae with very unequal spurs and a comb, the inner spur half again as long as diameter of tibia. Fourth tarsal segments (figure 2, c) with distal membranous sole, appearing conspicuously white by reflected light in dried specimens.

Wings grayish, the veins scarcely darker, crossveins occasionally obscurely whitish. Costa produced well past tip of vein R_{4+5} to wing tip; cell R_1 broad, without macrotrichiae; vein R_{4+5} straight. Female wing (figure 2, a) with vein R_1 swollen toward apex; sparse macrotrichiae on distal half of all veins and a few in a row in distal half of cells R_5, M_2, and anal cell. Male wing bare except a few macrotrichiae along base of radius and three or four at end of vein M_{1+2}. Halteres dull yellowish.

Abdomen dull dark brown, with short hairs. Male genitalia (figure 2, b) with ninth tergite bluntly conical and bearing about a dozen long hairs. Basistyles stout at bases, each abruptly narrowed on distal half, without strong hairs on mesal surface. Dististyles not strongly expanded at bases but each with a strong, bare, triangular, subapical tooth and a similar apical tooth bearing a yellowish, stout, peg-like spine of about the same length; with the usual long hairs but without any strongly differentiated subapical seta.

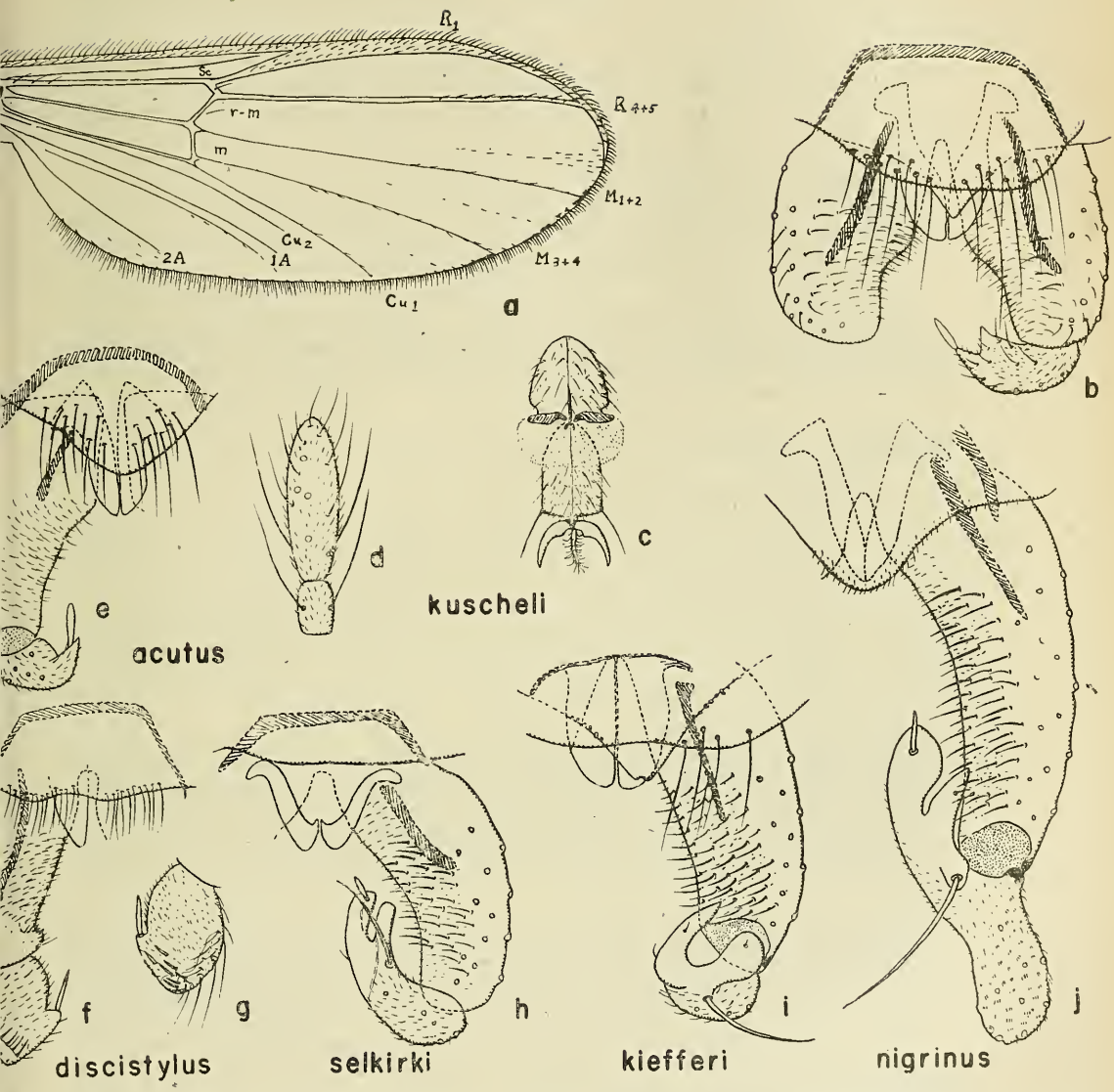
Holotype ♂, allotype, MASAFUERA, Quebrada de las Vacas, Jan. 17, 1952. Paratypes: 8 ♂♂, 3 ♀♀, same data as types, 5♂♂, 1 ♀, Quebrada de las Casas, Jan. 19, 1952; 1 ♂, Inocentes Altos, 1.300 m., Jan. 22, 1952.

This species is named in honor of its collector, the Rev. P. Guillermo Kuschel of the Universidad de Chile, to whom I am greatly indebted for the opportunity to study this interesting collection of midges. *P. kuscheli* is very closely related to the Chilean *decarthrus* Edwards, which however has hairier wings (females), a leg ratio of 0,5 and the male dististyles with a strongly differentiated subapical seta. Some of the present specimens have an indication of whitish crossveins as in the Chilean *albinervis* Edwards, but that species lacks the subapical tooth on the male dististyles.

Podonomus discistylus Wirth, new species (Figure 2, f, g)

♂ ♀. Length about 1,2 mm., wing 1,2 mm. by 0,5 mm.

Head dark brown, including antennae; palpi pale yellow. Eyes with dense interfacetal hairs. Female antennae 10-segmented, flagellar segments in proportion of 20 : 15 : 12 : 10 : 10 - 10 : 10 : 10 : 35, last segment clavate. Palpi with third segment very slender. Thorax brown with gray pollen, scutellum paler. Legs yellowish, slightly brownish in male. Fore and mid tibiae each with one short spur; hind tibiae each with a comb and one long and one short spur. Fore basitarsi 0,6 times as long as tibiae, fourth tarsal segments each with a white, flattened, membranous sole; fifth segments slightly longer than fourth, third 0,75 times as long as fourth and fifth together.



2. Tendipedidae, *Podonomus* species. *a-d, kuscheli;* e, *acutus;* f, *g, discistylus; h, selkirki; i, kiefferi; j, nigrinus. a,* le wing; *b, c, f, h, i, j,* male genitalia, dorsal view; *c,* fourth and fifth tarsal segments, ventral view; *d,* last two antennal segments of female; *g,* male dististyle.

Wing pale at base, anterior veins pale; membrane grayish hyaline. Macrotrichiae absent on membrane, a few on veins R_1 and R_{4+5} and apices of posterior veins. Cell R_1 and R_{4+5} longer than in *kuscheli* and slightly downcurved at tip.

Male genitalia (figure 2 f, g). Basistyles short and stout, not swollen at bases; extreme apices each with a small mesal papillose lobe. Dististyles disciform, each with small, pointed, mesal lobe bearing a long, pointed spine; extreme distal margin of dististyle thickened and bearing about half a dozen short, strong setae.

Holotype ♂. MASAFUERA, Quebrada de las Casas, Jan. 19, 1952. Allotype, Inocentes Bajos, Jan. 27, 1952. Paratypes: 5 ♂♂, same data as holotype; 1 ♀, Quebrada de las Vacas, Jan. 17, 1952; MASATIERRA: 1 ♀ Miradero de Selkirk, 550 m., Dec. 31, 1952.

This species superficially closely resembles *P. kuscheli* n. sp. but can be readily distinguished by the hairy eyes, slender, pale yellow palpi, absence of macrotrichiae on the wing membrane and vein R_{4+5} slightly downcurved at the tip and by the very distinctive, disciform male dististyles.

Podonomus acutus Wirth, new species (Figure 2, e)

♂. Wing 1,2 mm. by 0,37 mm.

Head and body dark brown with grayish pollen. Palpi brown. Antennae lacking. Eyes not examined under high power. Legs brown, including tarsi; fourth tarsal segments each with whitish, flattened, membranous sole. Fore basitarsi 0,58 times as long as tibiae. Wing pale at base, veins brownish, membrane grayish hyaline. Macrotrichiae apparently absent although wing has been rubbed. Costa extending well past apex of vein R_{4+5} to wing tip; cell R_1 broad, vein R_{4+5} nearly straight, apex very slightly downcurved. Halteres brownish.

Male genitalia (figure 2, e). Basistyles with bases broad, abruptly narrowed before middle and tapered to apices, mesal surfaces with very fine hairs. Dististyles with bases not expanded, each abruptly narrowed just past middle to an acute, pointed apex bearing a long, peg-like subterminal spine nearly as long as basal width of dististyle.

Holotype ♂, MASAFUERA, La Correspondencia, 1.300 m., Jan. 20, 1952.

Although the single male is badly rubbed and the antennae are lacking, the distinctive male dististyle with acute apex bearing a long, peglike spine will permit future recognition of this species which apparently belongs close to *P. albinervis* Edwards from Chile.

Subfamily PELOPIINAE (=TANYPODINAE)

Anatopynia vittigera Edwards

Anatopynia vittigera Edwards, 1931, Dipt. Pat. & S. Chile, pt. II, fasc. 5, p. 242 (Chile)

MASAFUERA: 1 ♂, Inocentes Bajos, 1.000 m., Jan. 27, 1952, P. G. Kuschel; 1 ♀, Quebrada de las Casas, Jan. 19, 1952.

These specimens fit Edwards' description of *vittigera* very well except that the mesonotal markings are somewhat lighter than Edwards

states, the three mesonotal bands being brown rather than blackish and the space between yellowish rather than brownish. The mid femora of the present female are also nearly all brown.

Subfamily CLUNIONINAE (=Campontiinae)

Clunio fuscipennis Wirth, new species (Figure 3, a-d)

♂. Length about 1,5 mm., wing 1,3 mm. by 0,6 mm.

Thorax and genitalia subshining dark brownish black, whitish pruinose in certain lights. Antennae, scutellum, legs, and halteres dull grayish white; wings opaque, smoky, grayish brown; abdominal segments dark brown, apices of segments with broad pale bands.

Eyes with dense, long, interfacetal hairs. Antennae (figure 3, a) with flagellar segments in proportion of 50 : 12 : 11 : 10 : 10 : 10 : 10 : 9 : 70, end of first flagellar segment and most of the seven preapical segments deeply infuscated, apical segment pale, its length 0,87 that of preceding seven combined. Palpi one-segmented, pale, with two fine subapical pale hairs.

Mesonotum rather slender, about 1,4 times longer than broad and very convex, especially in front; about 4 setae in each submedian row and 2 in each supraalar series. Legs with proportions of segments as follows:

	Cx.	Tr.	F	Ti	T_1	T_2	T_3	T_4	T_5
Fore ...	40	35	90	140	40	14	14	14	20
Mid....	50	25	130	130	25	12	12	12	20
Hind ...	50	25	140	140	30	10	20	10	20

Apical spurs present and small on all tibiae, those on mid and hind pairs slightly bent at apices (figure 3 b). Coxae and trochanters dark brown, concolorous with thorax, articulations between all segments of legs deeply infuscated, broadly at bases of tibiae; ventral sides of tarsal segments 2-5 on fore and mid legs, and 2, 4, and 5 on hind legs also brownish.

Wing (figure 3, c) with four or five small setae on R; vein R_1 about a third as long as R_s, the latter nearly straight; costa to 0,84 of wing length measured from basal arculus. Vein M_1 straight, base of mediocubital fork located at level of apex of crossvein r-m, M_{3+4} nearly straight, Cu_1 gently curved and meeting wing margin at an angle of about 105 degrees on proximal side.

Male genitalia about 1,5 times as long as broad; basistyles fused only at extreme bases, the details of their mesal apices, the lips of the genital opening and the parameres (figure 3, d) very similar to those figured for *schmitii* Stone and Wirth (1947) except that ninth tergite does not protrude between disto-mesal margins of basistyles nearly so much.

♀. Length about 2,0 mm. Color yellowish white, most of the legs and genitalia sclerotized brownish; thorax and abdomen with scattered areas of faint bluish-black pigment. In structure closely resembling females of other species of *Clunio* (c. f. Stone and Wirth, 1947). Antennae apparently 4-segmented, the distal segment about three times as long

as basal breadth, somewhat tapering toward apex. Legs with all of coxae and trochanters, broad apices of femora and bases of tibiae, narrow apices of tibiae, and all of tarsi sclerotized dark brown.

Holotype ♂, allotype, MASAFUERA, Quebrada de las Casas — Playa, Jan. 25, 1952. Paratypes: 24 ♂♂, same data as types; 6 ♂♂, MASATIERRA, Bahía Cumberland, March 8, 1951. According to the collector, Father Kuschel, this species was «found at low tide dancing by thousands on stones overgrown with fine little green algae».

The somewhat shining, blackish colored, narrow mesonotum and genitalia and the distinctly smoky brown wings will distinguish *fuscipennis* from all other known species of *Clunio*, which are usually lighter in color with milky white wings. In this respect the present species is much more typical of other genera of Clunioninae. In our key (Stone and Wirth, 1947) this species will key out closer to the second half of couplet 6, but it has a much longer distal antennal segment than either *setoensis* Tokunaga (Japan) or *marshalli* Stone and Wirth (Florida). The male genitalia are close to those of *schmitti* from the Galapagos Islands, which however has bare eyes and a very short distal antennal segment. *Clunio brasiliensis* Oliveira (1952) from Brazil has the male antenna equal to the preceding six segments combined, the wings are white and lack the connection between veins R_1 and R_5; vein M_1 is much upcurved at the apex, and the male parameres are shaped differently.

Subfamily HYDROBAENINAE (=ORTHOCLADIINAE)

Hydrobaenus (Smittia) pratorum (Goetghebuer) (Figure 3, g)

Camptocladius pratorum Goetghebuer, 1927, Ann. Biol. Lacustre 15 : 101
Spaniotoma (Smittia) pratorum, Edwards, 1929, Trans. Ent. Soc. London 77 : 361 (England), 1931, Dipt. Pat. & S. Chile, Pt. II, fasc. 5. p. 296. (Patagonia)
Hydrobaenus (Smittia) pratorum Coe, 1950, Handb. Ident. Br.Ins. 9 (2) : 165 (England)

MASATIERRA: Bahía Cumberland, March 1, 1951, 1 ♂, 1 ♀; Grutas de los Patriotas, Bahía Cumberland, Feb. 19, 1951, 1 ♂. MASAFUERA, Quebrada de las Casas, Jan. 19, 1952, 3 ♂♂.

According to the diagnoses by Edwards and Coe cited above, this species can be recognized by its dull black color, including halteres and squama; eyes and squama bare; wings whitish in both sexes including veins, costa very much produced, anal lobe obtuse, basal half of mediocubital fork narrow with Cu_1 strongly bent in middle, Cu_2 reaching well beyond the fork; wing length 1,2 — 3 mm.; male genitalia (figure 3, g) with large basal lobe and long anal point. The present specimens agree very well except that in the males the wings are not whitish but grayish hyaline with the veins brownish. I have been able to verify this by comparing the present specimens with a male and female from England determined by Edwards and deposited in the National Museum collection.

Hydrobaenus (Limnophyes) pusillus (Eaton)

Limnophyes pusillus Eaton, 1875, Ent. Mo. Mag. 12 : 60 (Kerguelen Id.)
Spaniotoma (Limnophyes) pusillus, Edwards, 1929, Trans. Ent. Soc. Lond. 77 : 355 (England); Edwards, 1931, Dipt. Pat. & S. Chile, pt. II, fasc. 5, p. 292
Hydrobaenus (Limnophyes) pusillus, Coe, Handb. Ident. Brit. Ins. 9 (2) : 163 (England)

MASATIERRA: Bahía Cumberland, Feb. 24, 1951, 3 ♀♀.

This species, which is the type of the subgenus *Limnophyes*, may be readily recognized by the yellowish mesonotum with brownish bands in the female, mesonotum uniformly blackish in the male, dorsocentral hairs pale, uniserial, no scales on mesonotum; squama usually with two or three hairs, wing length 1.8 — 2 mm., wing grayish, halteres yellow.

Hydrobaenus (Limnophyes) fernandezensis Wirth, new species (Figure 3 e, f)

♂♀. Length about 1,6 mm., wing 1,4 mm. by 0,45 mm.

Head dark brown including antennae and palpi. Eyes bare. Antennae of female six-segmented, segments in proportion of 20 : 25 : 25 : 30 : 30 : 35, last segment (figure 3, e) oval with five strong basal verticils and a long subapical seta. Male antennae with very long, stiff, black plumes, with verticils decreasing in size toward apex but distal ones a fifth as long as basal ones; last segment as long as preceding seven combined or 0,64 as long as remaining thirteen segments of flagellum. Female palpi as long as antennae, segments slender, in proportion of 15 : 36 : 32 : 55.

Thorax shining dark brown, almost black in the male. Legs and halteres dark brown. Dorsocentral hairs biseriate, fairly long and blackish. Fore basitarsi 0,77 as long as tibiae; hairs on legs rather coarse and erect; fourth tarsal segments subequal to fifth. Wing dark grayish hyaline, the veins brownish infuscated, microtrichiae well developed. Mediocubital fork located past r-m by width of cell M_2 at level of r-m, the fork narrow at base but distal third of Cu_1 abruptly curved down to wing margin.

Abdomen blackish, in male with long, erect hairs. Male genitalia (figure 3, f) much broader than preceding segments. Anal point very prominent, nearly as long as dististyles, somewhat variable in shape with middle swollen and tip pointed in some specimens, or with apex broadest and blunt in others, always very hairy. Basistyles stout, each with acute basal lobe bearing long pubescence. Dististyles slender at bases, each with a blackish, pointed, bare, dorsal spur and a long blunt apical spine, outer and inner margins densely pubescent. Ventral side of genitalia between bases of basistyles with a long, slender, pubescent, median lobe (? penis lobe) reaching to level of basal lobes of basistyles.

Holotype ♂, allotype, MASATIERRA, Miradero de Selkirk, 550 m., Dec. 31, 1951. Paratypes: 2 ♂♂, 3 ♀♀, same data as types; 1 ♂, El Yunque, 915 m., Feb. 10, 1952; 2 ♂♂, 2 ♀♀, Plazoleta del Yunque, 200 m., Feb. 20, 1951; 2 ♂♂, 1 ♀, El Rabanal, 450 m., Feb. 27, 1951; 1 ♂, Cerro Alto, 600 m., Feb. 1, 1952; 1 ♀, Alto Francés, 550 m., Mar. 7, 1951; 1 ♀, Grutas de los Patriotas, Bahía Cumberland, Feb. 19, 1951. MASAFUERA: 1 ♂, 1 ♀, Inocentes Bajos, 1.000 m., Jan. 27, 1952; 1 ♀, La Correspondencia, 1.300 m., Jan. 20, 1952; 2 ♂♂, 1 ♀, Quebrada de las Casas, Jan. 19, 1952; 1 ♀, Quebrada de las Vacas, Jan. 17, 1952.

This species is related to *H. collaris* (Edwards) from Chile which it resembles in color, male antennal plumes, wing venation and the shape of the basal lobes and dististyles of the male genitalia, but *collaris* is larger (2 mm.) and has only a short anal point on the male genitalia, the antennal ratio is 0,3 and the front leg ratio is 0,6.

Subfamily TENDIPEDINAE (=Chironominae)

Tanytarsus (Tanytarsus) flavipes (Meigen) (Figure 3, h)

Chironomus flavipes Meigen, 1818, Syst. Beschr. 1 :.50 (Europe)
Pentapedilum (Phaenopsectra) flavipes, Edwards, 1929, Trans. Ent. Soc. Lond. 77 : 375 (England)
Chironomus (Phaenopsectra) flavipes, Edwards, 1931, Dipt. Pat. & S. Chile, Pt. II, fasc. 5, p. 314 (Chile)
Tanytarsus (Tanytarsus) flavipes, Townes, 1945, Amer. Midl. Nat. 34 : 76 (North America)

Masafuera: Quebrada de las Vacas, Jan. 17, 1952, 6 ♂♂, 3 ♀♀; Inocentes Bajos, 1.000 m., Jan. 27, 1952, 1 ♂, 1 ♀; La Correspondencia, 1.300 m., Jan. 20, 1952, 1 ♂, 1 ♀.

This species may be distinguished by the following characters: wings with macrotrichiae on the membrane; medial crossvein absent but crossvein r-m present, oblique and pale; squamae fringed; anterior tibiae with apical, interior, triangular scale with minute spine; combs on mid and hind tibiae contiguous with a single, long, slender, spine; body black; wings dull yellowish; legs pale yellow, the ends of femora and tarsi brownish; palpi brownish; male genitalia (figure 3, h) with dististyles directed immovably caudad, longer than basistyles and broad; superior appendages horn-shaped with expanded, setose bases and each with a long subapical hair; inferior appendages long and spatulate with distal halves bearing numerous retorse setae and each with two long whip-like distal hairs; ninth tergite long and narrowly rounded with a distal row of long, uniform hairs; anal point long and slender.

The present specimens are slightly smaller (wing 2,25 mm. long) than reported by previous authors (wing 2,9 — 5 mm.) and the ninth tergite on four of the five males examined was much longer and narrower than that figured by Townes. The legs vary in color and may be darker than Northern Hemisphere specimens as indicated by Edwards for Chilean specimens. In several of the present specimens the entire tarsi were distinctly brownish.

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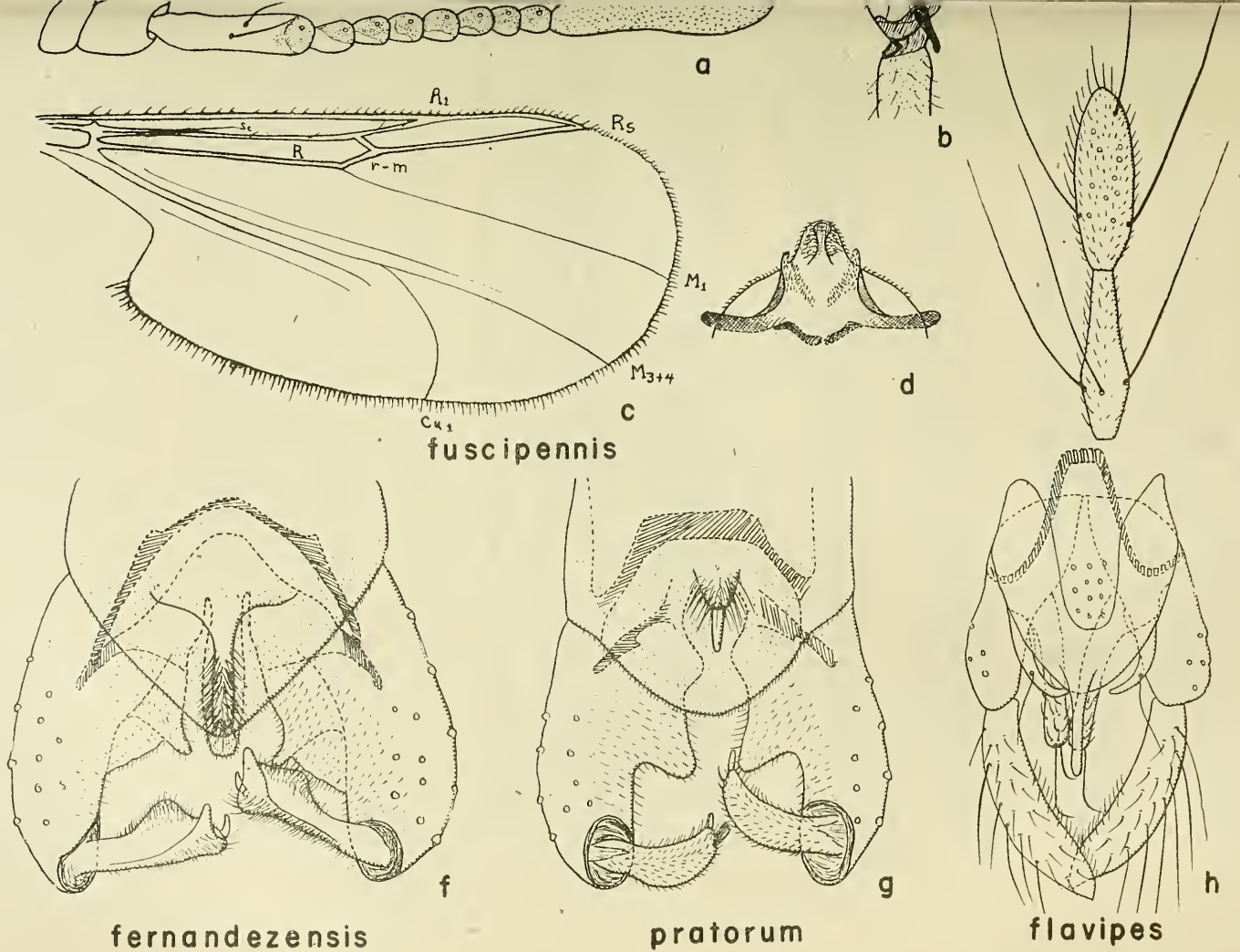

Fig. 3. Tendipedidae. *a-d, Clunio fuscipennis; e, f, Hydrobaenus* (*Limnophyes*) *fernandezensis; g, Hydrobaenus* (*Smittia*) *pratorum; h, Tanytarsus flavipes. a,* male antenna, *b,* end of hind tibia of male; *c,* male wing; *d,* genital opening of male; *e,* last two antennal segments of female; *f-h,* male genitalia, dorsal view.

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