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Notes on the Tropical American Species of Tipulidae (Diptera) VIII. Subfamily Tipulinae

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(With 70 figures)

In the preceding number of the present series of reports (*Studia Entomologica,* 10: 277-352, 78 figs.; 1967) a list of the hitherto published parts was provided, all having appeared in the *Revista de Entomologia* between 1945 and 1951. In this number it was indicated that a concluding report would be prepared to include the subfamily Tipulinae and so complete the record of species in the family for the Neotropical region. At approximately the date of the present report a contribution by Charles P. and Mabel M. Alexander should be published as Fascicle 4 of «*A Catalogue of the Diptera of the Americas south of the United States*», sponsored by the Departamento de Zoologia, Secretaria da Agricultura, São Paulo, Brasil. This volume provides bibliographic references to the more than 3,000 Neotropical species of Tipulidae presently known and it is believed that the bibliographic references included, used in conjunction with the present series of *Notes,* will prove of service to future workers on this extensive and involved family of Diptera.

The present paper includes a discussion of the subfamily Tipulinae, an extensive array of species, including the larger members of the family. Recent studies on the more primitive Tipuline genera, especially those made in Australia by Dr. N. Dobrotworsky, in England by Mr. Richard I. Vane-Wright, and by the present writer, have necessitated some significant changes in the hitherto accepted nomenclature and distribution of genera in the subfamily.

At about 1930 it was realized that in the great genus *Limonia* Meigen, in the subfamily Limoniinae, a marked reduction in the number of supposed distinct related genera was necessary and many of these were relegated to subgeneric rank under *Limonia* or were placed in the synonymy, as was discussed in Parts VI and VII of the present series of *Notes* and in a companion

report by the writer (Philippine Jour. Sci., 93: 427-433; 1964). More recently it has become apparent that a comparable consolidation of names was advisable in the subfamily Tipulinae and a preliminary discussion, as it concerned the genus *Ctenophora* Meigen, was provided by the writer (Philippine Jour. Sci., 83: 264-265; 1954). As indicated above, recent studies by Dobrotworsky and Vane-Wright are of primary importance in this consideration, as discussed later in this paper.

In this report a considerable proportion of the included genera pertain to the so-called primitive Tipulinae, the remainder being what apparently are more specialized, such as *Ctenophora* Meigen, *Dolichopeza* Curtis, *Nephrotoma* Meigen, and *Tipula* Linnaeus. The generalized type of wing venation is shown in *Megistocera* Wiedemann (Fig. 2) where vein Sc_1 is strongly preserved and the free tip of Sc_2 lies far proximad, at the wing margin being confluent or virtually so with the thickened apex of Sc_1 to close the narrowed cell Sc_1. The continuing vein R_1 longitudinally bisects the stigma as a pale element, joining the very short R_2 at the distal end of the stigma. *Brachypremna* Osten Sacken (Fig. 1) is similar but has the free tip of Sc_2 more distal, a condition that is even more accentuated in the remaining genera of the subfamily, as shown in the various figures.

The generic, subgeneric and species names are arranged alphabetically for ease of reference.

Brachypremna Osten Sacken
Ctenophora Meigen
Dolichopeza Curtis
    Subgenus *Megistomastix* Alexander
Elnoretta Alexander
Holorusia Loew
Ischnotoma Skuse
    Icriomastax Enderlein
    Ischnotoma Skuse
    Neotipula Alexander
Leptotarsus Guérin-Méneville
    Aldrovandia Enderlein
    Araucomyia Alexander
    Ceoneura Alexander
    Leptotarsus Guérin-Méneville
    Limoniodes Alexander
    Longurio Loew
    Pehlkea Enderlein
    Tanypremna Osten Sacken
    Tanypremnella Alexander
    Tanypremnodes Alexander
    Xenotipula Alexander

Megistocera Wiedemann
Nephrotoma Meigen
Ozodicera Macquart
Dihexaclonus Enderlein
Ozodicera Macquart
Phacelodocera Enderlein
Tipula Linnaeus
Bellardina Edwards
Eumicrotipula Alexander
Lunatipula Edwards
Microtipula Alexander
Pectinotipula Alexander
Pterelachisus Rondani
Trichotipula Alexander
Triplicitipula Alexander
Yamatotipula Matsumura
Valdiviana Alexander
Zelandotipula Alexander

Brachypremna Osten Sacken

Brachypremna Osten Sacken; Berlin. Ent. Zeitschr., 30: 161; 1886; (type *dispellens* Walker, designated by Coquillett, 1910, as *dispellans*).
Brachypremna Alexander; Jour. N. Y. Ent. Soc., 20: 225-226, 1 fig., pl. (with 6 figs.); 1912.

Brachypremna is an essentially Neotropical genus with a single widespread species (*dispellens*) that extends into the eastern United States. Two further species are Australasian, these being *B. tigriventris* Alexander, of north Queensland and *B. waigeuensis* Alexander, of the Papuan subregion. Three fossil species from the lower Tertiary have been described that should be discussed as to their possible affinities with *Brachypremna* and with *Megistocera* Wiedemann, as considered later. *Megistocera gurnetensis* Cockerell (Ann. Mag. Nat. Hist., ser. 9, 7: 456, fig., wing; 1921) appears to be a member of the present genus but may pertain to *Megistocera.* It was described from the Gurnet Bay beds in the Isle of Wight, considered as being Oligocene. The species described as *Macromastix bornhardti* Meunier, from Baltic Amber (Upper Eocene) very probably belongs to the genus *Megistocera,* as mentioned under that genus. The greatly lengthened male antennae and general structure of the hypopygium support this reference, since the conditions are not unlike those found in the recent Old World *Megistocera filipes* (Fabricius). All known species of the present genus have the antennae very short in both sexes. The type was re-examined by the writer and was further discussed and figured under the name *Macromastix bornhardti* (Bernstein-Forschungen, Amber Studies, 2: 19-21, fig.

4 [wing], fig. 5 [male hypopygium]; 1931). The third fossil species, described by Meunier as *Brachypremna eocenica,* 1906, from Baltic Amber, evidently does not belong to this genus and was further described and figured by the writer as *Tipula eocenica* (l. c., 1931: 34).

The general morphology of the adult flies of *Brachypremna* has been discussed in the Alexander 1912 paper cited above. The general features are mentioned briefly at this time. Nasus conspicuous. Antennae (Figs. 3, 4) shorter than the maxillary palpi, commonly 11-segmented, in cases with 10 segments. Eyes with ommatidia small and very numerous, as in *Megistocera* and virtually all other genera in the primitive Tipulinae. Wings (Fig. 1, *Brachypremna illudens*) with vein Sc_2+R_1 longer than the free tip of Sc_2, the latter a short distance beyond Sc_1 and not closing the cell; vein R_{4-5} elongate in all species excepting *B. unicolor* where it is in longitudinal alignment with *Rs* and with *r-m* distinct; cell *2nd A* very narrow. Veins M_2, M_3 and M_4 at or close to the wing margin narrowly whitened. Male hypopygium (Figs. 6, 7) with the clavate outer dististyle inserted on lower margin of the larger inner style, with a small tubercle or spine on outer margin of style at this point. The whitening at the tips of the outer medial veins, as described, should be emphasized. It occurs in all Neotropical species and also in the two Australasian forms above mentioned. It similarly occurs in species of *Megistocera* and emphasizes the relationship between these two genera.

The immature stages are poorly known. The pupa has been found in rotting moist logs, a very different habitat from that of *Megistocera* (Alexander, Crane- flies of New York, Part II, pp. 984-985, figs. 474-477 [details of pupa]; 1920).

List of Species

abitaguae Alexander. — Ecuador.
(*albimana* Wiedemann, see *candida*)
angusta Alexander. — Brazil.
appendigera Alexander. — Ecuador, Peru.
arajuno Alexander. — Ecuador.
arcuaria arcuaria Alexander. — Ecuador.
a. triangularis Alexander. — Venezuela.
australis Alexander. — Argentina.
basilica Alexander. — Peru.
brevigenua Alexander. — Brazil.
breviterebra Alexander. — Brazil.
breviventris (Wiedemann, as *Tipula*). — Bolivia, Brazil, British Guiana, Peru, Surinam, Venezuela.

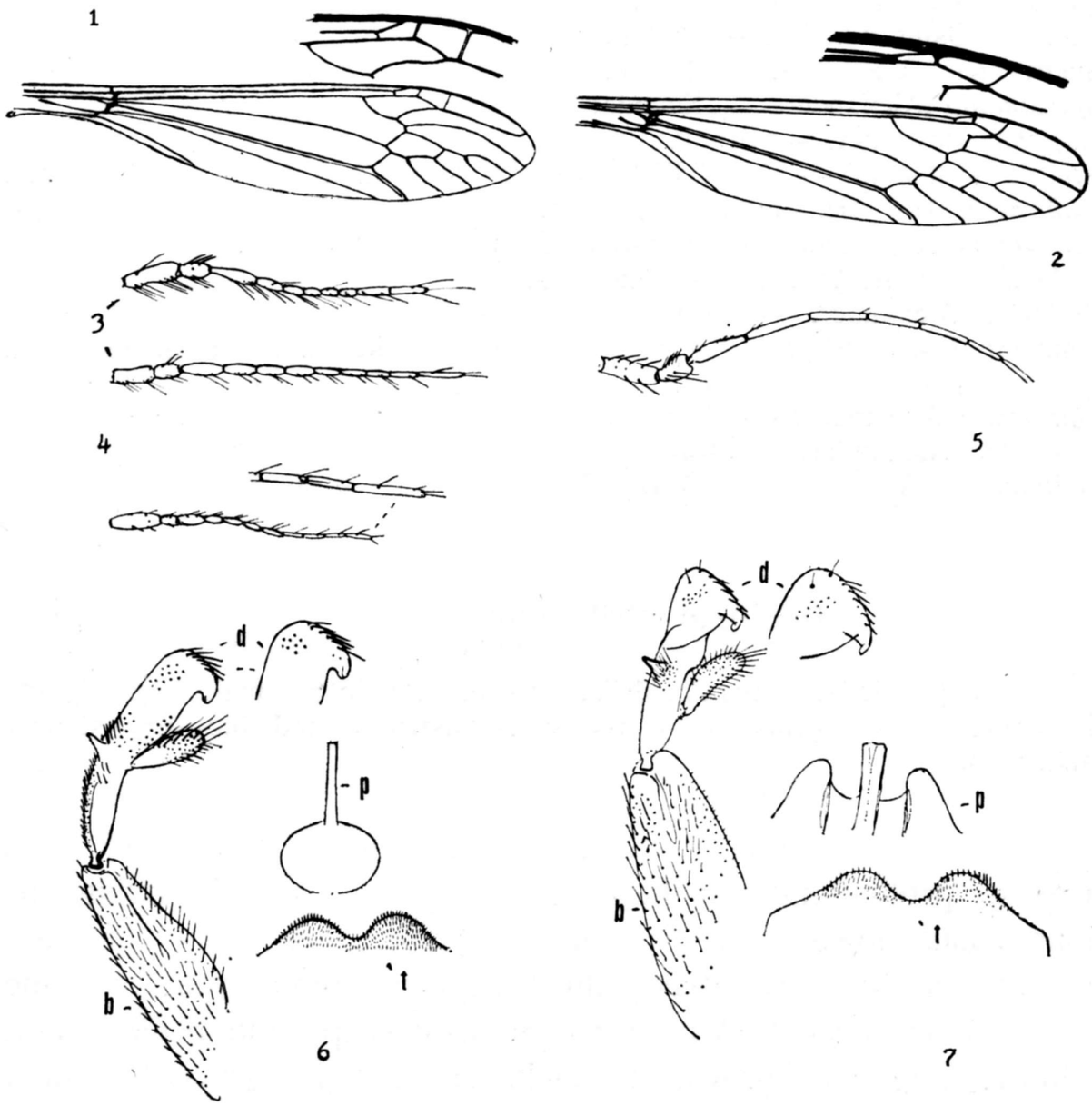

Fig. 1. *Brachypremna illudens* Alexander; venation. — Fig. 2. *Megistocera longipennis* (Macquart); venation. — Fig. 3. *Brachypremna arcuaria* Alexander; male antenna. — Fig. 4. *Brachypremna dispellens* (Walker); male antenna, two. — Fig. 5. *Megistocera longipennis* (Macquart); male antenna. — Fig. 6. *Brachypremna candidella* sp. n.; male hypopygium. — Fig. 7. *Brachypremna candida* Alexander; male hypopygium. — Symbols: *b*, basistyle; *d*, dististyle; *p*, phallosome; *t*, tergite.

candida Alexander. — re-naming of *albimana* (Wiedemann), nec *albimana* (Fabricius). — Brazil, Ecuador, Panama, Peru, Surinam.
candidella sp. n. — Peru.
clymene Alexander. — Brazil.
dispellens (Walker, as *Tipula*). — Brazil, Costa Rica, Guatemala, Mexico, Panama, Surinam, Venezuela; Trinidad; Eastern United States.
diversipes Alexander. — Peru.
geijskesi Alexander. — Surinam.
illudens Alexander. — Peru.
integristigma Alexander. — Brazil.
itatiayana Alexander. — Brazil.
karma Alexander. — Ecuador.
laetiventris Alexander. — Venezuela.
nigrofemorata Alexander. — Brazil.

phrixus Alexander. — Ecuador.
pictipes Osten Sacken. — Brazil.
pictiventris Alexander. — Brazil.
quasimodo Alexander. — Ecuador.
sappho Alexander. — Brazil.
similis Williston. — Costa Rica, Mexico, Nicaragua, Panama, Venezuela.
subevanescens Alexander. — Bolivia.
subsimilis Alexander. — Argentina, Brazil.
subuniformis Alexander. — Venezuela.
thyestes Alexander. — Peru.
unicolor Osten Sacken. — Cuba, Dominican Republic, Haiti, Grenada, Jamaica, Puerto Rico.
uniformis Alexander. — Brazil, Peru.
variitibia Alexander. — Brazil.
williamsoni Alexander. — Brazil, British Guiana, Peru, Surinam.

Brachypremna candidella sp. n.

Closely allied to *candida,* differing especially in the male hypopygium, including the conformation of the inner dististyle and the very slender aedeagus.

Male. — Length, about 11-12 mm.; wing, 13-15 mm. Frontal prolongation of head light yellow above, including the long nasus, lower half dark brown; proximal segments of palpi brown, the incisures pale, third segment more yellowed, the terminal one dark brown. Antennae with scape and pedicel light yellow; flagellum brownish black. Head light grayish brown; anterior vertex from about equal to nearly twice the diameter of the scape.

Pronotum obscure yellow. Mesonotal praescutum obscure yellow with four light cinnamon brown stripes that are narrowly bordered by slightly darker brown; posterior sclerites of notum light brown. Pleura yellowed, without pattern. Halteres with stem whitened, the small knobs brown. Legs with coxae and trochanters yellow; femora yellowish brown, tips narrowly whitened; tibiae darker brown, base whitened, slightly narrower than the femoral apex, tips paling to yellowish white, narrowly so on fore and middle legs, extensively on posterior pair where nearly half the segment is included; tarsi whitened. Wings pale brown, stigma dark brown, solidy darkened; more whitened areas before and beyond stigma and more vaguely in centers of all outer medial cells and in *1st* M_2; no whitened droplets in outer ends of cells R_5 and M_1, as in some allied species; veins brown, *M* and *1st A* paler and more delicate. Venation: Basal section of R_{4-5} long, in punctiform contact with M_{1-2}.

Abdominal tergites brown, bases of segments narrowly yellowed, the color becoming more restricted on the outer segments, sternites more uniformly yellow; eighth segment brownish black to form a narrow ring; ninth segment light brown, yellowed outwardly, including the dististyles and outer half of basistyle. Male hypopygium (Fig. 6) with apex of inner dististyle relatively narrow, decurved, tip obtuse. Aedeagus unusually slender.

Habitat: Ecuador, Peru.

Holotype, ♂, Jatun Yacu, Napo-Pastaza, Ecuador, altitude 700 meters, March 1937 (Wm. Clarke-Macintyre). Paratopotypes, 3 males. Paratype, ♂, Cerro Azul, Loreto, Peru, April 27, 1947 (José Schunke).

I have shown the male hypopygium of *Brachypremna candida* Alexander for comparison with the present fly (Fig. 7).

Ctenophora Meigen

Ctenophora Meigen; Illiger's Mag., 2: 263; 1803; (type *pectinicornis* Linnaeurs: designated by Westwood, 1840; pseudotype *flaveolata* Fabricius, by Rondani, 1856.
Flabellifera Meigen; Nouv. Class. Mouch., p. 13; 1800; invalid name, suppressed by International Commission Zoological Nomenclature, Opinion 678; 1963.
Subgenus *Pselliophora* Osten Sacken; Berlin. Ent. Zeitschr., 30: 165-166; 1886; (subgenotype *laeta* Fabricius; designated by Enderlein, February 1912; Brunetti, November 1912).

The occurrence of three species of the subgenus *Pselliophora* in Tropical America provides a problem in distribution since the great majority of species are found in the Oriental and eastern Palaearctic regions. In the Nearctic region three other subgenera of *Ctenophora* occur, including typical *Ctenophora, Tanyptera* Latreille, and *Phoroctenia* Coquillett (*Malpighia* Enderlein). These various groups had been maintained as valid genera until 1954 when they were placed as subgenera (for discussion, see Alexander, Philippine Jour. Sci., 83: 264-265).

Antennae of male (Fig. 22) 12-segmented, with nine branched flagellar segments; pedicel very small, disciform; first flagellar segment stout, simple, roughly suboval; second to ninth segments each with four long branches, the basal pair longer than the outers; tenth flagellar segment with a single pair of branches that are basal in position, subequal in length to the axis of the segment; all branches and the axis of terminal one with very abundant erect black setae that slightly exceed the diameter of segment; apex of terminal segment narrowly yellowed and glabrous; longest branches with sparse scattered black verticils

near outer ends, outer branches without such verticils; branch of first segment with a series of similar verticils for virtually the entire length of lower surface, totalling about twelve.

The three Nearctic subgenera above listed have the flagellar branches much shorter, the longest being subequal to the segment, all branches virtually glabrous except for very sparse scattered verticils. In *Tanyptera* each such segment has three branches, the unpaired outer one short; *Ctenophora* and *Phoroctenia* each have four such branches on each segment, these being subequal in length in the latter subgenus, the outer pair slightly shorter in *Ctenophora.*

The Old World species of *Pselliophora* have the antennae 13-segmented, with the elongate terminal element unbranched, and with the basal flagellar segment more or less produced into a lobe or point. All species have the flagellar branches provided with conspicuous setae as in the Neotropical members of the subgenus.

The Neotropical species all are rare and little known. It is very probable that the immature stages occur in decaying wood as is the case in the Nearctic subgenera. In Asia, *Ctenophora (Pselliophora) chrysophila* Walker was observed while laying eggs in tree hollows, as recorded by Brunetti, 1912, while *C. (P.) dendrobia* (Edwards), in Penang, was reared from larvae found damaging the roots of *Dendrobium formosum* (Orchidaceae).

List of Species

margarita Alexander. — Mexico.
mesamericana Alexander. — Guatemala.
venezuelensis Alexander. — Venezuela.

Dolichopeza Curtis

Dolichopeza Curtis; British Ent., 2, plate 62; 1825; (type *albipes* Ström, as *sylvicola* Curtis; monotypic).
Leptina Meigen; Syst. Beschr., 6, plate 65, fig. 10; 1830; (type *albipes* Ström, as *sylvicola* Curtis; monotypic).
Apeilesis Macquart; Dipt. exot., suppl. 1: 8; 1846; type *cinerea* Macquart.

References: Alexander, C. P., Philippine Jour. Sci., 94: 564-582, figs. 40-61; 1965 (summary of subgenera).

Byers, G. W. The crane fly genus *Dolichopeza* in North America. Univ. Kansas Sci. Bull., 42: 665-924, 244 figs., 13 maps; 1961 (review of Nearctic species, including biology).

The genus *Dolichopeza* presently includes 11 subgenera, as considered in the Alexander reference above cited. There are scores of species, being found in all biotic regions, including Madagascar and New Zealand. The only one of these groups found in Tropical America is *Megistomastix* Alexander, discussed hereinafter. In the Nearctic region two other subgenera occur, *Dolichopeza* Curtis and *Oropeza* Needham, treated in detail by Byers, 1961.

The immature stages and their habitats of *Megistomastix* remain unknown but may be assumed to be generally similar to those of *Dolichopeza* and *Oropeza*. The early stages of the latter two occur in cushions or patches of bryophytes, including both mosses and liverworts, preferably in moist areas but in certain cases under much dryer conditions, as discussed by Byers.

Subg. **Megistomastix** Alexander

Megistomastix Alexander; Psyche, 19: 63-64, 3 figs.; 1912; (type *portoricensis* Alexander, monotypic and original designation).

All species of *Megistomastix* presently known are Neotropical and are restricted to the Greater Antilles, including Cuba, Hispaniola and Puerto Rico, but not occurring in Jamaica as presently known. It is probable that several further species remain to be discovered. It may be noted that all eight species known from Puerto Rico are found in the Luquillo National Forest and that six of these have been taken at light at a single time. The collections made in 1945 by Dr. Harry D. Pratt and Mr. Jenaro Maldonado-Capriles were from an altitude of about 2,600 feet in an environment of Sierra Palm, *Euterpe globosa* Gaertner. The extensive series of specimens, all taken at light, consisted only of males, a condition quite different from that found in most other crane flies that are attracted to light, where the great majority of specimens are females. The ecological conditions in the Luquillo Mountains have been discussed by H. A. Gleason and M. T. Cook (Scientific Survey of Porto Rico and the Virgin Islands, vol. 7, pt. 2: 126-129, plates 27-35; 1927, on the *Plant Ecology of Porto Rico*).

Characters that separate the subgenus from others include especially the very long male antennae (Figs. 11, 12), in some species with long conspicuous vestiture; the presence of abundant macrotrichia in the outer wing cells (Figs. 8-10), and in hypopygial structure, especially the lobed dististyles in the majority of the known species, being more generalized and unmodified

in *domingensis* and some others. In most species the male antennae are longer than the wing, being shortest in *darlingtoni* and *domingensis*. The vestiture of the antennal flagellum is noteworthy and provides strong characters for the separation of species. This includes unilaterally arranged verticils, with about two or three on each segment, and a more abundant normal vestiture, consisting of erect white or pale very delicate setae. As utilized in the accompanying key, certain species have such normal setae very long and abundant, much exceeding the verticils, as in *portoricensis* and *multifila,* for example. Other species have these normal setae much shorter than the blackened verticils, as found in *prattiana* and others.

The wings (Figs. 8-10) commonly have vein R_{1-2} atrophied, being present and complete in *darlingtoni* and *domingensis,* which species likewise have the most abundant and generally distributed macrotrichia in the cells, including all cells with the exception of *Sc* and extending basad almost to the arculus. Most Puerto Rican species have the trichia restricted to the cells beyond the cord or virtually so, being more numerous in *polytricha* and some others. The hypopygial structure has been discussed in detail under the various species (Figs. 13-20).

List of Species

acutiloba Alexander. — Puerto Rico.
borinquenia sp. n. — Puerto Rico.
cubensis Alexander. — Cuba.
darlingtoni Alexander. — Cuba.
devexa Alexander. — Cuba.
domingensis Alexander. — Hispaniola: Dominican Republic.
jenaro sp. n. — Puerto Rico.
multifila sp. n. — Puerto Rico.
obtusiloba Alexander. — Puerto Rico.
polytricha sp. n. — Puerto Rico.
portoricensis (Alexander). — Puerto Rico.
prattiana sp. n. — Puerto Rico.
vittinervis Alexander. — Cuba.

Key to the Puerto Rican species

1. Antennae of male with normal setae very long and delicate (Fig. 11), subequal to (*polytricha*) or exceeding the sparse unilaterally arranged more darkened verticils, the longest setae more than one-third the length of segment 2
— Antennae of male with normal setae shorter (Fig. 12); less than one-half the verticils and much shorter than the segments 5
2. General coloration of thorax, yellow, including the pleura; male hypopygium (Fig. 14) with dististyles virtually unbranched; lateral tergal arms narrow, glabrous ..... *borinquenia* sp. n.

— General coloration of thorax dark brown, including the pleura; male hypopygium with both dististyles bearing lobes or projections 3
3. Trichia of wing cells very abundant, including outer end of cell *R;* male hypopygium with apices of lateral tergal arms narrow, glabrous (Fig. 18) ..... *polytricha* sp. n.
— Trichia of wing cells less extensive, lacking in outer end of cell *R;* male hypopygium with lateral tergal arms obtuse, with setae to the tips 4
4. Setae of flagellar segments (Fig. 11) very long, approximately one-half the segment or more; male hypopygium (Fig. 16) with central lobe of ninth tergite broad, its apex rounded or subtruncate; margin of outer lobe of outer dististyle untoothed ..... *multifila* sp. n.
— Setae of flagellar segments shorter, less than one-half the longest segments; male hypopygium (Fig. 19) with central lobe of ninth tergite relatively small, subtriangular in outline; inner margin of outer lobe of outer dististyle with two separated teeth or roughenings ..... *portoricensis* (Alexander)
5. Apices of lateral lobes of tergite of hypopygium acute or subacute, their margins glabrous 6
— Apices of lateral lobes of tergite obtuse, with setae throughout 7
6. Wings with cell M_1 relatively short, its petiole subequal to *m;* hypopygium (Fig. 13) with lateral tergal lobes terminating in a single slender spine, central produced area of tergal border small, with few setae ..... *acutiloba* Alexander
— Wings (Fig. 9) with cell M_1 deep, sessile or virtually so; hypopygium (Fig. 15) with lateral tergal lobes stouter, unequally bilobed, central produced area of tergal border extensive, with abundant setae ..... *jenaro* sp. n.
7. Wings with anterior cord scarcely darkened; male hypopygium (Fig. 17) with lateral tergal lobes long, outer end more dilated, with numerous darkened spinoid setae, central produced area of tergal border subtriangular; inner lobe of outer dististyle enlarged, with abundant long spinoid setae, beak of inner style very stout .... *obtusiloba* Alexander
— Wings (Fig. 10) with a narrow brown seam over the anterior cord; male hypopygium (Fig. 20) with lateral tergal lobes relatively short, not expanded outwardly; central produced area of tergal border low and obtuse; inner lobe of outer dististyle small, beak of inner style slender ..... *prattiana* sp. n.

Dolichopeza (Megistomastix) acutiloba Alexander

Dolichopeza (Megistomastix) acutiloba Alexander; Jour. Agr. Univ. Puerto Rico, 21: 179-180, fig. 6 (♂ hypopygium); 1937.

Types from the Luquillo Mountains, Puerto Rico, June 7-11, 1935, taken by Julío García-Díaz. Male hypopygium (Fig. 13).

Dolichopeza (Megistomastix) borinquenia sp. n.

Size relatively small (wing about 7.5 mm.); general coloration of thorax yellowed, the darkened pattern restricted, pleura without markings; male antennae with normal flagellar vestiture long and delicate, exceeding the verticils; wings brownish yellow, stigma and a seam over the anterior cord brown, petiole of cell M_1 and *m* subequal; male hypopygium unusually simple and unmodified, especially the dististyles, lateral tergal arms appearing as narrow glabrous blades.

Male. — Length, about 7.8-8 mm.; wing, 7.3-7.5 mm.; antenna, about 8-9 mm. Rostrum and palpi brown. Antennae of male elongate, exceeding the wing or body, brown throughout; flagellar segments very long; normal vestiture long and delicate, the longest about one-fourth the segment, verticils smaller. Head brown.

Prothorax yellow. Mesonotum yellowed, the brown pattern very restricted, including the scutal lobes and vague areas on praescutum; pleura yellow, virtually unpatterned. Halteres with stem yellow, knob slightly darker. Legs with coxae and trochanters yellow; remainder of legs brown, femoral bases restrictedly yellowed. Wings brownish yellow, prearcular and costal fields slightly brighter yellow; stigma and a conspicuous confluent cloud on anterior cord brown, posterior cord more narrowly darkened; veins brownish yellow, slightly darker in the patterned areas. Cells beyond cord with abundant trichia, including also the outer ends of cells *Cu* and *1st A;* trichia of stigma stronger and darker. Venation: Petiole of cell M_1 variable in length, in type subequal to or shorter than *m,* in one paratype with the cell virtually sessile.

Abdomen chiefly yellow, the incisures restrictedly infuscated, the basal darkenings broader; hypopygium brownish yellow. Male hypopygium (Fig. 14) of unusually generalized conformation for a member of this subgenus, as shown particularly by the dististyles. Ninth tergite, *t,* with lateral tergal arms or lobes appearing as slender glabrous blades, inner edge near base slightly more produced; central lobe low, the nearly truncate border with relatively few long black setae, the lateral ones longest. Outer dististyle, *d,* a flattened blade that is gently narrowed outwardly, apex very obtuse, on inner margin near base with a very small lobe that is provided with few stout black setae; inner style smaller, boomerang-shaped, outer end glabrous, obtuse, on face with a low lobe provided with a brush of long setae, nearer the base with a very low glabrous blade.

Habitat: Puerto Rico.

Holotype, ♂, El Yunque, Luquillo National Forest, altitude 2,600 feet, May 25, 1945 (H. D. Pratt). Paratopotypes, 3 ♂♂, May 30-31, 1945.

This species is the most generalized member of the subgenus so far discovered in Puerto Rico, especially in hypopygial structure, with both dististyles being virtually unmodified.

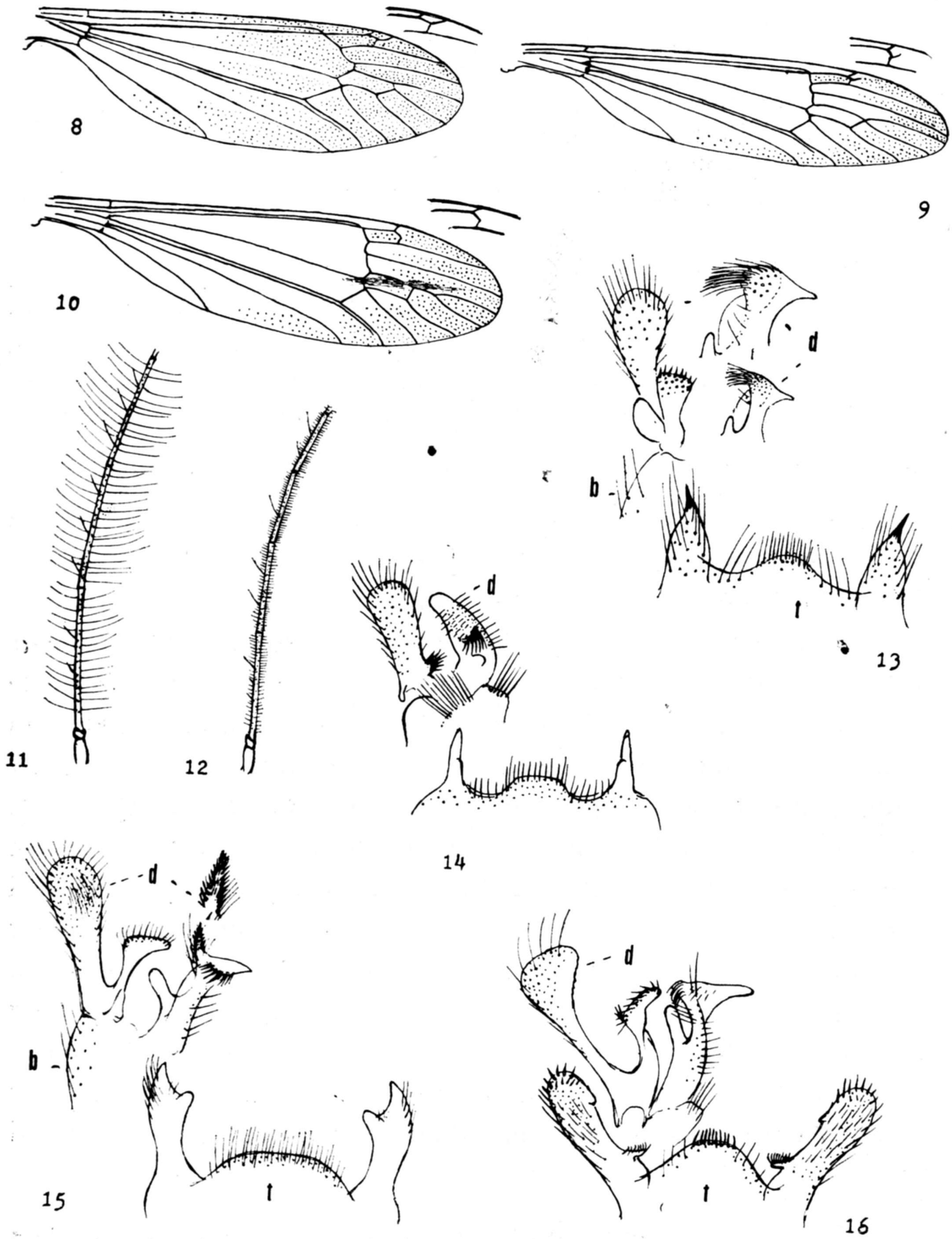

Fig. 8. *Dolichopeza (Megistomastix) domingensis* Alexander; venation. — Fig. 9. *Dolichopeza (Megistomastix) jenaro* sp. n.; venation. — Fig. 10. *Dolichopeza (Megistomastix) prattiana* sp. n.; venation. — Fig. 11. *Dolichopeza (Megistomastix) multifila* sp. n.; male antenna. — Fig. 12. *Dolichopeza (Megistomastix) prattiana* sp. n.; male antenna. — Fig. 13. *Dolichopeza (Megistomastix) acutiloba* Alexander; male hypopygium. — Fig. 14. *Dolichopeza (Megistomastix) borinquenia* sp. n.; male hypopygium. — Fig. 15. *Dolichopeza (Megistomastix) jenaro* sp. n.; male hypopygium. — Fig. 16. *Dolichopeza (Megistomastix) multifila* sp. n.; male hypopygium. — Symbols: *b,* basistyle; *d,* dististyle; *t,* tergite.

Dolichopeza (Megistomastix) jenaro sp. n.

Antennae of male with normal vestiture short, to about one-half the length of the verticils; wings faintly darkened, virtually unpatterned except for the brown stigma, cell M_1 long, sessile or virtually so; male hypopygium with lateral tergal arms unequally bilobed, both lobes with tips glabrous; central lobe very broad; beak of dististyle narrow; outer dististyle unequally bilobed, the outer arm an elongate club.

Male. — Length, about 8-9 mm.; wing, 8-9 mm.; antenna, about 9-10 mm. Frontal prolongation of head and palpi light brown, distal half of terminal segment of latter darker brown. Antennae with scape and pedicel dark brown, flagellum black; flagellar segments elongate, the normal vestiture relatively short, up to about one-half the blackened verticils. Head brownish gray.

Pronotal scutum brownish yellow, scutellum clearer yellow. Mesonotal praescutum brownish gray with three darker brown stripes, the central one narrow; scutal lobes similarly darkened, posterior sclerites light gray. Pleura obscure yellow, conspicuously patterned with dark brown on anepisternum, ventral sternopleurite and meron. Halteres with stem yellow, knob brown. Legs with coxae and trochanters yellowed; femora brownish yellow, brighter basally, tips darker; tibiae and tarsi darker brown. Wings (Fig. 9) faintly darkened, virtually unpatterned except for the brown stigma; veins brown. Macrotrichia in cells beyond general level of outer end of cell *1st* M_2, including also the stigma and outer ends of cells M_4 *to 1st A*. Venation: Cell M_1 long, sessile, in cases broadly so, in others more punctiform; cell *1st* M_2 long and narrow, M_{3-4} short, usually less than one-half the basal section of M_{1-2}, in cases to about two-thirds this length, in other cases virtually lacking, in still others with *m-cu* on M_4 beyond the base.

Abdominal tergites chiefly dark brown, posterior borders of outer segments narrowly yellowed; sternites inconspicuously bicolored, the yellow apices broad; hypopygium brownish yellow. Male hypopygium (Fig. 15) with lateral tergal arms, *t*, broad, the outer end unequally bilobed, both blades glabrous, the apical one narrower, subacute; central tergal region very broad, with abundant long setae. Outer dististyle, *d*, unequally bilobed, outer arm an elongate club with long coarse setae, on inner face with a dense concentration of setae of various lengths, inner lobe smaller, dilated at apex, both lobes with abundant long setae;

inner style with beak narrow, dorsal crest erect, with blackened setae, posterior crest a flattened glabrous blade.

Habitat: Puerto Rico.

Holotype, ♂, El Yunque, Luquillo National Forest, altitude about 2,000 feet, November 27-28, 1943 (H. D. Pratt and Jenaro Maldonado-Capriles). Paratopotypes, numerous ♂♂, 2,600 feet, May 25-30, 1945 (H. D. Pratt).

I am pleased to name this species for the collector of the type, Jenaro Maldonado Capriles, of Cayey Regional College, Puerto Rico, to whom I am indebted for several interesting Tipulidae from Puerto Rico and northern South America. As is indicated by the key to the regional species the most similar form is *Dolichopeza* (*Megistomastix*) *acutiloba* Alexander, separated by the characters listed.

Dolichopeza (Megistomastix) multifila sp. n.

Antennae of male elongate, about one-fourth longer than the wing; normal vestiture of flagellar segments very long and abundant, about one-half the longest segment and much exceeding the verticils; mesonotum brownish yellow, patterned with darker brown; wings weakly tinged with brown, stigma darker, petiole of cell M_1 subequal to *m;* male hypopygium with lateral tergal arms simple, tips obtuse; outer arm of outer dististyle broadly expanded, margin smooth.

M a l e. — Length, about 7-7.5 mm.; wing, 7-8 mm.; antenna, about 9-9.5 mm. Rostrum and palpi dark brown. Antennae of male very long, about one-half longer than the wing; scape, pedicel and proximal end of first flagellar segment light brown, the remainder darker; flagellar segments long cylindrical, the normal vestiture very long and abundant, about one-half the longest segments, much exceeding the only slightly differentiated unilaterally distributed verticils. Head brown.

Pronotum yellow, darker medially. Mesonotal praescutum brownish yellow, vaguely patterned with darker brown, including the central line and lateral borders, posterior sclerites light brown. Pleura brownish yellow, dorsopleural membrane light yellow. Halteres brown, base of stem narrowly dull orange. Legs with coxae and trochanters yellowed; remainder brown, femoral bases yellowed. Wings weakly tinged with brown, stigma darker; veins dark brown. Venation: Cell M_1 with petiole subequal to or a little shorter than *m*.

Abdominal segments brownish yellow, patterned basally with dark brown, more broadly so on tergites; hypopygium brownish yellow. Male hypopygium (Fig. 16) with lateral tergal arms, *t,* stout, tips obtuse, apical setae relatively short; central tergal

region low-convex, obtuse, with relatively few setae. Outer dististyle, *d,* unequally bilobed, outer arm very long, apex broadly expanded, margins smooth, inner lobe slender, bent on outer half, margin with short black setae; inner style with beak very slender, dorsal crest relatively stout, posterior crest a flattened glabrous blade.

Habitat: Puerto Rico.

Holotype, ♂, El Yunque, Luquillo National Forest, altitude 2,600 feet, May 31, 1945 (H. D. Pratt). Paratopotypes, 3 ♂♂, May 25-30, 1945 (H. D. Pratt).

In the nature of vestiture of the male antennae, the present fly is most as in *Dolichopeza* (*Megistomastix*) *portoricensis* (Alexander), differing in the characters provided in the key.

Dolichopeza (Megistomastix) obtusiloba Alexander

Dolichopeza (Megistomastix) obtusiloba Alexander; Jour. Agr. Univ. Puerto Rico, 21: 180-181, fig. 7 (♂ hypopygium); 1937.

Types from the El Yunque trail, Luquillo National Forest, Puerto Rico, at Km. 1.3, July 27, 1935, collected by Julío García-Díaz. Male hypopygium (Fig. 17).

Dolichopeza (Megistomastix) polytricha sp. n.

Size large (wing of male to 8.5 mm.); male antennae slightly exceeding the body or wings, normal vestiture of flagellar segments darkened, elongate, exceeding the verticils; macrotrichia of wing cells unusually abundant, including all cells beyond cord, as well as the outer ends of cells *R, M, Cu,* and *1st A;* male hypopygium with apices of lateral tergal arms narrowed and glabrous.

Male. — Length, about 8-8.5 mm.; wing, 8-8.5 mm.; antenna, about 9-10 mm. Frontal prolongation of head obscure yellow; palpi beyond the basal segment dark brown. Antennae of male slightly exceeding the wing, black; flagellar segments very long-cylindrical, normal vestiture dark brown, exceeding the verticils, the longest about one-third the segment. Head brown, restrictedly orange immediately behind the antennal bases.

Pronotum obscure yellow, patterned with brown. Mesonotal praescutum brownish yellow, with brown stripes that include an abbreviated central area and a U-shaped lateral mark that involves the darker outer margin; scutal lobes reddish brown to darker brown; posterior sclerites of notum brownish yellow to light brown. Pleura dark brown with an obscure yellow ventral

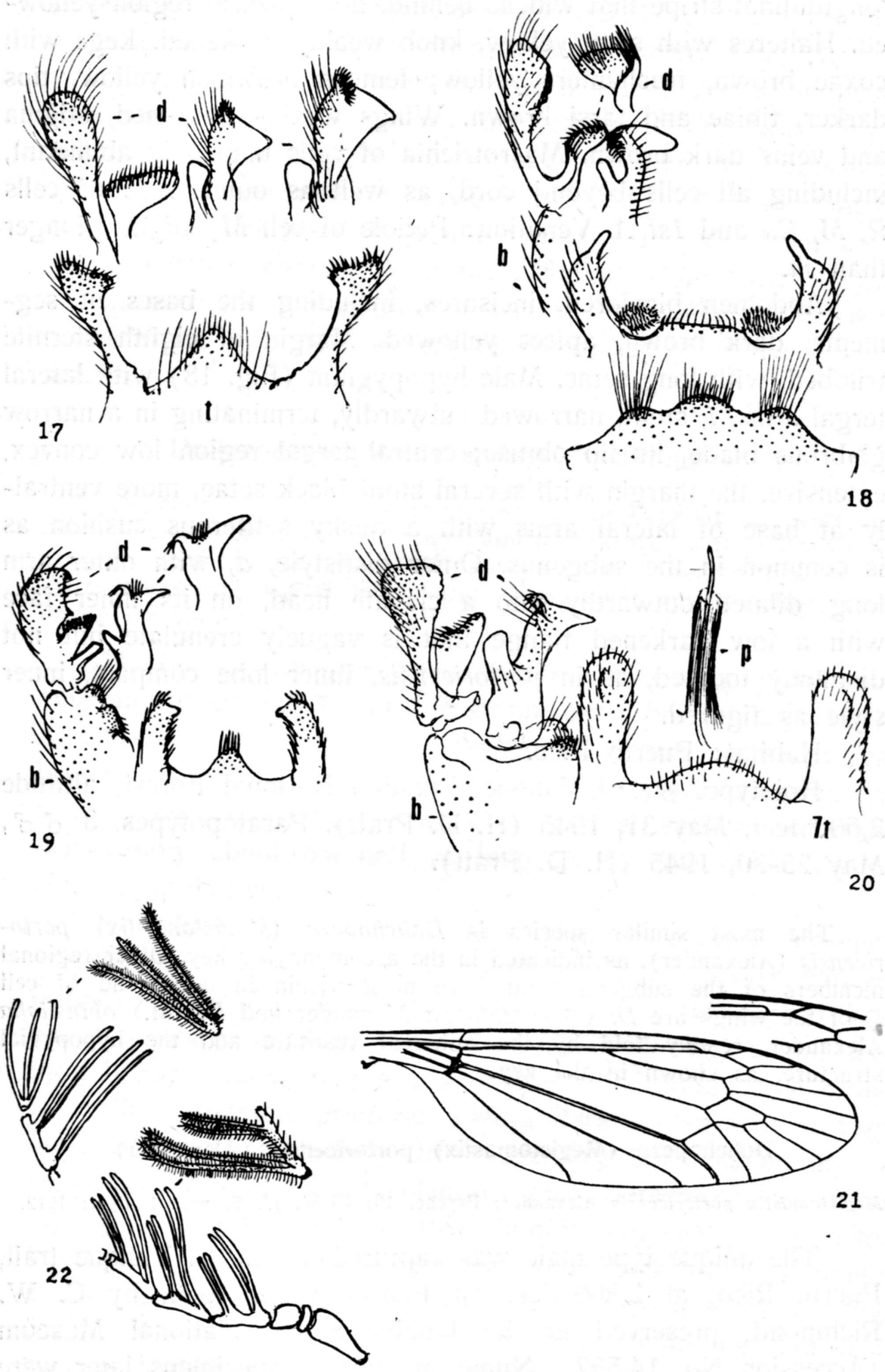

Fig. 17. *Dolichopeza (Megistomastix) obtusiloba* Alexander; male hypopygium. — Fig. 18. *Dolichopeza (Megistomastix) polytricha* sp. n.; male hypopygimu. — Fig. 19. *Dolichopeza (Megistomastix) portoricensis* (Alexander); male hypopygium. — Fig. 20. *Dolichopeza (Megistomastix) prattiana* sp. n.; male hypopygium. — Fig. 21. *Ctenophora (Pselliophora) margarita* Alexander; venation. — Fig. 22. *Ctenophora (Pselliophora) margarita* Alexander; male antenna. — Symbols: *b*, basistyle; *d*, dististyle; *p*, phallosome; *t*, tergite.

longitudinal stripe that widens behind, dorsopleural region yellowed. Halteres with stem yellow, knob weakly darkened. Legs with coxae brown, trochanters yellow; femora brownish yellow, tips darker, tibiae and tarsi brown. Wings weakly darkened, stigma and veins dark brown. Macrotrichia of cells unusually abundant, including all cells beyond cord, as well as outer ends of cells *R, M, Cu* and *1st A*. Venation: Petiole of cell M_1 slightly longer than *m*.

Abdomen bicolored, incisures, including the bases of segments, dark brown, apices yellowed. Margin of eighth sternite trilobed, with long setae. Male hypopygium (Fig. 18) with lateral tergal arms, *t,* stout, narrowed outwardly, terminating in a narrow glabrous blade, its tip obtuse; central tergal region low convex, extensive, the margin with several stout black setae, more ventrally at base of lateral arms with a dusky setiferous cushion as is common in the subgenus. Outer dististyle, *d,* with outer arm long, dilated outwardly into a clavate head, on its inner face with a low darkened flange that is vaguely crenulate but not distinctly toothed, as in *portoricensis,* inner lobe compact, inner style as figured.

Habitat: Puerto Rico.

Holotype, ♂, El Yunque, Luquillo National Forest, altitude 2,600 feet, May 31, 1945 (H. D. Pratt). Paratopotypes, 3 ♂♂, May 25-30, 1945 (H. D. Pratt).

The most similar species is *Dolichopeza* (*Megistomastix*) *portoricensis* (Alexander), as indicated in the accompanying key. Other regional members of the subgenus that have macrotrichia in outer end of cell *R* of the wings are *D.* (*M.*) *acutiloba* Alexander and *D.* (*M.*) *obtusiloba* Alexander, readily told by the antennal vestiture and the hypopygial structure, as shown in the key.

Dolichopeza (Megistomastix) portoricensis (Alexander)

Megistomastix portoricensis Alexander; Psyche, 19: 63-66, pl. 5, with 3 figs.; 1912.

The unique type male was captured on the El Yunque trail, Puerto Rico, at 2,800 feet on February 20, 1900, by C. W. Richmond, preserved in the United States National Museum (Accession No. 14,592). Numerous further specimens later were taken on El Yunque, chiefly at about 2,600 feet, in 1943 and 1945 by Dr. Harry D. Pratt and Mr. Jenaro Maldonado Capriles.

In the figures above cited, the conspicuous vestiture of the male antennae and arrangement of the macrotrichia in the wing cells were shown satisfactorily. The drawing of the male hypo-

pygium was made from the dried type and is highly diagrammatic. A more satisfactory figure is provided herewith (Fig. 19).

In the series of specimens now available certain individuals have the true verticils greatly reduced or lacking and with the normal vestiture slightly longer than in other specimens where the verticils are present, though reduced. I believe that this condition of the verticils is the normal one, as shown by the type. In other regards, as in the venation, wing trichiation, and structure of the hypopygium, I can see no essential differences between the two sets of specimens presently referred to this species.

Dolichopeza (Megistomastix) prattiana sp. n.

Antennae of male with normal vestiture of flagellar segments short, about one-half the verticils; wings faintly darkened, with a brown seam over the cord; petiole of cell M_1 subequal to or longer than *m;* male hypopygium with lateral tergal arms stout, their apices obtuse, median region low-convex.

Male. — Length, about 8-8.5 mm.; wing, 6.5-7 mm.; antenna, about 6.5-7 mm. Rostrum dark brown, palpi black. Antennae of male (Fig. 12) elongate, subequal to wing; scape brownish black, remainder of organ dark brown; flagellar segments long-cylindrical, the whitened normal vestiture short and dense, only about one-half as long as the blackened verticils. Head light brown.

Pronotum light yellow, sides slightly darker. Mesonotal praescutum with four light brown stripes that are very narrowly bordered exteriorly by slightly darker brown, the central interspace similarly colored, humeral region yellowed; scutal lobes light brown, central region and remainder of notum pale brownish yellow, sparsely pruinose. Pleura dark brown with a vague more yellowed longitudinal stripe extending from behind the fore coxae backward to the metapleural region; dorsopleural membrane light yellow. Halteres with stem faintly darkened, base yellow, knob more darkened. Legs with fore coxae dark brown, remaining coxae more yellowed; trochanters yellow; remainder of legs light brown. Wings (Fig. 10) faintly darkened, prearcular and costal regions slightly more yellowed; stigma and a confluent seam over anterior cord darker brown, narrowed behind; veins brown. Macrotrichia in cells beyond cord, including also the outer ends of cells *Cu* and *1st A*. Venation: *Rs* in transverse alignment with remainder of cord, subequal to basal section of R_{4-5}; petiole of cell M_1 subequal to *m*.

Abdominal tergites bicolored, bases narrowly brown, outer parts paler; hypopygium brown. Male hypopygium (Fig. 20) with lateral tergal arms, *t,* stout, with a vague low flange near outer end, apex obtuse; central tergal region low convex. Outer dististyle, *d,* unequally bilobed, outer arm longer, clavate, with long delicate setae, apex broadly obtuse; outer end of inner lobe dilated, the setae shorter and stouter; inner style with beak pale, triangular in outline, dorsal crest darkened, narrow, with a concentration of black setae, posterior crest a flattened glabrous dark colored blade.

Habitat: Puerto Rico.

Holotype, ♂, El Yunque, Luquillo National Forest, altitude 2,000 feet, November 27, 1943 (H. D. Pratt and J. Maldonado Capriles). Paratopotypes, numerous ♂♂, 2,600 feet, May 30 - June 6, 1945 (H. D. Pratt).

I have named this interesting fly for my former student and outstanding entomologist, Dr. Harry D. Pratt, who collected many species of Tipulidae in Puerto Rico. As is shown by the key the most similar species is *Dolichopeza* (*Megistomastix*) *obtusiloba* Alexander, readily told by the hypopygial structure, as described.

Elnoretta Alexander

Elnoretta Alexander; Diptera Patagonia and South Chile, 1: 15-16, fig. 31 (wing), fig. 111 (antenna); (type *acracanthoides* Alexander; monotypic).

There is a single known species, apparently allied to the Australian genus *Acracantha* Skuse. The antennae of the male (Fig. 25) are 12-segmented; flagellar segments 1 to 9 each with a single long terminal branch, all being longer than the segment with the exception of the last which is slightly shorter; flagellar segments with scattered strong setae on outer face, branches strongly wrinkled, without setae but with numerous nearly circular areas that lack setae. In the female (Fig. 26) antennae 13-segmented or 14-segmented, the lower face of proximal three flagellar segments slightly produced to appear serrate; fourth segment stouter than the succeeding ones, the latter cylindrical, provided with very long setae, the longest much exceeding the segments. Wings (Fig. 23) with cell M_1 sessile. Other structural features of the genus are discussed in the original definition.

List of Species

acracanthoides Alexander. — Chile.

Holorusia Loew

Holorusia Loew; Berl. Ent. Zs. 7: 276, 1863; type, *grandis* Bergroth = *rubiginosa* Loew, preoccupied name; Nearctic; monotypic.
Ctenacroscelis Enderlein; Zool. Jahrb., Syst., 32: 1-2; 1912; (type *dohrnianus* Enderlein; original designation).

The recent paper by Vane-Wright is of great importance in an understanding of this genus and its synonymy. * *Holorusia* was based on a single species from western North America but now is united with the extensive genus *Ctenacroscelis* Enderlein, with approximately 90 f.orms described from the Old World, with a marked concentration of species in eastern Asia. During the past half century a large number of chiefly South American species have been assigned to *Holorusia* by the present writer but it has been shown by Vane-Wright that these more properly should be placed in two other generic groups, *Ischnotoma* Skuse and *Zelandotipula* Alexander, under which names they may be consulted in the present paper. As it now stands, *Holorusia* in the. New World includes only the genotype, *grandis* Bergroth, (*rubiginosa* Loew), described from California, with a wide range in western North America. Vane-Wright suggests that this isolated species may have reached its present range via the former Bering land connection and this belief is furthered by the recent discovery of the species in central Alaska, where two females have been taken in McKinley National Park (by F. Morand; in the United States National Museum, reported to the writer by Dr. Alan Stone).

Ischnotoma Skuse

Ischnotoma Skuse; Proc. Linn. Soc. New South Wales, (2) 5: 114-115; 1890; (type *Tipula eburnea* Walker, as *Tipula serricornis* Macquart, designated by Alexander, 1920: 53).

In a recent paper, discussed under the preceding genus, Vane-Wright has made a critical survey of *Ischnotoma* Skuse and some related groups. In Tropical America he recognized two generic entities formerly included in our conception of the genus *Holorusia,* these being *Ischnotoma* and *Zelandotipula* Alexander. In the former he recognized two subgenera in this faunal area, these being *Ischnotoma* s. s. and *Icriomastax* Ender-

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*) Vane-Wright, R. I., A re-assessment of the genera *Holorusia* Loew (= *Ctenacroscelis* Enderlein), *Ischnotoma* Skuse and *Zelandotipula* Alexander (Diptera: Tipulidae), with notes on their phylogeny and zoogeography. — Jour. nat. Hist., 1: 511-547, 46 figs.; 1967.

lein, to which should be added the more recently proposed *Neotipula* Alexander. Vane-Wright placed virtually all American species in *Icriomastax* but it now appears that these species would be placed more satisfactorily in typical *Ischnotoma* and it seems questionable to me as to whether *Icriomastax,* and probably also *Neotipula,* can be maintained as distinct from *Ischnotoma.* I have re-examined the male hypopygia of virtually all species known in the genus and these show a noteworthy range in structure in both the Australian and Neotropical species. In the present report I am assigning the majority of the regional species to the subgenus *Ischnotoma,* restricting *Icriomastax* to the so-called *jujuyensis* group, including ten species, all from Argentina and Brazil. *Neotipula* has four species, all being more northern than the representatives of the other subgenera. Two aberrant species, *problematica* Alexander and *penai* Alexander, for the present are placed in typical *Ischnotoma.*

The generic characters have been discussed in detail by Vane-Wright. The normal type of antenna is illustrated (Fig. 27, *decorata*) but certain other species have a greater enlargement of the flagellar segments to produce a weak pectination. Wings with veins unusually glabrous, the trichia more numerous on veins *C, Sc* and R_1, more rarely on the posterior outer radial veins. Squama naked or weakly setose. Male hypopygium with the ninth tergite emarginate in *Ischnotoma,* entire and produced medially in *Icriomastax.* It should be noted that in the latter subgenus, including the type, *ocellata* Enderlein, that spinoid setae are present on the inner dististyle, somewhat as found in *Leptotarsus* and *Zelandotipula* and apparently indicating a relationship to these groups. In *Icriomastax* these spinoid elements are relatively few in number, being reduced to a single spine in *calliope* while being lacking in *nitra.*

Of interest is a fossil species, *Ischnotoma vasifera* (Cockerell and Haines, 1921), described from the Bembridge beds of the Isle of Wight in the English Channel, assigned to the Oligocene and originally placed in *Holorusia.* Vane-Wright has re-studied the type specimen of this and emphasizes the close general resemblance of this fossil to the recent *Ischnotoma* (*Ischnotoma*) *par* (Walker) of eastern Australia.

Vane-Wright suggests that *jujuyensis* may prove to be identical with the still insufficiently known *nudicornis* (Macquart). The latter was described from the vicinity of Buenos Aires whereas *jujuyensis* is from the western more mountainous pro-

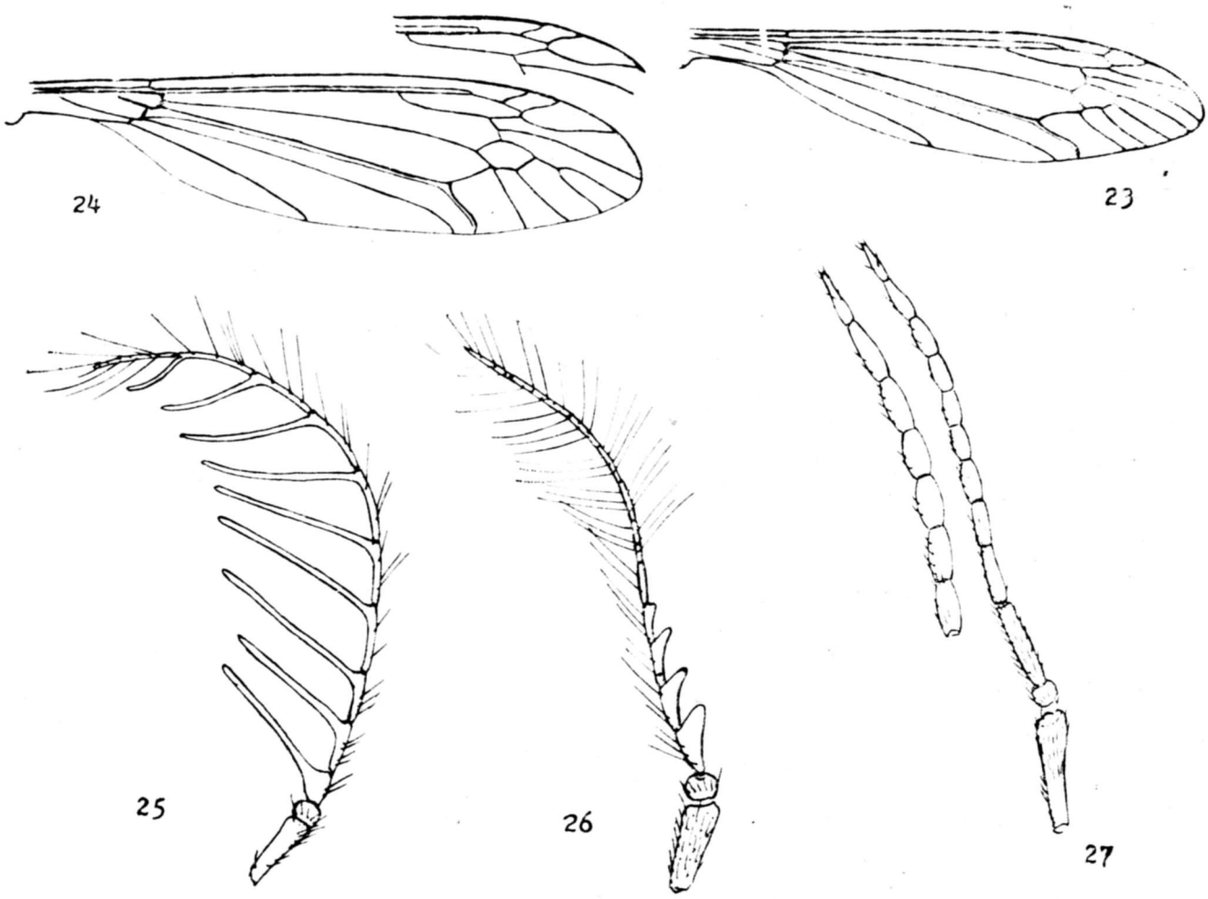

Fig. 23. *Elnoretta acracanthoides* Alexander; venation. — Fig. 24. *Ischnotoma (Ischnotoma) decorata* (Philippi); venation. — Fig. 25. *Elnoretta acracanthoides* Alexander; male antenna. — Fig. 26. *Elnoretta acracanthoides* Alexander; female antenna. — Fig. 27. *Ischnotoma (Ischnotoma) decorata* (Philippi); male antenna.

vinces of Argentina. There are certain Brazilian species that geographically are as close to Buenos Aires as is *jujuyensis,* and *nudicornis* may be found to pertain to one of these or perhaps may represent a further member of the *ocellata* group.

The immature stages of *jujuyensis* occur in wet mats of plants growing along stream margins. These have been well described and figured by Carlos Bruch (Contribucion al conocimiento de los Tipulidos Argentinos (Diptera). Physis, 17: 1-28, 11 plates-references pp. 12-16, pl. 1, fig. 2 (habitat of immature stages), pl. 3, fig. 7, pl. 7, figs. 26-28 (larva and pupa), pl. 8, figs. 1-16 (details of egg, larva and pupa).

List of Species

Subgenus *Ischnotoma* Skuse

concinna (Philippi), as *Tipula* — Chile.
decorata decorata (Philippi), as *Tipula* — Chile.
d. araucana (Alexander) — Chile.
delpontei (Alexander), as *Holorusia* — Argentina, Chile.
fagetorum fagetorum (Alexander), as *Holorusia* — Argentina.
f. trunculata (Alexander), as *Holorusia* — Argentina.
frauenfeldi (Schiner), as *Tipula* — Chile.
(may be *decorata* (Philippi).
fuscostigmosa (Alexander), as *Holorusia* — Chile.
homochroa (Alexander), as *Holorusia* — Chile.
larotypa (Alexander), as *Holorusia* — Chile.
peñai (Alexander), as *Holorusia* (*Ischnotoma*) — Chile.
Syn. — *guzmani* (Alexander), as *Holorusia* (*Ischnotoma*) — lapsus for *peñai*.
porteri (Alexander), as *Holorusia* — Chile.
postnotalis (Alexander), as *Holorusia* — Argentina.
problematica (Alexander), as *Holorusia* — Chile.
rufostigmosa (Macquart), as *Tipula* — Chile.
schineriana (Alexander), as *Holorusia* — Chile.
shannoniana (Alexander), as *Holorusia* — Chile.
silvai (Alexander), as *Holorusia* — Chile.
vittigera (Philippi), as *Tipula* — Chile.

Subgenus *Icriomastax* Enderlein

Icriomastax Enderlein; Zool. Jahrb., Syst., 32: 9; 1912; (type *ocellata* Enderlein, monotypic and original designation).

antinympha (Alexander), as *Holorusia* — Brazil.
calliope (Alexander), as *Holorusia* — Brazil.
euterpe (Alexander), as *Holorusia* — Brazil.
helios (Alexander), as *Holorusia* — Brazil.
jujuyensis (Alexander), as *Holorusia* — Argentina.
(may be *nudicornis* (Macquart), auct. Vane-Wright)
nitra (Alexander), as *Holorusia* — Brazil.
nudicornis (Macquart), as *Tipula* — Argentina.
ocellata (Enderlein), as *Icriomastax* — Brazil.
phaeton (Alexander), as *Holorusia* — Brazil.
zikani (Alexander), as *Holorusia* — Brazil.

Subgenus *Neotipula* Alexander

Tipula (Neotipula) Alexander; Jour. N. Y. Ent. Soc., 48: 105-106; 1940; (type *pectinella* Alexander, original designation).

maya (Alexander), as *Tipula* — Guatemala.
paprzyckii (Alexander), as *Tipula* (*Neotipula*) — Peru.
pectinella (Alexander), as *Tipula* (*Neotipula*) — Panama.
peñata (Alexander), as *Holorusia* (*Holorusia*) — Ecuador, Peru.

Leptotarsus Guérin-Méneville

Leptotarsus Guérin-Méneville; Voy. corvette La Coquille, Zool., 2, pt. 2: 286, pl. 20, fig. 1; 1830; (type *Leptotarsus* Macquarti Guérin-Méneville; Australian; monotypic).

As presently recognized in the Neotropical region, the genus *Leptotarsus* includes eleven subgeneric groups. As had been indicated by the writer in various recent papers (as in South African Animal Life, 10: 244-245; 1964) certain groups of Tipuline crane flies that had been maintained as valid genera now appear to be of subgeneric rank while some others in various parts of the Southern Hemisphere possibly will fall in the syynonymy.

It had been believed that the oldest genus in the complex was *Longurio* Loew, 1869, but a consideration of the problem being made in Australia by Dr. N. Dobrotworsky, and by the writer, indicates that the essentially Australian genus *Leptotarsus* belongs here and apparently is the valid name for the genus. In the Tipulinae there are five still older names but these evidently do not apply to the present group. These names are *Tipula* Linnaeus, 1758; *Nephrotoma* Meigen, 1803; *Ctenophora* Meigen, 1803; *Megistocera* Wiedemann, 1828 (*Maekistocera* Wiedemann, 1821), and *Dolichopeza* Curtis, 1825.

The chief characters used in referring these groups to a single genus are found in the male hypopygium, especially the dististyles and phallosome. Virtually all species in this complex have modified setae on the inner dististyle that have been designated as *spinoid setae* from their resemblance to true spines. There seems to be no question but that this character indicates affinities among the various groups despite their differences in general appearance. It may be indicated that comparable spinoid setae on the dististyle occur in other groups of the primitive Tipulinae which on other characters are considered as being distinct from *Leptotarsus,* such including *Clytocosmus* Skuse, *Platyphasia* Skuse, *Zelandotipula* Alexander, and others. Additional to the dististyles the very generalized phallosome, with unusually simple gonapophyses and aedeagus, also appears to indicate close interrelationships but is found in various other genera in the Tipulinae.

It should be noted that two further groups that are maintained as subgenera, *Macromastix* Osten Sacken, 1886, and *Habromastix* Skuse, 1890, are Australasian in distribution. The

various records for these groups from Tropical America pertain to other subgenera, chiefly to *Longurio.*

To the writer there appears to be an analogy between *Leptotarsus,* as here discussed, and *Limonia* Meigen, the typical genus of the subfamily Limoniinae. In most subgenera of *Limonia* there similarly are found spinoid setae on the dististyle that provide important characters in defining the various groups. Also in *Limonia,* as in the present genus, there is a considerable range in body size and structure, in venation, and in the relative length and slenderness of the legs. In some *Limonia* s. s. and in *Metalimnobia* Matsumura the body is large and bulky, a condition somewhat comparable to that found in *Leptotarsus* and *Semnotes* in the Tipulinae, while still other groups, as *Thrypticomyia* Skuse or *Euglochina* Alexander, have a delicate ethereal structure, with slender bodies and unusually long legs, analagous to the condition found in *Tanypremna* and some allied subgenera in the present genus.

In most subgenera of *Leptotarsus* the antennae of both sexes are very small but species occur where the males have the organ excessively elongated, as in *Araucomyia* (as *paulseni*), *Macromastix* (as *costalis* Swederus), *Habromastix,* and in certain species that presently are assigned to *Longurio.*

The immature stages of a number of species have been described, especially in the subgenus *Longurio* in South Africa [H. G. Wood, The crane-flies of the South-West Cape (Diptera, Tipuloidea). Ann. South African Mus., 39: 1-327, 105 figs.; 1952]. Most of these species occur in soil among clumps of plants of the monocotyledonous family Restionaceae, often under relatively dry conditions. In America, the type of the subgenus *Longurio* (*testaceus* Loew) has been found in wet sandy soil at the margins of springs, while the related *L. rivertonensis* (Johnson) is more nearly aquatic, the larvae occurring in cold springs [references in Alexander, The crane-flies of New York. Part 2: 990-993, figs. 488-491 (*testaceus*), fig. 492 (*rivertonensis*); 1920]. In New Zealand, various species that are referred to the subgenera *Longurio* and *Macromastix,* have been found living in soil beneath leaf mold, as described by J. S. Rogers (Trans. New Zealand Inst., 58: 301-309, 14 figs.; 1927). The immatures of species in the subgenus *Chlorotipula* Alexander have been found living in decaying wood in New Zealand, including *L.* (*C.*) *albistigma* (Edwards) and *L.* (*C.*) *holochlora* (Nowicki), the latter having been described and figured by G.

V. Hudson (Manual New Zealand Insects, pp. 47-48, pl. 5, figs. [larva, pupa] 1892), in cases being found in the decaying wood of old buildings and of some economic importance.

List of Species

Subgenus *Aldrovandia* Enderlein

Aldrovandia Enderlein; Zool. Jahrb., Syst., 32: 52, fig. (venation); 1912: (type *gesneri* Enderlein; monotypic and original designation).

gesneri (Enderlein), as *Aldrovandia* — Brazil.

Subgenus *Araucomyia* Alexander

Araucomyia Alexander; Diptera Patagonia and South Chile, 1: 14-15; 1929; as *Macromastix-Araucomyia;* (type *paulseni* (Philippi); original designation).

brevihirsutus (Alexander), as *Macromastix-Araucomyia* — Chile.
paulseni (Philippi), as *Tipula* — Chile.
penitus (Alexander), as *Macromastix-Araucomyia* — Chile.

Subgenus *Ceoneura* Alexander

Ceoneura Alexander; Ent. News, 35: 289; 1924; as *Tanypremna-Ceoneura;* (type *idioneura* (Alexander); monotypic and original designation).

idioneurus (Alexander), as *Tanypremna-Ceoneura* (Fig. 28, venation) — British Guiana.

Subgenus *Leptotarsus Guérin-Méneville*

Reference as under the genus; type *Leptotarsus Macquarti.*

annulipes (Philippi), as *Tipula* — Chile. May not be placed correctly in this subgenus.

Subgenus *Limoniodes* Alexander

Limoniodes Alexander; Ann. Mag. Nat. Hist., (11) 1: 337; 1938; as *Tanypremna-Limoniodes;* type *sulphurella* (Alexander); monotypic and original designation).

sulphurella (Alexander), as *Tanypremna-Limoniodes* (Fig. 29, venation) — Ecuador.

Subgenus *Longurio* Loew

Longurio Loew; Diptera Americae septentrionalis indigena, Centuria octava. Berlin. Ent. Zeitschr., 13: 3; 1869; (type *testaceus* Loew; Nearctic, original description and monotypic).

atrirostris (Alexander), as *Macromastix* — Chile.
borgmeieranus sp. n. — (Fig. 38, ♂ hypopygium) — Brazil.
brasiliae (Alexander), as *Macromastix* (*Macromastix*) — Brazil.
browni (Alexander), as *Macromastix* — Ecuador.
bullocki (Alexander), as *Macromastix* (*Araucomyia*) — Argentina, Chile.
caparaona (Alexander), as *Macromastix* (*Macromastix*) — Brazil.
carreranus (Alexander), as *Macromastix* — Brazil.

chrysostigma (Alexander), as *Macromastix* (*Macromastix*) — Brazil.
decoloratus (Alexander), as *Habromastix* — Paraguay.
espinozai (Alexander), as *Macromastix* — Chile.
eucrypta (Alexander), as *Longurio* — Chile.
exemptus (Alexander), as *Habromastix* (Fig. 39, ♂ hypopygium) — Brazil.
goyazana (Alexander), as *Macromastix* (*Macromastix*) — Brazil.
guimaraesi (Alexander), as *Macromastix* — Brazil.
gymnocera (Alexander), as *Macromastix* — Brazil.
helota sp. n. (Fig. 40, ♂ hypopygium) — Brazil.
huanucensis (Alexander), as *Longurio* (Fig. 36, venation) — Peru.
insidiosus (Alexander), as *Macromastix* (*Macromastix*) — Brazil.
ixion (Alexander), as *Macromastix* (*Macromastix*) — Brazil.
lemniscatus (Alexander), as *Habromastix* — Brazil.
lustralis (Alexander), as *Tipula* — Brazil.
luteistigma (Alexander), as *Macromastix* (*Araucomyia*) — Brazil.
nahuelbutae (Alexander), as *Macromastix* — Chile.
nigroabdominalis (Alexander), as *Habromastix* — Brazil.
nocivus (Alexander), as *Longurio* — Chile.
paraguayanus (Riedel), as *Tipulodina* — Paraguay.
paraguayensis (Alexander), as *Tipula* — Paraguay.
perglabratus (Alexander), as *Longurio* (*Longurio*) — Brazil.
phaedra (Alexander), as *Macromastix* — Brazil.
pygmaeus (Alexander), as *Macromastix* — Peru.
rabelloi (Alexander), as *Longurio* (*Longurio*) — Brazil.
serotinella (Alexander), as *Macromastix* — Chile.
sessoris (Alexander), as *Longurio* (*Longurio*) (Fig. 37, venation) — Peru.
stenostylus (Alexander), as *Longurio* (*Longurio*) — Ecuador.
styx (Alexander), as *Longurio* (*Longurio*) — Brazil.
tijucanus (Alexander), as *Macromastix* (*Macromastix*) — Brazil.
travassosanus (Alexander), as *Macromastix* (*Macromastix*) — Brazil.
zikanella (Alexander), as *Longurio* (*Longurio*) — Brazil.

Subgenus *Pehlkea* Enderlein

Pehlkea Enderlein; Zool. Jahrb., Syst., 32: 15; 1912; (type *columbianus* Enderlein; monotypic and original designation).

columbianus (Enderlein), as *Pehlkea* — Colombia.
pallitarsis (Alexander), as *Tanypremna* (*Pehlkea*) — Ecuador.
reginus (Alexander), as *Tanypremna* — Colombia.
regulus (Alexander), as *Tanypremna* (*Pehlkea*) — Ecuador.

Subgenus *Tanypremna* Osten Sacken

Tanypremna Osten Sacken; Biol. Cent. Amer., Diptera, p. 19, pl. 1, fig. 2 (wing); 1886; (type *opilio* Osten Sacken, original designation).
Stegasmonotus Enderlein; Zool. Jahrb., Syst., 32: 11; 1912; (type *longissimus* Enderlein, original designation).

albobasalis sp. n. (Fig. 30, venation) — Venezuela.
aurantiothorax (Alexander), as *Longurio-Tanypremna* (Fig. 31, venation) — Peru.
bezzianus (Alexander), as *Tipula* — Peru.
borgmeieri (Alexander), as *Tanypremna* — Brazil.
calliope (Alexander), as *Tanypremna* — Brazil.

carbonipes (Alexander), as *Tanypremna* — Ecuador.
cerritus (Alexander), as *Tanypremna* — Brazil.
clotho (Alexander), as *Tanypremna* — Brazil.
elegantior (Alexander), as *Tanypremna* — Colombia.
fieldianus (Alexander), as *Longurio-Tanypremna* — Panama.
fuscitarsis (Alexander), as *Tanypremna* — Colombia.
hodgei (Alexander), as *Tanypremna* — Lesser Antilles: Dominica.
horridus (Alexander), as *Tanypremna* — Peru.
incompletus (Alexander), as *Tanypremna* — Venezuela.
invaripes (Alexander), as *Tanypremna* — Brazil.
kadeni (Alexander), as *Tanypremna* — Venezuela.
longipes (Fabricius), as *Tipula* — «South America».
longissimus (Enderlein), as *Stegasmonotus* — Brazil.
manicatus (Osten Sacken), as *Tanypremna* — Brazil.
mirandus (Alexander), as *Tanypremna* — Venezuela.
opilio (Osten Sacken), as *Tanypremna* — Guatemala, Panama, Venezuela.
ornatipes (Alexander), as *Tanypremna* — Brazil.
perornatus (Alexander), as *Tanypremna* — Ecuador, Peru, Venezuela.
phylax (Alexander), as *Longurio-Tanypremna* (Fig. 32, venation) — Peru.
picturellus (Alexander), as *Tanypremna* — Ecuador.
porterianus porterianus (Alexander), as *Tanypremna* — Brazil.
p. limai (Alexander), as *Tanypremna* — Brazil.
proavitus (Alexander), as *Tanypremna* — Brazil.
salome (Alexander), as *Tanypremna* — Brazil.
saltatrix (Alexander), as *Tanypremna* — Costa Rica.
sanctaecatharinae (Alexander), as *Tanypremna* — Brazil.
uniguttatus (Alexander), as *Longurio-Tanypremna* (Fig. 33, venation) — Peru.

Subgenus *Tanypremnella* Alexander

Tanypremnella Alexander; Ann. Mag. Nat. Hist., (11) 1: 339-340, fig. 2; 1938; as *Tanypremna (Tanypremnella);* type *crystallina* (Alexander); original designation.

antenniferus (Alexander), as *Tanypremna* (*Tanypremnella*) — Peru.
crystallinus (Alexander), as *Tanypremna* (*Tanypremnella*) — Ecuador.
gentilis (Alexander), as *Tanypremna* (*Tanypremnella*) — Venezuela.
maldonadoi (Alexander), as *Tanypremna* (*Tanypremnella*) — Venezuela.
mediocornis (Alexander), as *Tanypremna* (*Tanypremnella*) — Ecuador.
megacerus (Alexander), as *Tanypremna* (*Tanypremnella*) — Ecuador.
microcerus (Alexander), as *Tanypremna* (*Tanypremnella*) — Ecuador.
perdistinctus (Alexander), as *Tanypremna* (*Tanypremnella*) — Peru.
segnipes (Alexander), as *Tanypremna* (*Tanypremnella*) (Fig. 34, venation) — Bolivia.
transfasciatus (Alexander), as *Tanypremna* (*Tanypremnella*) — Ecuador.

Subgenus *Tanypremnodes* Alexander

Tanypremnodes Alexander; Ent. News, 35: 290-291; 1924; as *Tanypremna (Tanypremnodes);* type *leucoplaca* (Alexander); monotypic and original designation.

leucoplacus (Alexander), as *Tanypremna* (*Tanypremnodes*) — Brazil.
subapicalis (Alexander), as *Tanypremna* (*Tanypremnodes*) — Brazil.

Subgenus *Xenotipula* Alexander

Xenotipula Alexander; Ann. Mag. Nat. Hist., (9) 8: 171; 1921; (type *munroi* (Alexander), Ethiopian, monotypic and original designation).

cisatlanticus (Alexander), as *Xenotipula* (Fig. 35, venation) — Brazil.

Leptotarsus (Longurio) borgmeieranus sp. n.

Allied to *exemptus;* mesonotum polished dark brown, pleura and pleurotergite light yellow with a transverse brown stripe on mesepisternum; femora yellow, tips brown; wings pale brown, stigma and costal border dark brown, prearcular field and base of cell *R* not darkened; abdominal tergites conspicuously patterned with black and yellow; male hypopygium with inner dististyle slightly decurved at tip, spinoid setae concentrated on a low lobe.

Male. — Length, about 8-8.5 mm.; wing, 9.5-10 mm.; antenna, about 11.5-12 mm. Frontal prolongation of head yellow, without nasus; palpi light brown, terminal segment darker. Antennae of male very long, exceeding the wing; proximal three segments yellow, outer segments brownish black to black; flagellar segments very long-cylindrical, with long erect white setae over the whole length. Head orange yellow.

Pronotum testaceous yellow. Mesonotum polished dark brown, scutellum paler brown, parascutella pale yellow. Pleura and pleurotergite light yellow, including the dorsopleural membrane, mesepisternum with a transverse darkened band. Halteres yellow, knob dark brown. Legs with coxae and trochanters light yellow; femora and tibiae yellow, tips brown, darker and more extensive on femora; tarsi brown. Wings pale brown, cells *C* and *Sc,* with the stigma, dark brown; prearcular field and base of cell *R* not darkened, as in *exemptus;* two conspicuous pale yellow areas, one near outer end of cell *M,* the second on basal half of cells R_3 and R_5; veins brown, darker in costal region.

Abdominal tergites conspicuously patterned with black and yellow, the latter on sides of basal half of segments, leaving black -shaped areas; sternites chiefly yellow, posterior borders of intermediate segments faintly darkened; a narrow subterminal ring, hypopygium yellow. Male hypopygium (Fig. 38) with the tergite, *t,* slightly narrowed outwardly, posterior border shallowly emarginate, with more than the outer half of plate with abundant setae. Dististyles, *d,* terminal, outer style broad, apex obtuse; inner style with apex slightly decurved, obtuse; spinoid setae chiefly in a compact group on a low lobe, with a few others

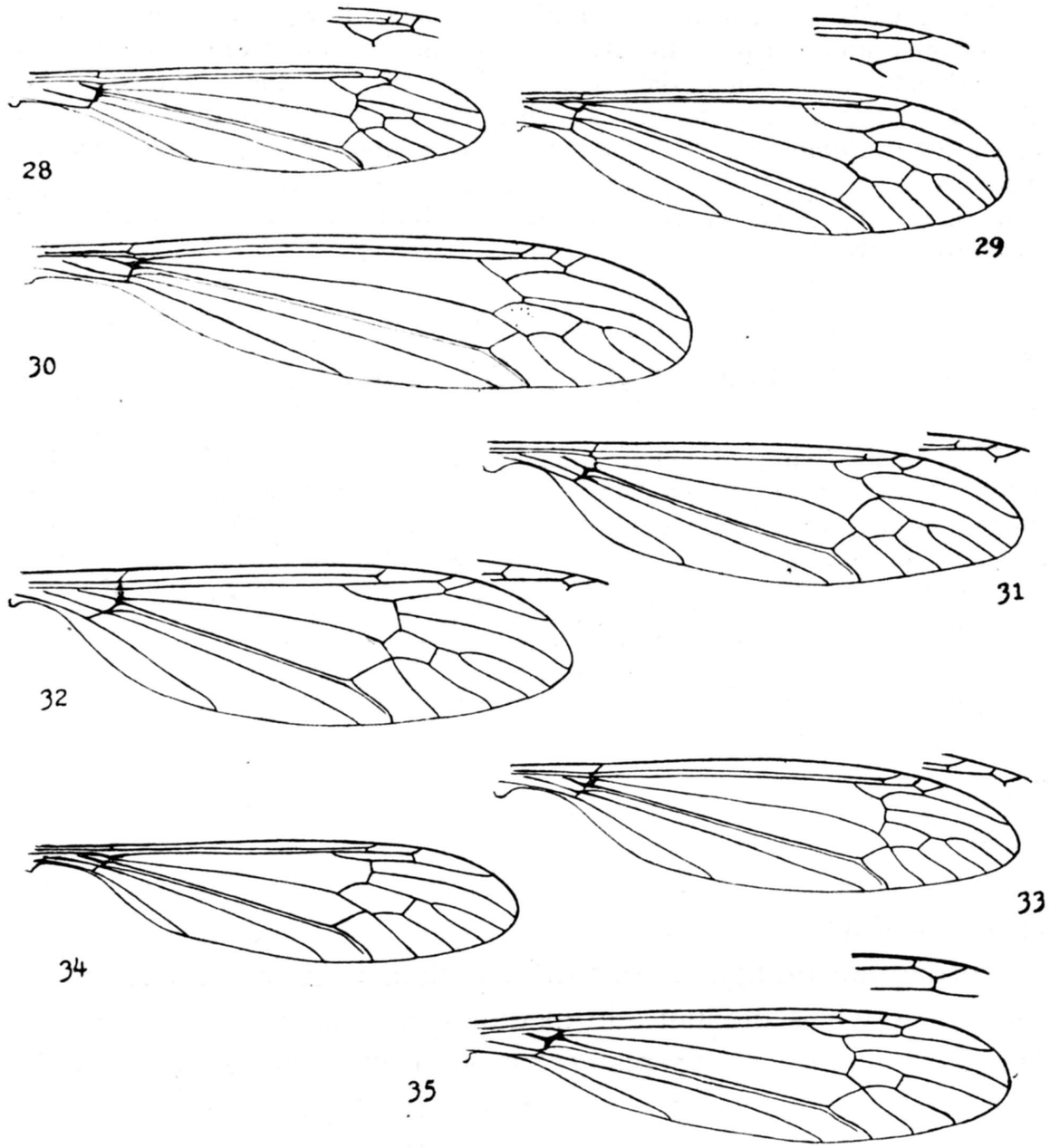

Fig. 28. *Leptotarsus (Ceoneura) idioneura* (Alexander); venation. — Fig. 29. *Leptotarsus (Limoniodes) sulphurella* (Alexander); venation. — Fig. 30. *Leptotarsus (Tanypremna) albobasalis* sp. n.; venation. — Fig. 31. *Leptotarsus (Tanypremna) aurantiothorax* (Alexander); venation. — Fig. 32. *Leptotarsus (Tanypremna) phylax* (Alexander); venation. — Fig. 33. *Leptotarsus* (*Tanypremna*) *uniguttatus* (Alexander); venation. — Fig. 34. *Leptotarsus (Tanypremnella) segnipes* (Alexander); venation. — Fig. 35. *Leptotarsus* (*Xenotipula*) *cisatlanticus* (Alexander); venation.

on disk of style. *Leptotarsus* (*Longurio*) *exemptus* (Fig. 39) differs chiefly in the conformation of the inner dististyle, as shown.

Habitat: Brazil.

Holotype, ♂, Petropolis, Rio de Janeiro, altitude 2,700 feet, April 13, 1940 (Thomas Borgmeier). Paratopotype, ♂.

The species is dedicated to Father Thomas Borgmeier, distinguished entomologist and world authority on various difficult families of insects. All scientists who study the vast insect fauna of the Neotropics are indebted to Father Borgmeier as being the founder and director of the *Revista de Entomologia* and the *Studia Entomologica.* The most similar species is *Leptotarsus* (*Longurio*) *exemptus* (Alexander), differing especially in the wing pattern and in the structure of the hypopygium, as discussed above.

Leptotarsus (Longurio) helota sp. n.

Size small (wing of male 9 mm.); general coloration of mesonotum medium brown; head velvety black, the low vertical tubercle light orange; antennae short; wings strongly infuscated, vein R_{1-2} preserved; abdominal segments bicolored, the sternites more strongly so; male hypopygium with tergal emargination shallow; inner dististyle with spinoid setae elongate, naillike.

Male. — Length, about 12 mm.; wing, 9 mm.; antenna, about 1.1 mm. Frontal prolongation of head light yellow; palpi black. Antennae short; scape brownish yellow, remainder of organ black; first flagellar segment oval, second smaller, remaining segments subcylindrical, shorter than their verticils. Head velvety black, the low vertical tubercle abruptly light orange.

Pronotum orange, center of scutellum infuscated. Mesonotum medium brown, scutellum and mediotergite very sparsely pruinose. Pleura light brown, anepisternum slightly darker. Halteres infuscated. Legs with coxae light brown; trochanters yellow; femora brownish yellow, clearer yellow basally, tips blackened; tibiae brown, tips narrowly black, tarsi brownish black; claws toothed. Wings strongly infuscated, costal border and the small oval stigma slightly darker brown; veins light brown. Veins posterior to *R* glabrous. Venation: R_{1-2} preserved, less strongly upcurved than in *styx;* petiole of cell M_1 slightly longer than *m; m-cu* shortly before fork of M_{3-4}; cell *2nd A* narrower than in *styx.*

Abdomen elongate; tergites vaguely bicolored, black with narrow light brown areas on posterior half of basal rings of intermediate segments, basal tergite brownish yellow; sternites yellow, conspicuously ringed with black on basal rings; segments seven through nine black. Male hypopygium (Fig. 40) with posterior border of tergite, *t,* shallowly emarginate, vestiture relatively short. Outer dististyle, *d,* narrowed at outer end; inner style with body oval, provided outwardly with erect blackened spinoid setae, beak of style decurved, its margin with a row of strong blackened spines.

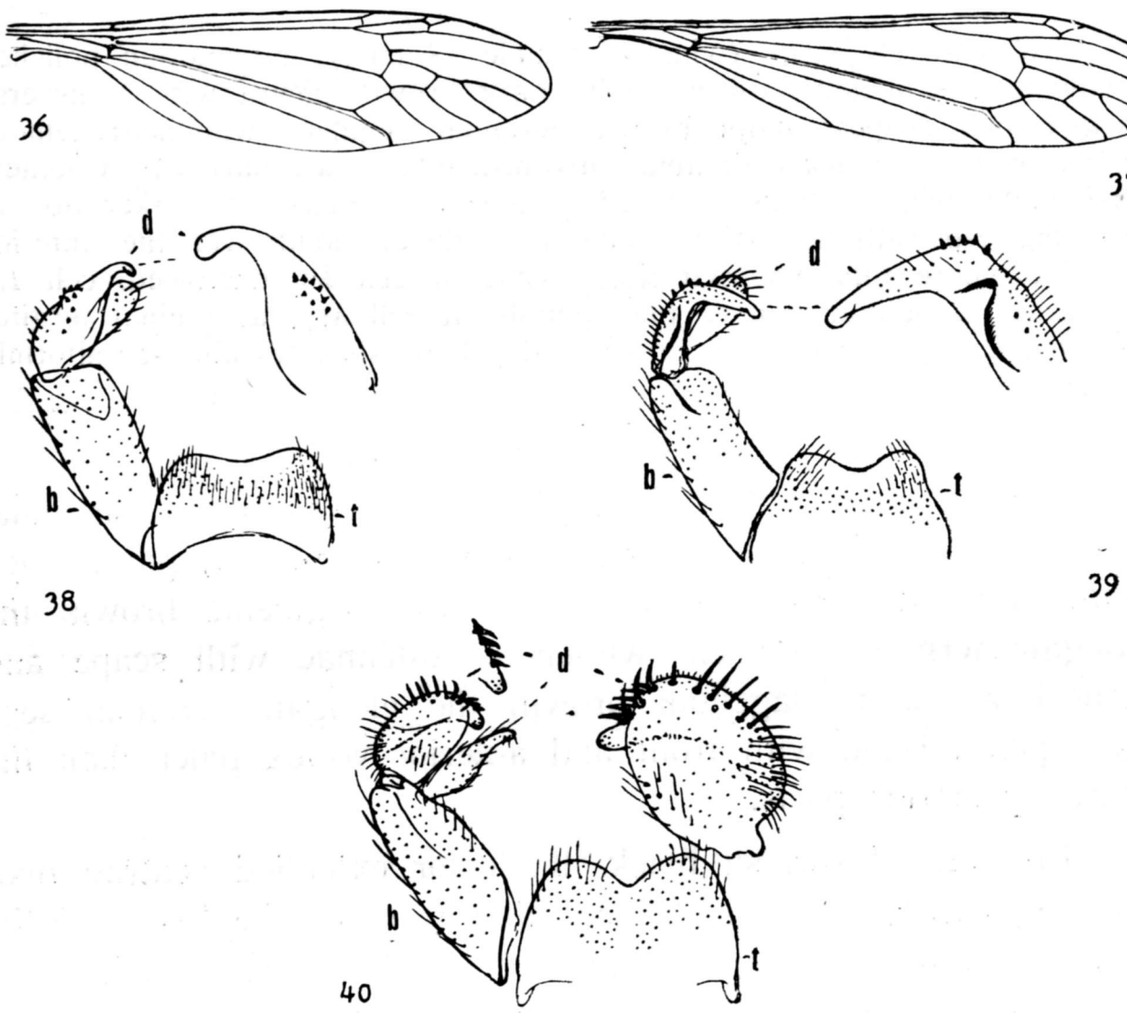

Fig. 36. *Leptotarsus (Longurio) huanucensis* (Alexander); venation. — Fig. 37. *Leptotarsus (Longurio) sessoris* (Alexander); venation. — Fig. 38. *Leptotarsus (Longurio) borgmeieranus* sp. n.; male hypopygium. — Fig. 39. *Leptotarsus (Longurio) exemptus* (Alexander); male hypopygium. — Fig. 40. *Leptotarsus (Longurio) helota* sp. n.; male hypopygium. — Symbols: *b*, basistyle; *d*, dististyles; *t*, tergite.

Habitat: Brazil.

Holotype, ♂, Boracéa, São Paulo, altitude 850 meters, January 30, 1949 (Lauro Travassos).

The only other regional species of the subgenus *Longurio* having the spinoid setae of the inner dististyle of the hypopygium elongate as in the present fly is *Leptotarsus* (*Longurio*) *styx* (Alexander), likewise from southeastern Brazil. This differs in the coloration of the head, thorax, abdomen and legs, in the trichiation of the wing veins, and in hypopygial details, particularly the tergite and inner dististyle.

Leptotarsus (Tanypremna) albobasalis sp. n.

Size relatively large (wing of female 18 mm.); mesonotum polished yellow, conspicuously patterned with dark brown, pleura with transverse dark brown stripes; palpi brown, terminal segment whitened; femora light brown, tips blackened; tibiae brownish black, base narrowly whitened, tarsi white; wings weakly brownish yellow, patterned with darker brown, including especially the stigma and a confluent cloud over the anterior cord; *Rs* more than one-half R_{2-3}, base of cell R_5 narrowed, cell *1st* M_2 large, *m* oblique, longer than petiole of cell M_1; abdominal tergites conspicuously patterned with brown and yellow, sternites almost uniformly yellow.

Female. — Length, about 28 mm.; wing, 18 mm.; antenna, about 1.5 mm. Frontal prolongation of head brown; palpi much longer than the antennae, proximal three segments brown, the elongate terminal segment whitened. Antennae with scape and pedicel yellowed, flagellum brown, the elongate terminal segment paler. Head with front and anterior vertex paler than the brown posterior parts.

Pronotum brownish black, the color extended ventrad over the propleura as a narrow band that includes the bases of the fore coxae. Mesonotal praescutum polished yellow, conspicuously patterned with dark brown, including the anterior end and lateral border behind the humeri, the latter continued ventrad as a narrow transverse stripe that includes the posterior half of the mesepisternum, more intensely brownish black on the dorsopleural membrane, slightly suffusing the anterior face of the middle coxa; posterior sclerites of notum chiefly light brown, parascutella yellow, pleurotergite with a conspicuous dark brown area. Pleura yellow, transversely patterned with brown, as described above. Halteres elongate, stem greenish white, knob darkened. Legs with coxae yellowed, darkened as described; trochanters greenish yellow; femora light brown, more yellowed basally, tips conspicuously black; tibiae brownish black, bases narrowly whitened, slightly less than the darkened femoral apex; tarsi white, terminal segment a little darker. Wings (Fig. 30) weakly brownish yellow, the broad cell *C* clearer yellow; stigma brown, anterior cord with a slightly more extensive darker brown area; outer ends of cells R_2 and R_3 pale brown; veins beyond cord very narrowly and inconspicuously seamed with brown, veins *Cu* and *m-cu* similarly darkened; veins brown, costa tinged with green, especially outwardly. Macrotrichia of outer veins relatively sparse, lacking on veins behind M_2. Venation: Veins Sc_3, free tip of

Sc_2 and R_{1-2} about equally spaced on costa; *Rs* more than one-half R_{2-3}; base of cell R_5 narrowed, *r-m* very short; cell *1st* M_2 large, *m* oblique, longer than the petiole of cell M_1.

Abdominal tergites medium brown, each with a transverse yellow ring beyond base, followed by a darker area that narrowly includes the lateral and posterior borders of the segments; sternites almost uniformly yellow, proximal segments weakly more darkened before apices. Ovipositor with both cerci and hypovalvae long and straight.

Habitat: Venezuela.

Holotype, ♀, Choroni, Aragua, R. Maracay, altitude 980 meters, December 22, 1938 (Anduze).

The most similar species is the larger *Leptotarsus* (*Tanypremna*) *miranda* (Alexander), likewise from Venezuela, the two flies differing evidently in the details of coloration of the body, legs and wings, and in the venation. *L.* (*T.*) *kadeni* (Alexander) also is related but is more distinct in coloration and venation.

Megistocera Wiedemann

Maekistocera Wiedemann; Dipt. exotica, part 1: 41; 1820.
Megistocera Wiedemann; Aussereur. zweifl. Ins., 1: 55; 1828; (type *Tipula filipes* Fabricius; designated by Macquart, 1838: 63); Ethiopian.
The prior name *Maekistocera* was arbitrarily rejected by its author and the later one proposed and is now generally accepted.

Two recent members of the genus are known, including the Old World *Megistocera filipes,* represented by two geographical races or clines, the typical *filipes* being wide-spread in Africa while the race *fuscana* Wiedemann has a vast range in Australasia and South Asia, occurring as far west as southern India. In this species the antennae of the male are greatly lengthened whereas in the New World species, here discussed, the antennae are very short in both sexes, with only eight segments (Fig. 5) As was indicated under the genus *Brachypremna,* it appears that the Baltic Amber (Upper Eocene) *Macromastix bornhardti* Meunier is more properly placed in the present genus and emphasizes the affinities between the two genera.

In *Megistocera* and to a lesser degree in *Brachypremna,* the wings (Fig. 2) have veins Sc_1 and Sc_2 closely approximated at costa, closing cell Sc_1 or virtually so. A peculiarity of the venation is the strongly angulated vein R_{2-3} which in some cases has a short spur at the angle, lying along the proximal edge of the stigma. A second venational feature is the course of vein M_4 at its base, where it is directed strongly backward and thence extended to the margin at a slightly acute angle, with *m-cu* at

the point of angulation. Both species of *Megistocera* have the outer ends of veins M_2, M_3 and M_4 pale to subatrophied, a condition found also in *Brachypremna,* and emphasizing the relationships between the two groups. Cell *2nd A* of the wings is very narrow in the local species, much broader in *filipes*. The legs in both sexes are excessively long and slender, especially the middle and hind pairs where the basitarsi alone are nearly twice the remainder of the tarsi and equal to or longer than the wing.

The habits of the adult flies and the immature stages have been discussed in an outstanding paper by J. S. Rogers (Univ. Michigan, Occas. Pap. Mus. Zoology, No. 521: 1-14, 2 pls. with 7 figs. 1949). The remarkable flight of the adults, as described in this report, has been observed in a somewhat similar manner in *Megistocera filipes fuscana* in New Guinea by Dr. Jean Laffoon (in litt.). The immature stages of *M. longipennis* are aquatic, occurring close to the surface film in quiet water bodies, the larvae living in detached sections of hollow plant stems floating at the surface, in this habit suggesting the larval cases of certain Trichoptera. As larval growth proceeds, successively larger stems are utilized and pupation occurs in one end of the final tube.

List of Species

longipennis (Macquart), as *Tipula* (Fig. 2, venation; Fig. 5, ♂ antenna).
Syn. *tenuis* (van der Wulp), as *Tipula* — Surinam.
Southeastern United States, south to Argentina and Bolivia; Greater Antilles.

Nephrotoma Meigen

Nephrotoma Meigen; Mag. für Insektenkunde, 2: 262; 1803; (type *dorsalis* (Fabricius); Palaearctic, monotypic).
Pales Meigen; Nouv. Class. Mouches à deux ailes, p. 14; 1800 (name suppressed by Internat. Comm. Zool. Nomencl., 1963: 339).
Pachyrhina Macquart, Hist. nat. des Insectes, Diptères, p. 88; 1834: (type *crocata* Linnaeus, designated by Westwood, 1840: 128); emended spellings include *Pachyrina, Pachyrhyna, Pachyrrhina.*

Nephrotoma is a major genus with numerous species occurring chiefly throughout the Holarctic and Ethiopian regions, with relatively few recorded from the Neotropics to the present time. It seems certain that many additional species will be found, including several presently being studied by Dr. George W. Byers.

Important recent papers on the taxonomy and biology of the genus include the following.

Alexander, C. P., South African Animal Life, 10: 265-281, 2 figs.; 1964 (Lund). — Southern Ethiopian.
— Ruwenzori Expedition, 1934-35, 1, no. 7: Tipulidae, 135-164, 31 figs.; 1956 (London). — Tropical Ethiopian.
Brindle, Allan, Trans. Soc. British Ent., 14: 63-114, 179 figs. European, Immature stages.
Dietz, W. G., Trans. Amer. Ent. Soc., 44: 105-140, 4 pls. (with 34 figs.); 1918. — Nearctic.
Doane, R. W., Ent. News, 19: 173-179; 1908. — Nearctic.
Mannheims, Bernhard, *In* Erwin Lindner, Die Fliegen der Palaearktischen Region. Lief. 167: 32-59, figs. 10-26, pl. VI; 1951. — Western Palaearctic.
Theowald, Br., Die Entwicklungs-stadien der Tipuliden (Diptera, Nematocera) insbesondere der West-Palaearktischen Arten, pp. vii-xi, 195-308, 332 figs.; 1957. — Immature stages.
— Bestimnungsbücher zur Bodenfauna Europas, Lief. 7, Tipulidae, 1-100, 344 figs.; 1967. — Immature stages of European species.

The immature stages are found in soil, commonly beneath a layer of leaf mold. Certain species are of some economic importance, particularly to agriculture (Brindle, Theowald references above).

List of Species

affinis (Bellardi), as *Tipula* — Mexico (identiy uncertain).
alleni (Alexander), as *Pachyrhina* — Colombia.
aurocomata sp. n. — Ecuador.
boliviana Alexander — Bolivia.
cacuminis Alexander — Ecuador.
circumscripta (Loew), as *Pachyrrhina* — Cuba, Jamaica.
consularis consularis (Osten Sacken), as *Pachyrrhina.* — Costa Rica, Nicaragua; Argentina, Brazil, Paraguay.
c. eminens Alexander — Venezuela.
dampfi Alexander — Mexico.
durangensis Alexander (Fig. 44, ♂ hypopygium) — Mexico.
elegans (Fabricius), as *Tipula* — «South America» (identity uncertain).
elegantula (Williston), as *Pachyrrhina* — Lesser Antilles: St. Vincent.
ferruginea ferruginea (Fabricius), as *Tipula* — North America, south to Mexico.
Syn. *proxima* (Bellardi), as *Tipula;* auct. Osten Sacken. — Mexico.
quadrilineata (Macquart), as *Pachyrhina,* auct. Osten Sacken. — Mexico.
glabricristata Alexander. — Cuba, Haiti; Dominica.
globosa sp. n. — Colombia.
lateropolita Alexander — Costa Rica.
medioligula Alexander — Colombia, Venezuela.
melanoxantha Alexander (Fig. 41, venation). — Bolivia.
mexicana (Macquart), as *Pachyrhina* — Mexico (identity uncertain).
nigrolutea (Bellardi), as *Tipula* — Costa Rica, Mexico.

nigropilosa sp. n. — Peru.
ordinaria (Osten Sacken), as *Pachyrrhina* — Mexico.
pulchella (Rondani), as *Pachyrhina* — Brazil.
punctifrons (Macquart), as *Pachyrhina* — Argentina, Brazil.
sparsicoma sp. n. — Ecuador.
triobtusa sp. n. — Brazil.
usta (Osten Sacken), as *Pachyrrhina* — Costa Rica.

Doubtful species: *elongata* (Macquart), as *Pachyrhina.* — Country unknown, possibly Neotropical.

Nephrotoma aurocomata sp. n.

General coloration yellow, conspicuously patterned with black, including the head and thorax; antennae entirely black; wings fulvous brown, cells *C* and *Sc* more yellowed; male hypopygium with the outer basal lobe of the inner dististyle extended into a long slender spine; posterior border of eighth sternite conspicuously emarginate, with a broad obtuse central plate, the lateral lobes with abundant incurved golden yellow setae.

Male. — Length, about 12-13 mm.; wing, 10.5-12 mm.; antenna, about 3.8-4 mm.

Female. — Length, about 14 mm.; wing, 14 mm.

Frontal prolongation of head brownish yellow, narrowly black above, including the nasus; palpi brownish black, terminal segment black. Antennae black throughout; flagellar segments moderately incised, slightly exceeding the longest verticils. Head orange, the elevated vertical tubercle more yellowed, incised medially; occipital brand large and broad, shiny nacreous, anteriorly with a dull black central extension that is contiguous with large black lateral areas; head with conspicuous black setae, those of the genae very long.

Pronotum black, scutum medially broadly light yellow. Mesonotal praescutum yellow with three polished black stripes, the median one reaching the suture behind, lateral pair outcurved to margin, not opaque; scutum yellow, each lobe with two confluent black areas that are extended across the suture; scutellum brownish black, parascutella light yellow, darkened laterally; central part of mediotergite broadly blackened, expanded and slightly paler behind, pleurotergite blackened, the more elevated katapleurotergite yellowed. Pleura black, conspicuously variegated with yellow, including the posterior anepisternum and pteropleurite, dorsal sternopleurite and meron, and much of the metapleura. Halteres yellow. Legs with fore coxae brownish black, midcoxae yellowed anteriorly, dark brown behind, posterior coxae more uniformly yellow; trochanters dull orange; femora obscure

yellow to brownish yellow, tibiae passing into brown; tarsi black, claws of male toothed. Wings fulvous brown, cells *C* and *Sc,* with vein *Cu,* more yellowed, base of cell *2nd A* slightly more infuscated; stigma light brown, with macrotrichia. Very sparse trichia in outer end of cell R_5. Venation: Cell M_1 sessile to short-petiolate; *m-cu* at or close to fork of M_4.

Abdomen yellowed, posterior borders of tergites pale brown, the amount increasing on outer segments, in male including the outer four segments; genital segment of female yellowed. Male hypopygium (Fig. 42) with the tergite, *t,* transverse, outer margin rounded, posterior border with a circular emargination, the conspicuous lobes with blackened spicules, including two or three larger marginal points and with a concentration of smaller spinoid setae at mesal end of lobe. Outer dististyle, *d,* broadest before midlength, narrowed to the obtuse tip; inner style with beak pale, narrower in the holotype, tip obtuse, lower beak blackened; outer basal lobe yellow basally, extended into a long slender black spine. Eighth sternite, *8 s,* large, sheathing, posterior border conspicuously emarginate, with a broad obtuse central plate, the large lateral lobes with abundant long incurved golden yellow setae to form conspicuous brushes.

Habitat: Ecuador.

Holotype, ♂, Banos, Tungurahua, altitude 2,200 meters, October 15, 1938 (Macintyre). Allotopotype, ♀, with type. Paratypes, 1 ♂, 1 ♀, Upper Rio Topo, Tungurahua, altitude 1,500 meters, February 1949 (Velastegui); 2 ♂♂, Yunguilla, Napo-Pastaza, altitude 1,700 meters, May 1944 (Velastegui).

In its general appearance, especially the wing coloration, the present fly is most similar to *Nephrotoma usta* (Osten Sacken), of Central America, differing in many details of coloration. The male hypopygium of *usta* is not available to me for comparison and was not described by Osten Sacken.

Nephrotoma cacuminis Alexander

Nephrotoma cacuminis Alexander; Ann. Mag. Nat. Hist., (11) 12: 753-755; 1945.

General coloration of thorax yellow, the praescutum with three black stripes, the polished lateral pair extended to the margin in front and again at the suture to enclose a small lateral yellow ground area, scutellum black, postnotum and pleura

yellow, patterned with brownish black. Wings whitened, stigma brown, with about 20 trichia. Abdomen yellow, basal segments restrictedly patterned with brown, outer segments extensively brownish black to form a broad ring. Male hypopygium (Fig. 43) with outer basal lobe of inner dististyle, *d,* very short, terminating in an equally short blackened spine, dorsal crest very low. Eighth sternite, *8s,* with a median ligula that is surrounded by long yellow setae.

The types were from Morro Morro, El Oro, Ecuador, collected by David Laddey. A further male from Balzapamba, Bolivar, altitude 700 meters, taken June 4, 1938, by Macintyre.

Nephrotoma globosa sp. n.

Antennae black, proximal segments slightly paler; frontal prolongation of head light yellow, broadly black above; posterior part of head conspicuously patterned with black; mesonotal praescutum light yellow with three polished black stripes, outer pair outcurved, remainder of notum and the pleura conspicuously patterned with black; wings brownish yellow, prearcular and costal fields clearer orange yellow; abdomen yellow, conspicuously ringed with black, including the broad apices of the tergites and narrower margins of sternites, eighth tergite yellow; male hypopygium with beak of inner dististyle very short and obtuse, outer basal lobe a small rounded black knob; eighth sternite with posterior border shallowly emarginate, with abundant short yellow setae.

Male. — Length, about 13.5 mm.; wing, 10.5 mm.; antenna, about 3 mm. Frontal prolongation of head light yellow, broadly black above, including the nasus; palpi brownish black, terminal segment black. Antennae with proximal three segments brownish black, remainder black; segments short, the basal enlargements subequal to the remainder of segment. Head yellow, the globular vertical tubercle light yellow; occipital brand polished nacreous, bordered by velvety black, sending a point cephalad onto the tubercle; anterior vertex with large dull black areas adjoining the eye, almost confluent with the vertical darkening, posterior parts of head blackened.

Pronotum medially light yellow, sides broadly blackened. Mesonotal praescutum light yellow with three polished black stripes, the lateral pair with very narrow blackened margins, at outer end with a large opaque black spot to appear outcurved; further blackenings along suture and at lateral border completely enclose a triangular ground area before the suture; scutum yellow, lobes extensively blackened; scutellum black, parascutella yellow,

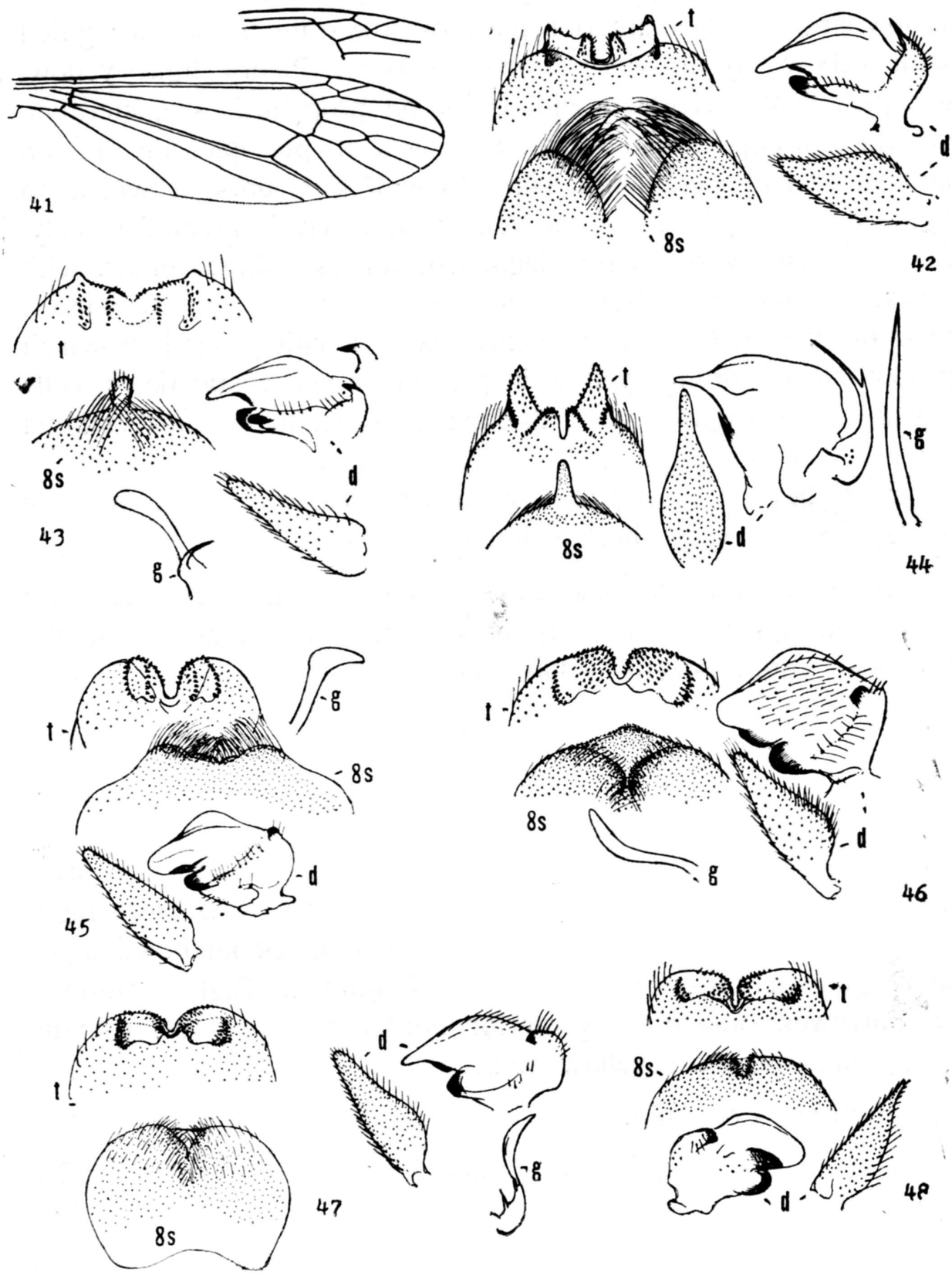

Fig. 41. *Nephrotoma melanoxantha* Alexander; venation. — Fig. 42. *Nephrotoma aurocomata* sp. n.; male hypopygium. — Fig. 43. *Nephrotoma cacuminis* Alexander; male hypopygium. — Fig. 44. *Nephrotoma durangensis* Alexander; male hypopygium. — Fig. 45. *Nephrotoma globosa* sp. n.; male hypopygium. — Fig. 46. *Nephrotoma nigropilosa* sp. n.; male hypopygium. — Fig. 47. *Nephrotoma sparsicoma* sp. n.; male hypopygium. — Fig. 48. *Nephrotoma triobtusa* sp. n.; male hypopygium. — Symbols: *d*, dististyles; *g*, gonapophysis; *s*, sternite; *t*, tergite.

narrowly blackened posteriorly; mediotergite black, with a large yellow area at each anterior part, pleurotergite black, variegated with yellow on anterior katapleurotergite. Pleura light yellow, conspicuously variegated with black on propleura, anepisternum, ventral sternopleurite, dorsal and ventral pteropleurite, meron and on part of metapleura. Halteres with stem dark brown, knob light yellow. Legs with coxae yellow, narrowly infuscated basally, more extensively so on fore legs; trochanters orange yellow, with blackened pattern; femora medium brown, tibiae slightly darker, tarsi black, claws of male toothed. Wings with ground brownish yellow, clearer orange yellow in prearcular and costal fields, cells beyond cord slightly more darkened, especially at tips; stigma brown, with about 15 trichia; veins light brown on basal half of wing, beyond cord brownish black. Venation: *m-cu* at fork of *M;* cell M_1 very short-petiolate.

Abdomen yellow, conspicuously ringed with black, including the broad apices of the tergites and narrower margins of the sternites; eighth tergite yellow, eighth sternite brownish black, remainder of hypopygium variegated black and yellow. Male hypopygium (Fig. 45) with posterior border of tergite, *t,* deeply emarginate to form two rounded lobes, each with relatively numerous blackened spicules arranged chiefly in two transverse rows. Outer dististyle, *d,* narrowed on outer fourth; inner style short and compact, beak very short, obtuse; dorsal crest high, glabrous; outer basal lobe a small rounded black knob. Gonapophysis boomerang-shaped, outer half dilated. Eighth sternite, *8s,* narrowed outwardly, posterior border shallowly emarginate, with abundant short yellow setae.

Habitat: Colombia.

Holotype, ♂, Manizales, altitude 3,500 meters, December 23, 1958 (Juan Foerster).

Nephrotoma globosa is generally similar to *N. consularis* (Osten Sacken), differing in details of coloration of the antennae, thorax and abdomen, and in hypopygial structure.

Nephrotoma nigropilosa sp. n.

General coloration of thorax yellow, praescutum with three polished brownish black stripes, pleura with more reddish brown areas; antennae black, scape light yellow; wings yellowed basally, less distinctly so beyond cord; abdomen yellow, posterior borders of segments brownish black, with abundant relatively short black setae; eighth sternite darkened, remainder of hypopygium yellow; beak of inner dististyle obtuse, outer basal lobe subquadrate, blackened; eighth sternite with posterior border emarginate, with abundant golden yellow setae.

M a l e. — Length, about 13 mm.; wing, 10.8 mm.; antenna, about 2.7 mm.

F e m a l e. — Length, about 15 mm.; wing, 12 mm.

Frontal prolongation of head light yellow, including the nasus, the latter tufted with long black setae; palpi yellow, terminal segment black. Antennae of male short; scape light yellow, remainder black; flagellar segments only moderately incised. Head with anterior vertex light yellow, vertical tubercle entire; a small black spot adjoining eye; occipital brand broad, polished black; posterior vertex with abundant black setae.

Pronotum light yellow, sides narrowly blackened. Mesonotal praescutum yellow, with three polished brownish black stripes, lateral pair outcurved to margin as a more intensely blackened spot; lateral end of suture and posterior lateral border narrowly black; scutum light yellow, each lobe with two confluent brownish black areas; scutellum brownish black, parascutella light yellow; mediotergite yellow with a central brownish black stripe that is widened posteriorly; pleurotergite brown, the katapleurotergite yellow. Pleura yellow with reddish brown areas, most evident on ventral sternopleurite and meron; propleura yellow, Halteres dark brown, base of stem obscure orange, knob clear orange. Legs with coxae and trochanters yellow; femora yellow, more darkened apically; tibiae brownish black, tarsi black; claws of male toothed. Wings yellowed basally, less distinctly so beyond cord, veins black, those before cord yellow; stigma pale brown, with about 15 trichia. Venation: Cell M_1 narrowly sessile.

Abdomen yellow, posterior borders of tergites brownish black, the color in part produced by very numerous relatively short black setae; eighth sternite more uniformly darkened, hypopygium yellow. In the female the blackened setae restricted to segments two to five, beyond this with normal longer yellow setae. Ovipositor with tips of cerci narrowly obtuse. Male hypopygium (Fig. 46) with blackened spinoid setae of tergal lobes,

t, numerous. Outer dististyle, *d,* with outer half narrowed; inner style with beak broadly obtuse, narrowly blackened on lower margin, lower beak broadly rounded, black; dorsal crest moderately developed; outer basal lobe subquadrate, blackened. Gonapophysis slender, outer half slightly broader, tip obtuse. Eighth sternite, *8s,* with posterior border emarginate, with abundant golden yellow setae, median part of each lobe with very abundant shorter yellow setae; emargination with membrane densely provided with small circular areas that bear microscopic setae.

Habitat: Peru.

Holotype, ♂, Tingo Maria, April 5-8, 1963 (L. E. Pena). Allotopotype, ♀, pinned with type. Paratopotype, one, ♀, pinned beneath allotype.

Nephrotoma nigropilosa is generally similar to some other regional species, being best distinguished by the vestiture of the abdomen and in hypopygial structure, particularly the inner dististyle and eighth sternite.

Nephrotoma sparsicoma sp. n.

General coloration of thorax yellow, conspicuously patterned with black; praescutal stripes polished, the laterals outcurved to margin; femora yellow, tips narrowly darkened; abdomen orange, posterior borders of tergites narrowly darkened; male hypopygium with eighth sternite with relatively few short yellow setae.

Male. — Length, about 13 mm.; wing, 11 mm.; antenna, about 3.2 mm.

Female. — Length, about 13.5 mm.; wing, 12 mm.

Frontal prolongation of head light yellow, above more fulvous, including the conspicuous nasus that is fringed with long black setae; proximal three segments of palpi yellow, the terminal one brown, passing into black. Antennae with scape yellow, pedicel brown, flagellum black; flagellar segments only moderately incised, slightly exceeding the longest verticils. Head light yellow; occipital brand and a small spot adjoining eye blackened.

Pronotum yellow, sides blackened. Mesonotal praescutum yellow, with three polished black stripes, lateral pair straight but with a more intensely blackened area at its anterior end, reaching the suture and contiguous with a smaller similar spot on dorsopleural membrane; scutum yellow, each lobe with a single polished black area, anterior and lateral parts, including the suture, more intensely black; scutellum black, parascutella yellow; mediotergite black, the broad anterolateral part light yellow; kata-

pleurotergite yellow, anapleurotergite black. Pleura yellow, variegated with black, including the propleura, ventral anepisternum and sternopleurite, and more restricted areas on anterior pteropleurite and ventral meron. Halteres brownish yellow, base of knob slightly more darkened. Legs with all coxae and trochanters ferruginous yellow; femora yellow, tips narrowly darkened, tibiae brownish yellow, darker outwardly; tarsi black, claws of male toothed. Wings brownish yellow, prearcular and costal fields more saturated yellow, especially cell *Sc;* stigma medium brown, with about 20 trichia; veins brown, *Sc, R,* and *Cu,* with the prearcular veins, more yellowed. Venation: Cell M_1 very short-petiolate to barely sessile; *m-cu* just before fork of M_4.

Abdomen orange, posterior borders of segments narrowly darkened, the actual margins black; second tergite with a central black spot on anterior half, sternites more uniformly yellow, eighth sternite extensively brownish black, the borders and central area yellowed, remainder of hypopygium yellow. Male hypopygium (Fig. 47) with lobes of tergite, *t,* low, rounded, the small blackened spinules arranged in two groups, those of lateral area more concentrated. Inner dististyle, *d,* with beak relatively slender, unblackened except along lower margin adjoining the obtuse lower beak; outer basal lobe small, obtuse, with a blackened point, base with four or five long erect setae; gonapophysis a twisted yellow blade, near its base with a slender spine. Eighth sternite, *8s,* large and sheathing, posterior border with a small incision that is fringed with few inconspicuous yellow setae.

Habitat: Ecuador.

Holotype, ♂, Puyo, Napo-Pastaza, January 1949 (Velastegui). Allotopotype, ♀, pinned with type.

The hypopygium of the present fly is much as in *Nephrotoma triobtusa* sp. n., of southeastern Brazil, differing especially in the structure of the inner dististyle, including the much more slender beak.

Nephrotoma triobtusa sp. n.

General coloration of praescutum yellow with three chestnut brown stripes, the lateral pair outcurved; head dull orange, occipital brand large, margined with paler brown; legs obscure yellow; wings weakly darkened, prearcular and costal fields brownish yellow, stigma pale brown; basal abdominal tergites bicolored, yellow, apices brownish black; male hypopygium with beak of inner dististyle very obtuse, dorsal crest low, glabrous, outer basal lobe small, obtuse; eighth sternite large, narrowed outwardly, posterior border with a very small central pocket that is provided with small yellow setae.

Male. — Length, about 11 mm.; wing, 8 mm. Frontal prolongation of head yellowed above, darker on sides; palpi obscure yellow, setae dark. Antennae with scape and pedicel yellowish brown; flagellum broken. Head dull orange; occipital brand large, dark brown, anterior end pointed, margins paler brown, the color extended anteriorly to the vertical tubercle.

Pronotum yellow, darkened laterally. Mesonotal praescutum yellow, with three chestnut brown stripes, the median one broad in front, lateral pair outcurved to margin, the anterior end more expanded, darker, polished; scutum yellow medially, lobes almost uniformly brown; scutellum dark brown, parascutella yellowed; mediotergite yellow, with a V-shaped pale brown area; pleurotergite brown, katapleurotergite extensively yellowed. Pleura yellowed, inconspicuously patterned with pale brown, dorsopleural membrane yellow. Halteres with stem brownish yellow, knob clearer yellow. Legs with coxae and trochanters yellow, posterior coxae more infuscated; remainder of legs obscure yellow, outer tarsal segments darker. Wings weakly darkened, prearcular and costal fields more brownish yellow, stigma pale brown; veins pale brown. Stigma with about seven trichia, all in cell R_1. Venation: Cell M_1 narrowly sessile; *m-cu* shortly before fork of M_4.

Abdominal tergites bicolored, yellow basally, apices brownish black, the amount of the latter increasing on outer segments where the bases likewise are narrowly darkened; sternites and hypopygium more yellowed, eighth sternite light brown. Male hypopygium (Fig. 48) with the tergite, *t*, transverse, posterior border with a very narrow median emargination, the broad lateral lobes transverse, with small blackened spinoid setae at either end of the plate. Outer dististyle, *d*, relatively short, the apex suddenly narrowed to a point; inner style with beak, lower beak and outer basal lobe all obtuse apically, apex of beak pale, the remainder darkened; dorsal crest low, glabrous. Eighth sternite, *8s*, large, narrowed outwardly, posterior border virtually entire, with a very small central pocket provided with relatively abundant yellow, inconspicuous setae, the other setae of sternite long and black, very numerous on outer three-fourths of plate.

Habitat: Brazil.

Holotype, ♂, Rio Negro, Paraná, November 21, 1944 (M. Witte).

The species is most readily told from regional allies by the hypopygial characters, especially the inner dististyle and eighth sternite.

Ozodicera Macquart

Ozodicera Macquart; Hist. nat. Insectes Dipteres, 1: 92; 1834; (type *pectinata* (Wiedemann), as *ochracea* Macquart; monotypic).
Hemicteina Westwood; Zool. Jour., 5: 450; 1835; (type *gracilis* Westwood; monotypic).

Ozodicera is one of the major Tipuline genera in Tropical America and appears to be unusually distinct from its nearest relatives in Australia. The most distinctive characters are found in the antennae which are branched in both sexes but to a lesser degree in the female (Figs. 51, 52). In the male of the typical subgenus there commonly is a single short branch on each of flagellar segments two through seven, whereas in the subgenus *Dihexaclonus* there are two such branches. There is some deviation in this number of branched segments, in *schwarzmaierana* there being only five segments so involved while in *macracantha* and *neivai* there are seven. Certain species that are assigned to *Dihexaclonus* show considerable modification in the shape and arrangement of the two branches or spurs. Normally both branches arise close together on the segment, with their bases contiguous or barely united. In some, as *spilophaea* and *umbrifera,* the branches are unequal with the shorter projection arising from the larger branch beyond its base, in *extensa* with the spur at near one-third the length, in *strohmi* beyond midlength, while in *noctivagans* the branch is represented only by a smaller tubercle shortly before the apex. In the extreme case it is difficult to assign the species to either of the recognized subgenera.

The male hypopygium of certain species are conspicuously modified, providing strong specific characters (Figs. 53-55). The wings commonly are almost unicolorous but in some species are conspicuously and attractively patterned. The venation is shown (Fig. 49).

List of Species

Subgenus *Ozodicera* Macquart

attenuata Alexander — Brazil.
bimaculata Enderlein — Brazil.
bispinifera Alexander — Brazil.
carrerella Alexander — Brazil.
caudifera Alexander — Brazil.
cinereipennis Alexander (Fig. 52, antenna ♂) — Brazil.
corrientesana Alexander — Argentina.
cygniformis Alexander — Ecuador.
duidensis Alexander — Venezuela.
eliana Alexander — Brazil.

epicosma Alexander — Brazil.
eurystyla Alexander (Fig. 49, venation) — Peru.
extensa Alexander — Brazil.
gracilis (Westwood), as *Hemicteina* — Brazil.
griseipennis Loew — Brazil.
longimana (Fabricius), as *Tipula* — «South America».
multiermis Alexander — Ecuador.
nigromarginata Alexander — Brazil.
noctivagans Alexander — British Guiana.
(*ochracea* Macquart — see *pectinata* Wiedemann).
pectinata (Wiedemann), as *Tipula* — British Guiana.
Syn. — *ochracea* Macquart — «South America».
phallacantha Alexander — Peru.
piatrix Alexander — Ecuador.
placata Alexander — Peru.
schwarzmaierana Alexander — Brazil.
septemtrionis Alexander — Mexico.
simplex (Walker), as *Ptilogyna* — «South America».
striatipennis Alexander — Venezuela.
strohmi Alexander — Brazil.
subvittata Alexander — Brazil.
thaumasta Alexander (Fig. 55, ♂ hypopygium) — Peru.
trispinifera Alexander — Ecuador.
witteana Alexander — Brazil.
zikaniana Alexander — Brazil.

Subgenus *Dihexaclonus* Enderlein

Dihexaclonus Enderlein; Zool. Jahrb., Syst., 32: 28; 1912; (type *apicalis* Macquart; original designation).

apicalis Macquart — Brazil.
biaculeata Alexander (Fig. 53, ♂ hypopygium) — Peru.
effecta Alexander — Brazil.
fumipennis Loew — Brazil.
gracilirama Alexander — Bolivia.
guianensis Alexander — British Guiana.
jesseana Alexander — Brazil.
lanei Alexander — Brazil.
longisector Alexander — Venezuela.
macracantha Alexander (Fig. 51, ♂ antenna) — Brazil.
neivai Alexander — Brazil.
panamensis Alexander — Panama.
perfuga Alexander — Brazil.
pumila Alexander — Brazil.
spilophaea Alexander — Peru.
superarmata Alexander — Brazil.
telestyla sp. n. — Colombia.
terrifica Alexander — Brazil.
triguttata Alexander — Brazil.
tripallens Alexander — Brazil.
umbrifera Alexander — Brazil.
xanthostoma Loew — Brazil.

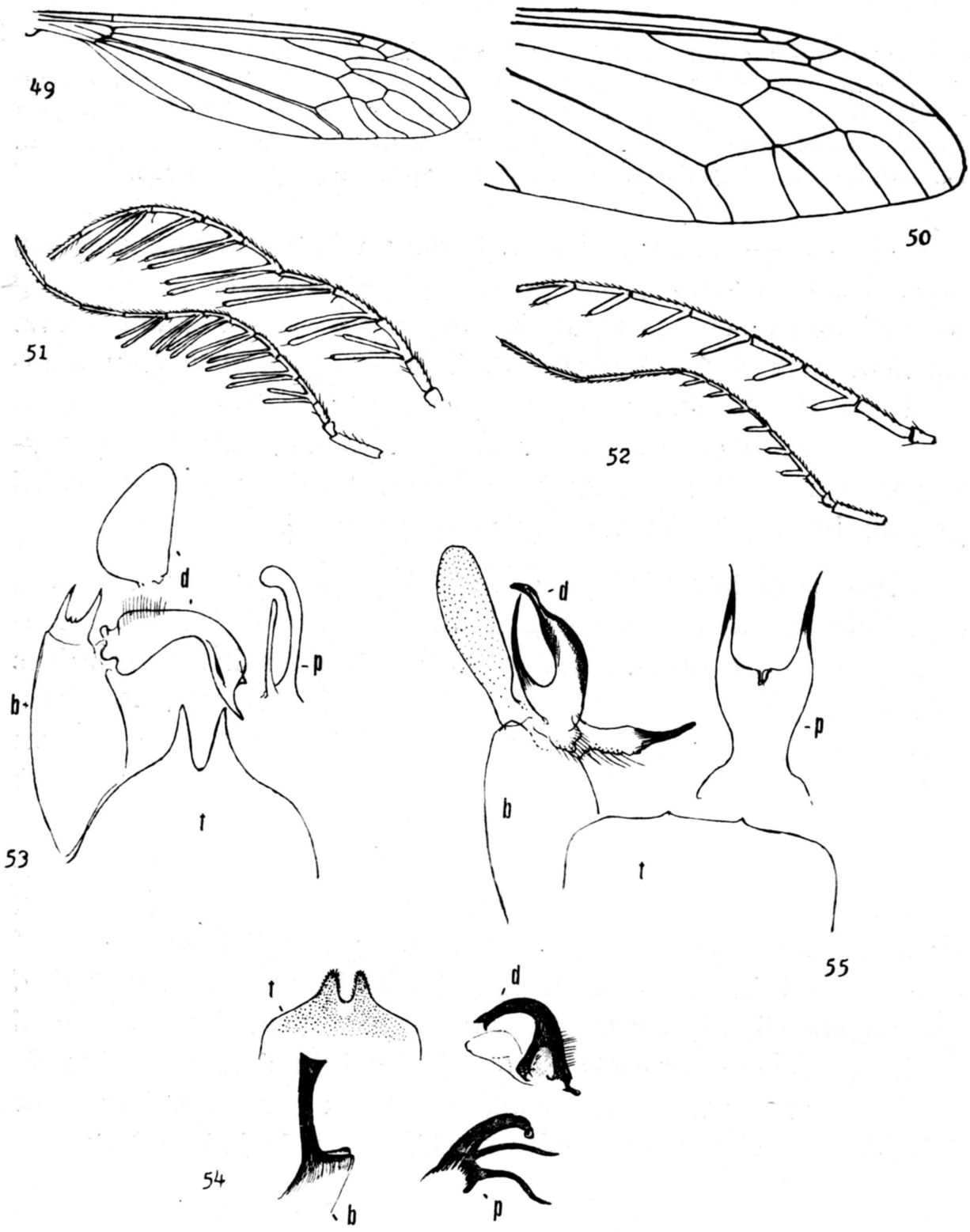

Fig. 49. *Ozodicera (Ozodicera) eurystyla* Alexander; venation. — Fig. 50. *Phacelodocera flabellifera* (Loew); venation. — Fig. 51. *Ozodicera (Dihexaclonus) macracantha* Alexander; male antenna. — Fig. 52. *Ozodicera (Ozodicera) cinereipennis* Alexander; male antenna. — Fig. 53. *Ozodicera (Dihexaclonus) biaculeata* Alexander; male hypopygium. — Fig. 54. *Ozodicera (Dihexaclonus) telestyla* sp. n.; male hypopygium. — Fig. 55. *Ozodicera (Ozodicera) thaumasta* Alexander; male hypopygium. — Symbols: *b*, basistyle; *d*, dististyles; *p*, phallosome; *t*, tergite.

Ozodicera (Dihexaclonus) telestyla sp. n.

General coloration of mesonotal praescutum obscure yellow, with four reddish brown stripes; flagellar branches subequal in length to the segments; wings strongly tinged with brown, prearcular field and stigma slightly darker brown; male hypopygium with apex of basistyle produced caudad into a long flattened blade, its apex slightly expanded.

Male. — Length, about 21 mm.; wing, 16 mm.; antenna, about 5 mm. Frontal prolongation of head elongate, nearly equal to the remainder, chestnut brown, nasus short; palpi black. Antennae with scape elongate, dark brown, pedicel yellow; branched flagellar segments brownish yellow with dark brown branches; terminal simple segments elongate, black; branches of segments short, equal, subequal in length to the segments. Head grayish brown, orbits vaguely more yellowed.

Pronotum brownish yellow, vaguely patterned with brown, especially the lateral ends and anterior border of scutum. Mesonotal praescutum obscure yellow with four reddish brown stripes that are vaguely bordered by pale brown, the central more darkened vitta represented only at anterior end, humeral border brown; scutal lobes cinnamon brown; posterior sclerites of notum dark brown, gray pruinose. Pleura yellowish gray, dorsopleural region light brown. Halteres light brown, knobs slightly darker. Legs with coxae pale grayish yellow; trochanters brownish yellow; remainder of legs brown, tarsi passing into black; claws of male toothed. Wings strongly tinged with brown, prearcular field and stigma slightly darker brown; a small more darkened cloud on R_{4-5} above *r-m;* veins brown. Veins behind *R* glabrous; R_3 and R_{4-5} with sparse microscopic setigerous punctures. Venation: Cell M_1 narrowly sessile; *m-cu* on M_{3-4} shortly before fork.

Abdominal tergites dark reddish brown, lateral borders of segments beyond the first narrowly margined by blackish, sternites slightly paler reddish brown; outer segments and hypopygium more darkened. Male hypopygium (Fig. 54) with tergite, *t,* narrowed posteriorly, apical border with two slender lobes that are separated by a narrow U-shaped emargination. Basistyle, *b,* at apex of mesal edge produced into a long flattened blade that is directed caudad, slightly expanded outwardly, apex gently emarginate, the blade about one-half the length of the style. Outer dististyle, *d,* flattened, pale, length about twice the greatest width; inner style appearing as a broad-based curved sclerotized

rod, apex shallowly bidentate, before tip with a small tubercle. Phallosome, *p,* including the stout gently curved aedeagus and slender sinuous rodlike gonapophyses, their tips acute.

Habitat: Colombia.

Holotype, ♂, Latitude 4° 10' North, Longitude 73° 10' West, January 20, 1959 (Juan Foerster). The locality apparently is in Meta, east of Puerto Lopez.

Ozodicera (*Dihexaclonus*) *telestyla* is readily told from other generally similar species by the hypopygial structure, where the elongate blade of the basistyle is quite different from that found in other species. Species having spines or spinous points at apex of basistyle include *O.* (*D.*) *macracantha, O.* (*O.*) *extensa, O.* (*O.*) *piatrix,* and *O.* (*O.*) *septemtrionis,* while *O.* (*O.*) *biaculeata* has two such spines.

Phacelodocera Enderlein

Phacelodocera Enderlein; Zool. Jahrb., Syst., 32: 26; 1912; (type *flabellifera* (Loew); original designation and monotypic).

Enderlein based this genus on the only known American species so far assigned to the group. Three other species are Australasian, including *Phacelodocera tasmaniensis* Alexander, of southeastern Australia, and two from New Caledonia, *P. herroni* Alexander and *P. margaritae* Alexander. It should be emphasized that the group is very close to the Australian *Ptilogyna* Westwood and may perhaps be treated as a subgenus or even fall into the synonymy.

List of Species

flabellifera (Loew), as *Ptilogyna* — Brazil.

References:

Loew, H., Beschreibung einiger neuen Tipularia terricola. — Linnaea Entomol., 5: 392-393, pl. 2, figs. 1-3, wing, antenna of male; 1851.

Alexander, C. P., New species of crane-flies from South America. Part XV. — Ann. Ent. Soc. America, 46: 600-602, pl. 1, fig. 2, antenna of female; 1953.

Loew's type, a male, was from Brazil, taken by Beske. It is uncertain whether the collector was C. F. C. Beske who collected insect materials in the vicinity of Rio de Janeiro prior to 1832, or his son, Carl Heinrich Beske, who made collections in Brazil in 1834-35. The only specimen that I have seen is a female taken at Campo Bello, Rio de Janeiro, March 16, 1946, by J. F. Zikán. As far as is known to me these are the only

specimens taken to date but there may be others in various collections. The wing of the allotype female is shown (Fig. 50). This differs from Loew's figures of the type male in the venation of the medial field, including the very long medial crossvein which is located at the fork of M_{3-4}. Whether this represents an abnormal condition or the character is a normal highly variable one remains in question.

The chief character that separates the fly from other Neotropical groups is the remarkably branched antenna of the male, in conjunction with hypopygial characters. Loew described the male as having 13-segmented antennae, with the first flagellar segment bearing a single very long branch, segments 2 to 8 inclusive each with three similar branches, arising close together near the base of the segment, with the outer three segments simple. The female antenna, as described and figured by the writer, has 14 segments, the first flagellar segment with a single branch, two to eight each with two long branches, outer four segments simple. It may be noted that the males of the two species from New Caledonia, above mentioned, have the largest and most consipcuously branched antennae, in relation to the size of the insect, of any known species of Diptera. In comparison with these the antennae of the type of *Ptilogyna, ramicornis* Walker, is relatively small and inconspicuous.

Tipula Linnaeus

Tipula Linnaeus; Systema Naturae, Ed. 10: 585; 1758; (type *oleracea* Linnaeus; designated by Latreille, 1810). It should be noted that recent studies by Dr. Bo Tjeder, of Lund, have shown that the species *oleracea,* as recognized by Linnaeus, has been mis-determined by later students and actually pertains to the species called *paludosa* by Meigen in 1830; the misnamed *oleracea* was designated as *Tipula submendosa* by Tjeder in 1941 (consult, Tjeder, Bo. The identity of *Tipula oleracea* L. Opuscula Entomologica, 18: 111-115, 3 maps; 1953).

I had earlier discussed the vast genus *Tipula* in a series of four reports published in the *Revista de Entomologia* between 1945 and 1951, as follows: Part I, vol. 16: 330-356, 9 figs.; 1945. — Subgenus *Microtipula.* Part II, vol. 16: 415-440, 25 figs.; 1945. — Subgenus *Microtipula.* Part III, vol. 17: 172-201, 7 figs.; 1946. — Subgenus *Eumicrotipula.* Part IV, vol. 22: 265-314, 24 figs.; 1951. — Subgenera *Bellardina, Trichotipula, Tipula,*

Yamatotipula, Oreomyza, and *Lunatipula.* In latter years certain important changes have been adopted in the latter group of subgenera, as follows: Subgenus *Tipula* now in *Yamatotipula; Oreomyza* in *Pterelachisus; Lunatipula* in *Triplicitipula,* as these names pertain to the local species and are so listed under the present account of the genus. *Neotipula* Alexander, formerly placed in *Tipula,* now is included in *Ischnotoma* Skuse and has been considered under that genus in this report. Recent comprehensive papers that discuss this re-organization within the genus *Tipula* include the following.

Alexander, C. P. New or little-known Tipulidae from Eastern Asia (Diptera), LIII. Philippine Jour. Sci., 93: 77-130, 52 figs.; 1964.
— The same, LVI. *Ibid.,* 94: 235-286, 50 figs.; 1965.
— New subgenera and species of crane-flies from California (Diptera: Tipulidae). Pacific Insects, 7: 333-386, 33 figs.; 1965.

Various other recent papers concerning the taxonomy and biology of the genus *Tipula* include the following.

Taxonomy of the adult flies

Alexander, C. P., The crane flies of California. Bull. California Insect Survey, 8: 1-269, 1 plate, 106 maps, 524 figs.; 1967.
Manheims, Bernhard, In Erwin Lindner, Die Fliegen der Palaearktischen Region, Lief. 170: 65-112, figs. 33-65, plate; 1952. Lief. 173: 113-136, figs. 66-83; 1953. Lief. 238: 137-176, figs. 84-127; 1963. Lief. 256: 177-212, figs. 128-172; 1965. Lief. 267: 213-256, figs. 173-219; 1966. Lief. 270: 257-288, figs. 220-255; 1967 (to be continued).
Savchenko, Eugen (Savtschenko), Fauna USSR, Diptera II, no. 3. Fam. Tipulidae, subfamily Tipulinae, Genus *Tipula* Linn. (part 1) 1-487, 295 figs.; 1961. The same, (part 2) 1-503, 382 figs.; 1964 (two further parts to appear).

Biology of the genus Tipula

Brindle, Allan, The larvae and pupae of the British Tipulinae (Diptera: Tipulidae). — Trans. Soc. British Ent., 14: 63-114, 179 figs.; 1960.
Chiswell, J. R., A taxonomic account of the last instar larvae of some British Tipulinae (Diptera: Tipulidae). — Trans. R. Ent. Soc. London, 108: 409-484, 110 figs.; 1956.
Theowald, Br. (Th. H. Van Leeuwen), Die Enwicklungsstadien der Tipuliden (Diptera, Nematocera), insbesondere der West-Palaearktischen Arten. — Tijd. v. Entomologie, 100: 1-XI, 195-308, 332 figs.; 1957.
— Bestimmungsbücher zur Bodenfauna Europas. Lief. 7. Familie Tipulidae (Diptera, Nematocera) Larven und Puppen, 1-100, 344 figs.; 1967.

The general structure of the adults and the immature stages have been treated in such detail in the references given that they need not be discussed further here.

List of Species

Subgenus *Bellardina* Edwards

Tipula (Bellardina) Edwards; Ann. Mag. Nat. Hist., (10) 8: 82; (type *craverii* Bellardi, as *cravieri;* original designation).

craverii Bellardi. — Mexico.
cydippe Alexander. — Guatemala, Venezuela.
edwardsi Bellardi. — Mexico.
larga Alexander. — Mexico.
obliquefasciata Macquart. — Colombia, Venezuela, Ecuador, Bolivia.
parrai Alexander. — Mexico.
schizomera Alexander. — Mexico; southwestern United States.
theobromina Edwards. — Venezuela, Ecuador, Peru, Bolivia.
wetmoreana Alexander. — Guatemala.

Subgenus *Eumicrotipula* Alexander

Microtipula (Eumicrotipula) Alexander; Bull. Mus. d'Hist. nat., Paris 1922: 74; 1922; (type *macrotrichiata* Alexander; original designation).

abortiva Alexander. — Peru.
absona Alexander. — Ecuador.
accipitrina Alexander. — Ecuador.
accumulatrix Alexander. — Guatemala.
aedon Alexander. — Venezuela.
aglossa Alexander. — Bolivia.
agrippina Alexander. — Ecuador.
albifasciata Macquart. — Chile.
amblythrix Alexander. — Peru.
amphion Alexander. — Chile.
andalgala Alexander. — Argentina.
andina Brèthes. — Argentina.
andromache Alexander. — Venezuela.
angolensis Alexander. — Chile.
antarctica Alexander. — Argentina, Chile.
anthonympha Alexander. — Argentina, Chile.
apterogyne Philippi. — Chile.
araguensis Alexander. — Venezuela.
araucania Alexander. — Chile.
arecuna Alexander. — Venezuela.
armillata Alexander. — Colombia.
asaroton Alexander. — Argentina.
asteria Alexander. — Peru.
atacama Alexander. — Bolivia.
atameles Alexander. — Peru.
atroscapa Alexander. — Brazil.
atrovelutina (Alexander), as *Microtipula.* — Paraguay.
auricomata Alexander. — Peru.
austroandina Alexander. — Argentina.
azteca Alexander. — Mexico.
bäckströmi Alexander. — Chile.
balloui Alexander. — Costa Rica.
barretoi Alexander. — Argentina.
bathromeces Alexander. — Bolivia.
bigotiana Alexander. — Chile.

bogotana Alexander. — Colombia.
brethesiana Alexander. — Argentina, Chile.
brevicoma Alexander. — Chile.
browniana Alexander. — Panama.
bruchi Alexander. — Argentina.
callisto Alexander. — Peru.
callithrix Alexander. — Peru.
campa Alexander. — Peru.
capucina Alexander. — Venezuela.
carizona Alexander. — Colombia, Ecuador, Peru.
Syn. — *sphaerulifera* Edwards. — Ecuador.
chacopata chacopata Alexander. — Venezuela.
c. chanca Alexander. — Peru.
chanchanensis sp. n. (Fig. 57, ♂ hypopygium). — Peru.
charmosyne Alexander. — Peru.
chicana Alexander. — Ecuador.
chilensis Alexander. — Chile.
chillanica Alexander. — Chile.
chilota Alexander. — Chile.
clarkiana Alexander. — Chile.
clavaria Alexander. — Peru.
consonata Alexander. — Ecuador.
conspicillata Alexander. — Bolivia, Peru.
coronaria Alexander. — Ecuador.
costaricensis (Alexander), as *Microtipula*. — Costa Rica.
crepera Alexander. — Chile.
cristata Alexander. — Venezuela.
crossospila Alexander. — Chile.
curinao Alexander. — Peru.
cyclomera Alexander. — Peru.
darlingtoniana Alexander. — Hispaniola: Dominican Republic.
delectata Alexander. — Ecuador.
diardis sp. n. (Fig. 59, venation). — Argentina.
dictyophora Alexander. — Bolivia.
dimorpha Alexander. — Argentina, Chile.
diodonta sp. n. (Fig. 58, ♂ hypopygium). — Chile.
duidae Alexander. — Venezuela.
duseni Alexander. — Chile.
efficax Alexander. — Ecuador.
emerita Alexander. — Ecuador.
enderleinana Alexander. — Argentina, Chile.
exilis Alexander. — Peru.
expleta Alexander. — Bolivia.
fatidica Alexander. — Ecuador.
fazi Alexander. — Chile.
flavidula Alexander. — Ecuador, Peru, Bolivia.
flavoannulata Jacobs. — Argentina.
foersteriana Alexander. — Colombia.
forsteri Alexander. — Bolivia.
fortior fortior Alexander. — Bolivia.
f. arepuchoensis Alexander. — Bolivia.
f. klausma Alexander. — Alexander.
fraudulenta Alexander. — Ecuador.
fuegiensis Alexander. — Chile.
glaphyroptera Philippi. — Chile.
glossophora Alexander. — Bolivia.

graphica Schiner. — «South America».
guarani Alexander. — Brazil.
hedymopa Alexander. — Ecuador.
hostifica Alexander. — Brazil.
huanca Alexander. — Peru.
hylonympha Alexander. — Chile.
iguazensis (Alexander), as *Microtipula*. — Argentina.
immerens Alexander. — Venezuela.
immorsa Alexander. — Peru.
inaequiarmata Alexander. — Bolivia.
inaequidens Alexander. — Ecuador.
inca Alexander. — Peru.
incondita Alexander. — Bolivia.
infidelis Alexander. — Peru.
infinita Alexander. — Venezuela.
innubens Alexander. — Peru.
invigilans Alexander. — Peru.
itatiayensis Alexander. — Brazil.
jacobsiana Alexander. — Argentina.
jaennickeana Alexander. — Chile.
jivaro Alexander. — Ecuador.
jubilans Alexander. — Ecuador.
juventa Alexander. — Ecuador.
kathema Alexander. — Peru.
kuehlhorni Alexander. — Bolivia.
kuscheli Alexander. — Chile.
lanigera lanigera Alexander. — Argentina.
l. tau Alexander. — Chile.
laterosetosa Alexander. — Colombia.
latifolia Alexander. — Chile.
legitima (Alexander), as *Microtipula*. — Paraguay.
ligulata Alexander. — Argentina, Chile.
ligulipenicillata Alexander. — Mexico.
longibasis Alexander. — Mexico.
longurioides Alexander. — Bolivia.
macintyreana Alexander. — Ecuador.
macrotrichiata (Alexander), as *Microtipula*. — Brazil.
magellanica Alexander. — Argentina, Chile.
Syn. — *magellanicola* Alexander. — Chile.
marmoripennis Rondani. — Venezuela.
martin-browni Alexander. — Ecuador.
mecoglossa Alexander. — Colombia.
mediodentata Alexander. — Peru.
meridiana Edwards. — Ecuador.
microspilota Alexander. — Chile.
miranha Alexander. — Colombia.
mithrodates Alexander. — Peru.
mitua Alexander. — Colombia.
mocoa Alexander. — Colombia.
moctezumae Alexander. — Mexico.
monilifera Loew. — Brazil.
moniliferoides Alexander. — Argentina, Brazil.
moniliformis Röder. — Colombia.
mordax Alexander. — Brazil.
morphaea Alexander. — Ecuador.
navarinoensis Alexander. — Chile.

neivai Alexander. — Venezuela.
nethis Alexander. — Peru.
nigriscapa Alexander. — Surinam.
nimbinervis Alexander. — Mexico.
nolens Alexander. — Ecuador.
nordenskjoldi Alexander. — Argentina, Chile.
nothofagetorum Alexander. — Argentina.
notoria Alexander. — Ecuador.
novaleonensis Alexander. — Mexico.
novatrix Alexander. — Peru.
nubifera van der Wulp. — Argentina.
obirata Alexander. — Ecuador.
obscuricincta Alexander. — Mexico.
odontomera Alexander. — Peru.
olssoniana Alexander. — Venezuela.
omnilutea Alexander. — Peru.
ona Alexander. — Chile.
oreonympha Alexander. — Argentina.
orizabensis Alexander. — Mexico.
ornaticornis van der Wulp. — Colombia.
osculata Alexander. — Ecuador.
palenca Alexander. — Venezuela.
palitans Alexander. — Peru.
pallidisignata pallidisignata Alexander. — Chile.
p. salutatoria Alexander. — Chile.
pallidineuris Macquart (*pallidinervis* of authors). — Colombia.
pantherina Alexander. — Venezuela.
paranensis Alexander. — Brazil.
parviloba Alexander. — Argentina, Chile.
patagonica Alexander. — Argentina, Chile.
pediformis Alexander. — Bolivia.
perjovialis Alexander. — Peru.
perstudiosa Alexander. — Brazil.
petalura Alexander. — Chile.
petaluroides sp. n. (Fig. 60, ♂ hypopygium). — Chile.
petiolaris Alexander. — Ecuador.
phalangioides Alexander. — Ecuador.
philippiana Alexander. — Argentina, Chile.
pictipennis Walker. — Chile.
pilulifera Edwards. — Ecuador.
pirioni Alexander. — Chile.
piro Alexander. — Peru.
platytergata Alexander. — Bolivia.
procericornis Edwards. — Ecuador.
profuga Alexander. — Brazil.
protrudens Alexander. — Argentina.
psittacina Alexander. — Argentina, Bolivia.
quadrisetosa Alexander. — Peru.
quichua Alexander. — Peru.
reciproca Alexander. — Mexico.
redunca Alexander. — Colombia.
reedi Alexander. — Chile.
resplendens Alexander. — Ecuador.
riveti riveti Edwards. — Ecuador.
r. tolimensis Alexander. — Colombia.
rucana Alexander. — Peru.

rufirostris Bigot. — Chile.
runtunensis Alexander. — Ecuador.
sariapampae Alexander. — Peru.
satrapa Alexander. — Chile.
schachovskoyi Alexander. — Argentina.
scriptella Alexander. — Panama.
semivulpina Alexander. — Peru.
serrilobata Alexander. — Chile.
serval Alexander. — Brazil.
songoana Alexander. — Bolivia.
spatulifera Alexander. — Chile.
spilota Wiedemann. — Brazil.
steinbachi Alexander. — Bolivia.
stenoglossa stenoglossa Alexander. — Peru.
s. propitia Alexander. — Peru.
suavissima Alexander. — Peru.
subandina Philippi. — Chile.
subcana Edwards. — Ecuador.
subglabrata Alexander. — Peru.
subligulata Alexander. — Chile.
tanymetra Alexander. — Bolivia.
tehuelche Alexander. — Argentina, Chile.
tephronota Alexander. — Peru.
tersa Alexander. — Chile.
tersoides Alexander. — Chile.
thalia Alexander. — Ecuador.
tovarensis Alexander. — Venezuela.
triemarginata Alexander. — Chile.
trispilota Alexander. — Peru.
tristillata Alexander. — Argentina, Chile.
tunguraguana Alexander. — Ecuador.
tyranna Alexander. — Mexico.
unistriata Alexander. — Peru.
ursula Alexander. — Peru.
valdiviana Philippi. — Chile.
varineura (Bigot), as *Nephrotoma;* (*variinervis* of authors). — Chile.
virgulata Williston. — Mexico.
Syn. — *oreomyzoides* Alexander. — Mexico.
votiva Alexander. — Bolivia.
willinki Alexander. — Argentina.
wittei Alexander. — Argentina.
woytkowskiana Alexander. — Peru.
yanamonteana Alexander. — Peru.
yungasensis Alexander. — Bolivia.
zeltale Alexander. — Mexico.
zeugmata Alexander. — Mexico.
zotzil Alexander. — Mexico.

Subgenus *Lunatipula* Edwards

Tipula (Lunatipula) Edwards; Ann. Mag. Nat. Hist., (10) 8: 81; 1931; (type *lunata* Linnaeus; original designation).

abscissa Alexander. — Mexico.
dampfiana Alexander. — Mexico.
lagunicola sp. n. (Fig. 61, ♂ hypopygium). — Mexico.
michoacana Alexander. — Mexico.

Subgenus *Microtipula* Alexander

Microtipula Alexander; Ann. Ent. Soc. America, 5: 360; 1912; (type *amazonica* Alexander; original designation).
Syn. — *Nephrotomodes* Alexander; Anal. Esc. Nac. Cien. Biologicas (Mexico D. F.), 4: 224; 1946, as *Tipula (Nephrotomodes;* (type *smilodon* Alexander, original designation).

aequitorialis Alexander. — Ecuador.
Syn. — *insolabilis* Alexander. — Peru.
affabilis Alexander. — Brazil.
akestra Alexander. — Peru.
alectro Alexander. — Peru. .
amara Alexander. — Peru.
amazonica (Alexander), as *Microtipula.* — Brazil, Surinam.
amoenicornis Alexander. — Argentina.
apollyon Alexander. — Bolivia.
appendens (Enderlein), as *Macromastix.* — Ecuador.
ariranhae Alexander. — Brazil, Paraguay.
armatipennis armatipennis Alexander. — Argentina, Brazil.
a. napoensis Alexander. — Peru.
austrovolens Alexander. — Bolivia.
aymara Alexander. — Bolivia.
bilimeki Alexander. — Mexico.
biprolata Alexander. — Brazil.
bitribula Alexander. — Peru.
blaseri Alexander. — Brazil.
brasiliensis (Wiedemann), as *Megistocera.* — Brazil.
bruesi Alexander. — Lesser Antilles: Grenada.
cerogama Alexander. — Ecuador.
cithariformis Alexander. — Ecuador.
colombicola Alexander. — Colombia.
contemplata Alexander. — Guatemala.
costaricensis (Alexander), as *Microtipula.* — Costa Rica.
crassistyla Alexander. — Peru.
ctenopyga Alexander. — Panama.
decens Alexander. — Peru.
decorata (Alexander), as *Habromastix.* — Brazil, Paraguay.
detecta Alexander. — Venezuela.
diacanthos Alexander. — Peru.
Syn. — *effera* Alexander. — Peru.
diadexia Alexander. — Peru.
didactyla Alexander. — Peru.
didolos Alexander. — Argentina.
dirhabdophora Alexander. — Panama.
discophora Alexander. — Peru.
efferox Alexander. — Brazil.
effeta Alexander. — Peru.
effulta Alexander. — Ecuador.
epione Alexander. — Bolivia.
erostrata Alexander. — Colombia.
eurymera eurymera Alexander. — Brazil.
e. goyazicola Alexander. — Brazil.
e. paraguayicola Alexander. — Paraguay.
falcifer Alexander. — Ecuador.
feliciana Alexander. — Brazil.
ferocia Alexander. — Brazil.

fiebrigi Alexander. — Paraguay.
flavopolita Alexander. — Brazil.
gladiator Alexander. — Brazil.
guato Alexander. — Brazil.
guerreroensis Alexander. — Mexico.
gutticellula Alexander. — Brazil.
heterodactyla Alexander. — Ecuador.
hexamelania Alexander. — Guatemala.
histrionica Alexander. — Costa Rica.
horribilis Alexander. — Bolivia.
icasta Alexander. — Ecuador.
impatiens Alexander. — Peru.
inaequilobata Alexander. — Ecuador.
inarmata Alexander. — Argentina.
infida Alexander. — Ecuador.
intemperata Alexander. — Ecuador.
jivaronis Alexander. — Ecuador.
jordanensis Alexander. — Brazil.
juquiella Alexander. — Brazil.
klagesi Alexander. — Brazil.
lagotis Alexander. — Brazil.
languidula Alexander. — Peru.
laticostata Alexander. — Brazil.
letalis Alexander. — Brazil.
lichyana Alexander. — Venezuela.
luctifica Alexander. — Ecuador.
luteilimbata Alexander. — Ecuador.
lyriformis Alexander. — Peru.
macrosterna (Alexander), as *Pachyrhina*. — Guatemala, Honduras.
mandator Alexander. — Costa Rica.
manniana Alexander. — Bolivia.
mediocompressa Alexander. — Ecuador, Peru.
megalyra Alexander. — Ecuador, Peru.
monocera Alexander. — Peru.
mulfordi Alexander. — Bolivia.
multimoda Alexander. — Colombia.
myriatricha Alexander. — Peru.
neolenta Alexander. — Ecuador.
Syn. — *lenta* Alexander.
nicoya Alexander. — Costa Rica.
nigroabdominalis (Alexander), as *Habromastix*. — Brazil.
nigrovariegata Alexander. — Ecuador.
niobe Alexander. — Venezuela.
opipara Alexander. — Bolivia.
ortoni Alexander. — Bolivia.
pala Alexander. — Brazil.
palaeogama Alexander. — Ecuador.
paloides Alexander. — Brazil.
paralenta Alexander. — Costa Rica.
pararia Alexander. — Peru.
parishi Alexander. — Brazil.
penana Alexander. — Bolivia.
perangustula Alexander. — Colombia, Venezuela.
percompressa Alexander. — Ecuador.
percomptaria Alexander. — Ecuador.
perdelecta Alexander. — Peru.

perlaticosta Alexander. — Brazil.
plaumanniana Alexander. — Brazil.
plumbeithorax Alexander. — Peru.
pontifex Alexander. — Peru.
porrecta Alexander. — Peru.
pretiosa Alexander. — Peru.
pritchardi pritchardi Alexander. — Mexico.
p. glabristyla Alexander. — Mexico.
proctotricha Alexander. — Ecuador.
prolixisterna Alexander. — Ecuador.
quadricollis Alexander. — Bolivia.
rectangulus Alexander. — Peru.
regressa Alexander. — Venezuela.
retrorsa Alexander. — Bolivia.
scaphula Alexander. — Panama.
scelesta Alexander. — Bolivia.
schildeana Alexander. — Costa Rica.
schwarzmaieri Alexander. — Brazil.
septemhastata Alexander. — Bolivia.
sexcincta Alexander. — Brazil.
smilodon Alexander. — Ecuador.
smithi Alexander. — Brazil.
sparsipila Alexander. — Bolivia.
spinicauda Alexander. — Panama.
sternohirsuta Alexander. — Ecuador.
subarmata Alexander. — Paraguay.
subaymara Alexander. — Bolivia.
subeffeta Alexander. — Peru.
subeffulta sp. n. (Fig. 63, ♂ hypopygium). — Peru.
subinfuscata Williston. — Lesser Antilles: St. Vincent.
subtecta Alexander. — Venezuela.
Syn. — *auricularis* Alexander. — Ecuador.
tancitaro Alexander. — Mexico.
temperata Alexander. — Mexico.
tenuicula Enderlein. — Colombia.
tenuilobata Alexander. — Ecuador, Peru.
terpischore Alexander. — Guatemala.
terribilis Alexander. — Ecuador.
tijucensis Alexander. — Brazil.
topoensis Alexander. — Ecuador, Peru.
trichoprocta Alexander. — Peru.
trihastata Alexander. — Peru.
trinidadensis (Alexander), as *Pachyrhina*. — Trinidad.
trinitatis Alexander. — Trinidad.
tucumanensis Alexander. — Argentina.
urophora Alexander. — Colombia, Ecuador.
virgilia Alexander. — Peru.
volens Alexander. — Peru.
zeteki Alexander. — Panama.
zonalis Alexander. — Venezuela.

Subgenus *Pectinotipula* Alexander

Pectinotipula Alexander; Jour. N. Y. Ent. Soc., 28: 9; 1920; (type *argentina* van der Wulp; original designation).

argentina (van der Wulp), as *Ozodicera.* — Argentina.
boliviensis (Alexander), as *Pectinotipula.* — Bolivia.
titicacae (Alexander), as *Pectinotipula.* — Bolivia, Peru.
tucumana (Alexander), as *Pectinotipula.* — Argentina.

Subgenus *Pterelachisus* Rondani

Pterelachisus Rondani; Rev. Zoolog. (Soc. Cuv.) 5: 243; 1842; (type *Bertei* Rondani; not *berteii* of authors; monotypic).

bellardiana Alexander. — Mexico.

Subgenus *Trichotipula* Alexander

Tipula (Trichotipula) Alexander; Proc. Acad. Nat. Sci. Philadelphia 1915: 468; 1915; (type *oropezoides* Johnson, Nearctic, original designation).

aplecta Alexander. — Mexico.
kraussi Alexander. — Mexico.
religiosa Alexander. — Mexico.
selanderi Alexander. — Mexico.
uxoria Alexander. — Mexico.
vultuosa Alexander. — Mexico.

Subgenus *Triplicitipula* Alexander

Tipula (Triplicitipula) Alexander; Pacific Insects, 7: 354; 1965; (type *triplex* Walker, Nearctic, original designation).

hoogstraali Alexander. — Mexico.

Subgenus *Yamatotipula* Matsumura

Yamatotipula Matsumura; Thousand Insects of Japan, Add. 2: 1916; (type *nova* Walker, as *Nohirae* Matsumura, Palaearctic, original designation).

jamaicensis Alexander. — Jamaica.
ludoviciana Alexander. — Southeastern United States; Cuba.
sayi Alexander. — Eastern United States; Bermuda.
subvirgo Alexander. — Mexico.
virgo Osten Sacken. — Mexico.

Tipula species, subgenus or genus uncertain

filigera Walker. — «South America».
quadrimaculata Bellardi. — Mexico.
seticornis Macquart. — Colombia.
tabida Enderlein. — Peru. Apparently a *Microtipula;* Vane-Wright suggests *Zelandotipula.*
trimaculata Macquart. — Chile.
trina Wiedemann. — Brazil.

Tipula (Acutipula) gaboonensis Alexander

Tipula gaboonensis Alexander; Bull. Mus. d'Hist. nat., Paris 1920: 403-405; 1920.
Tipula (Acutipula) Alexander; Arkiv för Zoologi, 16, no. 18: 11-12; 1924.
Tipula (Acutipula) gaboonensis Alexander; Philippine Jour. Sci., 57: 108; 1935.
Tipula (Acutipula) Savtschenko; Fauna U. S. S. Russia 79, Diptera II, 3: 360-427, figs. 214-262; 1961.

A male of this species was received, labelled Tela Progresso, Honduras, March 5, 1923, collected by T. H. Hubbell (University of Michigan). The specimen was included in a collection of Honduran crane flies taken by Hubbell and there is a question as to how this record is to be construed. Presumably it represents a mis-labelling of the specimen but the question of accidental introduction of the species into Tropical America cannot be overlooked. The present species is the type of the subgenus *Acutipula* Alexander, vastly developed in the Old World, including the Palaearctic, Oriental and Ethiopian regions, but with no representative known from the New World.

Tipula (Eumicrotipula) chanchanensis sp. n.

Allied to *subligulata;* mesonotal praescutum gray with four solidly dark brown stripes, pleura light gray, patterned with darker; antennae with outer end of scape and the pedicel yellow, flagellum black; femora light brown basally, outer half brownish black, enclosing a yellow subterminal ring, claws simple; wings marbled with cream yellow and brown, including four darker subcostal areas; male hypopygium with posterior border of tergite emarginate, outer end darker and nearly glabrous; posterior end of inner dististyle enlarged and rounded; eighth sternite with appendage a small flattened plate, apex shallowly emarginate, the rounded lobes with short setae.

M a l e. — Length, about 19 mm.; wing, 17 mm.; antenna, about 5.2 mm. Frontal prolongation of head relatively long, nearly equal to the remainder, light brownish gray above, clearer brown on sides; nasus elongate, tufted with long yellow setae; palpi brown, terminal segment brownish black. Antennae with scape light yellow, basal third pale brown, pedicel light yellow, flagellum black; flagellar segments with small basal enlargements, longest verticils a trifle less than the segments. Front pale brown, gray pruinose; posterior vertex gray, weakly patterned with light brown, including a diffuse central line and broader lateral areas, orbits narrowly gray.

Pronotal scutum brownish gray, anterior margin variegated with darker brown, scutellum yellowed. Mesonotal praescutum gray, with four solidy dark brown stripes, intermediate pair broader, virtually contiguous at cephalic border, lateral praescutal margins broadly darkened; scutum light gray, each lobe with two dark brown areas, the posterior one much larger; scutellum gray, with a brown central line, parascutella light brown; mediotergite with central third brown, sides paler brown, gray pruinose,

suture and posterior anapleurotergite brownish yellow, remainder of pleurotergite dark brown, the lower elevated part gray pruinose. Pleura light gray, conspicuously patterned with darker, including a brownish gray dorsal stripe extending from the propleura to the pleurotergite, ventral sternopleurite paler gray; dorsopleural membrane conspicuously light yellow. Halteres with stem light brown, base yellow, knob darker, apex restrictedly whitened. Legs with coxae light brown, gray pruinose; trochanters yellow; femora light brown, yellowed basally, outer half brownish black, with a conspicuous yellow subterminal ring that is subequal to the brownish black apex; tibiae and tarsi light brown, outer tarsal segments dark brown; claws small, simple. Wings with the restricted ground pale cream yellow, with an extensive pale brown pattern, with darker brown subcostal areas, including four in cell *Sc,* these more extensive than the ground interspaces; stigma slightly paler; the more extensive yellow ground areas include the prearcular field, bases of Anal cells, a transverse band across cells *R* and *M* beyond midlength, and a broad subbasal area in outer radial field, extending from veins *C* to M_{1-2}; veins brown, darker in the subcostal markings, yellow in the brightened costal interspaces. Venation: *Rs* nearly twice *m-cu;* petiole of cell M_1 about three times *m.*

Abdomen elongate; basal tergite brownish gray, succeeding tergites yellow, each with a sublateral dark brown stripe that is narrowly interrupted at posterior border, lateral margins more broadly yellow; sternites yellow; outer segments, including hypopygium, more extensively darkened. Male hypopygium (Fig. 57) with tergite, *t,* transverse, broadest at midlength, posterior border very shallowly emarginate, darkened and almost glabrous. Appendages of basistyle, *b,* including a larger setiferous lobe and a microscopic papillose arm, its tip truncate. Outer dististyle, *d,* moderately dilated on outer half, with long but relatively sparse setae; inner style long and narrow, apex of the slender lower beak obliquely truncated; dorsal crest with a row of about 30 strong yellow setae, those at ends of row smaller, the central group powerful; posterior end of style in region of the outer basal lobe enlarged and rounded, with relatively few setae. Gonapophysis blackened, shaped as figured, *g,* outer third narrowed. Eighth sternite, *8 s,* with appendage a small flattened dark-colored plate, its length about twice the breadth, apex with a shallow emargination to form paler rounded lobes with short setae.

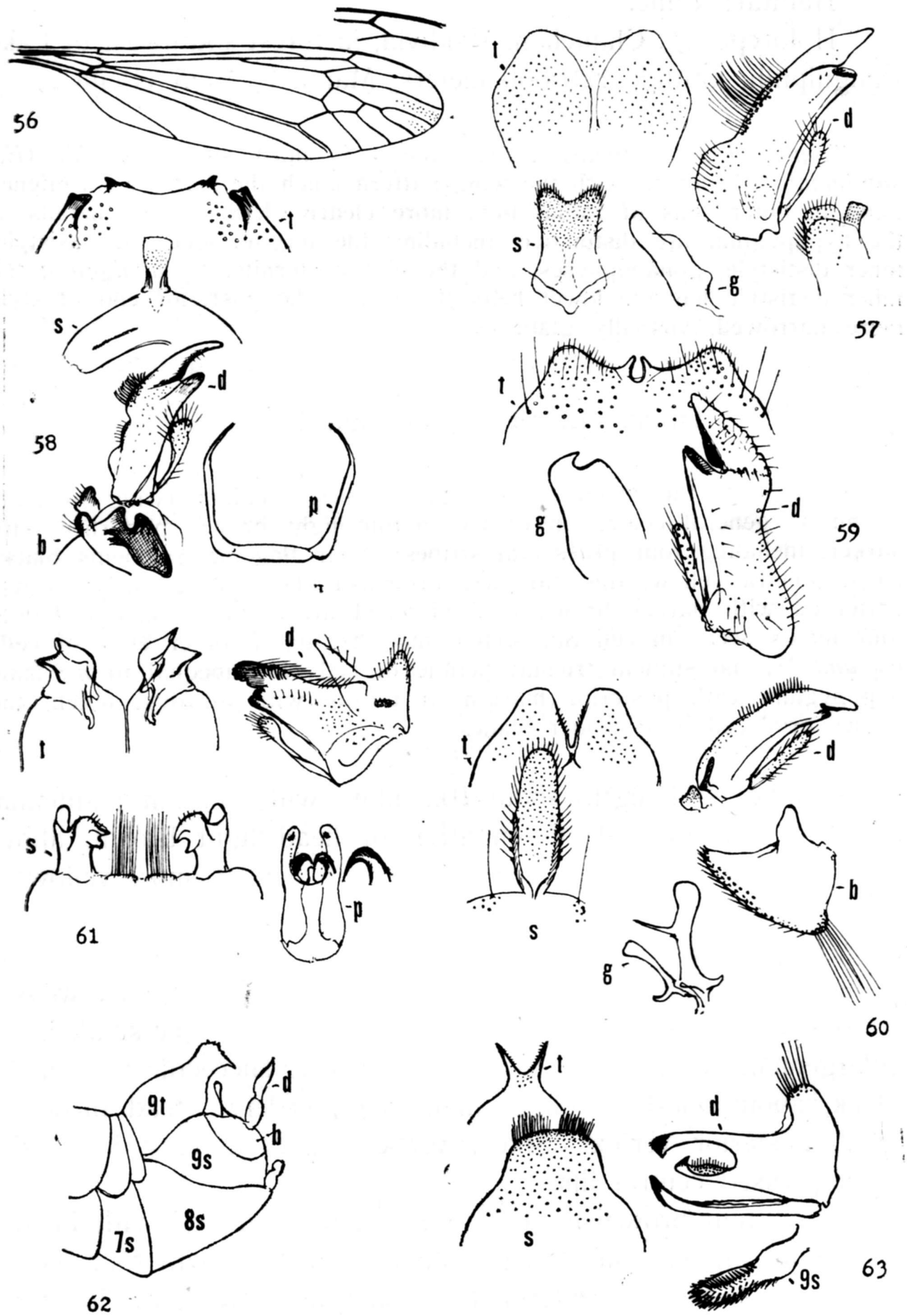

Fig. 56. *Tipula (Eumicrotipula) diardis* sp. n.; venation. — Fig. 57. *Tipula (Eumicrotipula) chanchanensis* sp. n.; male hypopygium. — Fig. 58. *Tipula (Eumicrotipula) diodonta* sp. n.; male hypopygium. — Fig. 59. *Tipula (Eumicrotipula) diardis* sp. n.; male hypopygium. — Fig. 60. *Tipula (Eumicrotipula) petaluroides* sp. n.; male hypopygium. — Figs. 61, 62. *Tipula (Lunatipula) lagunicola* sp. n.; male hypopygium. — Fig. 63. *Tipula (Microtipula) subeffulta* sp. n.; male hypopygium. — Symbols: *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *p*, phallosome; *s*, sternite; *t*, tergite.

Habitat: Chile.

Holotype, ♂, Chanchan, Valdivia, in forest southwest of Lake Panguipulli, altitude 120-600 meters, March 2, 1955 (Peña).

Tipula (*Eumicrotipula*) *chanchanensis* is most similar to *T.* (*E.*) *subligulata* Alexander, with the wing pattern much the same, the whitened band in outer cells of radial field more clearly defined. The details of the hypopygium are distinctive, including the tergite, lobes of basistyle, inner dististyle, gonapophyses, and the eighth sternite. In *subligulata* the inner dististyle has the lower beak broad and the posterior end of style more narrowed, virtually glabrous.

Tipula (Eumicrotipula) diardis sp. n.

Belongs to the *macrotrichiata* group; size medium (wing of male 11 mm.); general coloration of mesonotum light brown, patterned with darker, including four praescutal stripes; outer flagellar segments blackened; femora yellow, tips narrowly brownish black; wings light brown, patterned with darker brown and whitened areas, the former including four major areas in cell *Sc;* sparse macrotrichia in outer ends of cells R_5 *and* M_1, no stigmal trichia; petiole of cell M_1 subequal to *m;* male hypopygium with posterior margin of tergite with an oval notch, the angles produced into slender blades.

Male. — Length, about 10.5 mm.; wing, 11 mm.; antenna, about 4 mm. Frontal prolongation of head light brown, above with a narrow more darkened vitta; nasus slender, more yellowed, with long yellow setae; palpi brownish black. Antennae relatively long, slightly exceeding one-third the wings; scape obscure yellow, pedicel paler; first flagellar segment brownish yellow, base weakly darkened; segments two and three bicolored, the very small basal enlargements black, remainder light brown; succeeding segments black, about one-half longer than their verticils. Head brownish gray, posterior vertex darker; vertical tubercle very low, with an impressed central line.

Pronotum brownish gray, indistinctly patterned with brown. Mesonotal praescutum with ground light brown, with four darker stripes, including an intermediate pair that are gray in front, bordered by darker brown, including the central vitta, the stripes strongly narrowed behind at the suture, lateral stripes narrow, dark brown; scutal lobes chiefly dark brown, central area brownish yellow, immediately behind suture with two parallel darkened lines; posterior sclerites of notum light brown, mediotergite with indications of a darker central line. Pleura and pleurotergite chiefly yellowed, indistinctly patterned with very pale brown, especially on the anapleurotergite, dorsal pteropleurite, anepisternum and

ventral sternopleurite; mesonotal vestiture short and sparse, most evident on the mediotergite and praescutal interspaces. Halteres with stem pale yellow, knob infuscated. Legs with coxae brownish yellow, trochanters clearer yellow; femora yellow, tips narrowly brownish black; tibiae brownish yellow, tips similarly infuscated; tarsi brownish yellow, outwardly passing into dark brown; claws simple. Wings (Fig. 56) chiefly light brown, patterned with darker brown and pale areas; a series of four large darker brown marks in cell *Sc,* restricting the deeper yellow interspaces; stigma paler brown; on disk the restricted whitened areas include an oblique band before cord, extending from cell R_1 to vein *Cu;* a broad post-stigmal band and a comparable area across cell *1st A* along the vein, including the subterminal part of cell *Cu;* a darkened seam along vein *Cu,* more intense between the branches; veins brown, more yellowed in the brightened areas. Macrotrichia on outer third of cells R_5 and M_1, in figure their position indicated by stippling; most longitudinal veins beyond general level of origin of *Rs* with trichia, lacking on basal section of M_3; trichia of vein *1st A* chiefly at outer end, of *2nd A* scattered over outer half; a few trichia on prearcular section of *1st A.* Venation: R_{1-2} atrophied; *Rs* long, nearly straight, about twice *m-cu; r-m* short; petiole of cell M_1 subequal to *m; m-cu* shortly before fork of M_{3-4}.

Basal abdominal segments obscure yellow, lateral tergal borders blackened, outer segments darker, including central parts of tergites and more than outer half of sternites; hypopygium light brown. Male hypopygium (Fig. 59) with tergite, *t,* transverse, posterior border broadly emarginate, with a further small oval median notch, the adjoining angles produced into slender glabrous blades. Outer dististyle, *d,* small, nearly cylindrical; inner style with apex of lower beak and lower margin of beak blackened; outer crest weakly corrugated; all setae delicate and inconspicuous. Gonapophysis, *g,* with outer blade terminating in a small point, separated by a U-shaped notch.

Habitat: Argentina.

Holotype, ♂, Parque Aconquija, Tucumán, altitude 800 meters, January 11, 1953 (Pedro W. Wygodzinsky).

The most similar species is *Tipula* (*Eumicrotipula*) *legitima* (Alexander), of Paraguay, which lacks macrotrichia in the wing cells and has the leg pattern quite distinct. The structure of the hypopygium of *legitima* has not been described and is unknown to me. In the present fly the tergal spines that have suggested the specific name are particularly noteworthy.

Tipula (Eumicrotipula) diodonta sp. n.

Size large (wing over 17 mm.); general coloration of thoracic notum gray, patterned with brown; antennae relatively long, scape and pedicel yellow, flagellum black; legs brownish yellow to light brown; wings cream-yellow, with an extensive marbled light brown pattern, with a series of four darker brown subcostal areas that are extended backward across cells *R* and *M;* basal abdominal segments yellow, tergites with narrow sublateral lines, outer segments more uniformly darkened; male hypopygium with posterior border of tergite with two acute inner teeth and broader more lateral lobes; outer dististyle terminating in a broadened spatula, inner style narrow, posterior border near base with a rounded knob, beak slender; eighth sternite unusually narrow, appendage simple, about two and one-half times as long as broad, apex truncate.

Male. — Length, about 17.5 mm.; wing, 17.5 mm.; antenna, about 5 mm.

Female. — Length, about 19 mm.; wing, 18 mm.

Frontal prolongation of head above brownish yellow, sparsely pruinose, clearer yellow below, nasus conspicuous; palpi brownish black. Antennae of male relatively long; scape and pedicel yellow, flagellum black; flagellar segments longer than their verticils. Head light gray, vertex with a narrow brown central vitta, sides of genae slightly infuscated.

Pronotum light brownish gray. Mesonotum gray, praescutum with four stripes, the narrow intermediate pair light brown, much narrower than the central gray area, lateral stripes broader, dark brown, humeral and lateral borders dark brown; scutum gray, each lobe with two separated dark brown areas; scutellum light brown, heavily light gray pruinose, with a central brown darkening. Pleura reddish brown, variegated with darker brown, especially on anepisternum; dorsopleural membrane obscure yellow. Halteres with stem pale brown, base narrowly yellow, knob dark brown, apex yellowed. Legs with coxae brownish yellow, sparsely pruinose; trochanters yellow, lower face at apex with a brown spot; femora brownish yellow, tips darker brown, preceded by a subequal clear yellow ring; tibiae and tarsi light brown, tip of former narrowly darker. Wings of male cream yellow, heavily patterned and marbled with light brown, the dark coloration much exceeding the yellow ground; a series of four darker brown areas in cell *Sc,* the basal one including also costa at *h* and the bases of cells *R* and *M;* remaining subcostal areas not involving cell *C* but continued posteriorly across cells *R* and *M,* greatly restricting the yellow ground at midlength of cells; remainder of the ground patterned with interrupted spots in

virtually all cells, including a marginal series in all cells, most extensive in cell R_5, very reduced in M_1 and *2nd* M_2, darkened area in cells *Cu* and *1st A* more zigzag; in the female, ground areas broader, especially the band at near midlength of cells *R* and *M* which continue virtually uninterrupted in cells *Cu* and *1st A*, outer band in cells R_2 to R_5 broad; veins brown, interspaces of *C, Sc, R* and *Cu* yellowed. Venation: *Rs* long, more than twice R_{2-3}; petiole of cell M_1 about one-half longer than *m*.

Abdominal tergites yellow, basal segments with a narrow broken brown sublateral line, becoming obsolete at about segment five; sternites light yellow, in female posterior borders of outer segments narrowly darkened; outer segments, including hypopygium, darker brown, restrictedly patterned with yellow. Ovipositor with cerci slender, straight. Male hypopygium (Fig. 58) with tergite, *t*, broad, scooplike, narrowed outwardly; posterior margin with four points, the outer pair larger, obtuse, the small inner pair appearing as acute points. Basistyle, *b*, with sclerotized armature at apex, including a flattened blade shaped like an arrowhead, as figured. Outer dististyle, *d*, dilated on outer third; inner style narrow, posterior border near base with a rounded glabrous knob; beak slender, before base on margin with a row of yellow setae. Phallosome apparently including slender simple spines; aedeagus relatively long, black. Eighth sternite, *8s*, with body unusually narrow, strongly arcuated, the impressed lines shortly behind midlength; a simple median appendage, about two and one-half times as long as the breadth across the truncated apex, outer half with abundant small setae and dense microscopic setulae.

Habitat: Chile.

Holotype, ♂, Butamalal, Nahuelbuta, Arauco, altitude 1,400-1,600 meters, February 12-20, 1953 (L. E. Peña). Allotopotype, ♀, February 25, 1953 (L. E. Peña).

The most similar regional species are *Tipula* (*Eumicrotipula*) *bigotana* Alexander and *T.* (*E.*) *magellanica* Alexander, which similarly have marbled wings and a simple appendage on the eighth sternite of the male hypopygium. These, and other species, differ in hypopygial structure, particularly the tergite, basistyle and dististyles.

Tipula (Eumicrotipula) petaluroides sp. n.

Allied and similar to *petalura;* wings with darkened areas less extensive, including those in cell *R;* a complete whitened crossband beyond cord; male hypopygium with gonapophyses and appendage of eighth sternite distinctive.

Male. — Length, about 17 mm.; wing, 15 mm.; antenna, about 4.4 mm.

Female. — Length, about 20 mm.; wing, 15-17 mm.; antenna, about 2.5-2.9 mm.

Frontal prolongation of head relatively long, subequal to remainder, castaneous above, darker below, nasus conspicuous, brown; palpi brownish black. Antennae brownish black, apex of pedicel obscure yellow; flagellar segments feebly incised, the intermediate ones subequal to their longest verticils. Head chiefly infuscated, orbits gray, posterior vertex with a capillary darker central line; vertical tubercle low, rounded.

Pronotum gray, patterned with brown. Mesonotal praescutum gray with four narrow brownish black stripes, the long intermediate pair separated by a narrower ground line, the ends more approximated; scutum light gray, lobes slightly darker; scutellum and mediotergite gray, with a poorly indicated darker central line, parascutella brown. Pleura and pleurotergite gray, vaguely patterned with darker, more evident on ventral anepisternum, sternopleurite and meron; dorsopleural membrane conspicuously buffy yellow. Halteres with stem yellowed, knob infuscated, paling to brownish yellow. Legs with coxae gray; trochanters obscure yellow, inner faces darkened; femora obscure yellow, tip narrowly brownish black, preceded by a slightly clearer yellow area; tibiae and basitarsi brownish yellow, tips vaguely darkened, remainder of tarsi dark brown; claws of male with basal tooth. Wings with ground whitened, with a conspicuous more extensive brown pattern; prearcular area and interspaces of costal field light yellow; four costal darkenings, all reaching vein *C*, the first at arculus, attaining *Cu* behind; second and third areas larger, reaching vein *M;* fourth darkening including stigma and a large cloud over anterior cord and outer end of cell *R;* wing tip broadly darkened, with barely indicated brightenings in outer ends of cells R_5 and *2nd* M_2, cell M_4 and outer half of *M* uniformly lighter brown; further pale brown darkenings in cell *Cu* except at end and extensively in outer ends of both Anal cells; the pale ground areas include three in cell *R* and a complete band beyond cord, crossing wing from *C* into cell M_3; veins light brown, more yellowed in the ground areas. Venation: *Rs* long, about two and one-half times *m-cu;* R_{1-2} strongly elevated; petiole of cell M_1 nearly twice *m; m-cu* on M_4, the basal section of the latter long, transverse.

Abdomen with basal tergite dark brown, second chiefly yellow, succeeding tergites infuscated, the lateral margins broadly pale, internally with a darkened line; basal sternite yellowed, the remainder darkened; outer segments more uniformly dark brown, the appendages of hypopygium more yellowed. Male hypopygium (Fig. 60) generally as in *petalura,* differing in certain important details, especially of the basistyle, gonapophyses, and appendage of the eighth sternite. Ninth tergite, *t,* with posterior emargination deep and narrow, lateral lobes longer and narrower than in *petalura.* Basistyle with dorsal margin of lobe produced into a flattened glabrous blade. Gonapophysis, *g,* with both arms distinctive, the larger one long and narrow, inner arm outwardly expanded, terminating in a truncated head. Eighth sternite, *8s,* with appendage pale, nearly parallel-sided, narrower than in *petalura.*

Habitat: Chile.

Holotype, ♂, Pichinahuel, Nahuelbuta, Arauco, altitude 1,400-1,600 meters, February 12-20, 1953 (L. E. Peña). Allotype, ♀, Neltume, Valdivia, altitude 480 meters, March 3, 1955 (L. E. Peña). Paratype, ♀, Puerto Fui, Valdivia, altitude 600-800 meters, March 4, 1955 (L. E. Peña).

Although it is very similar to *Tipula* (*Eumicrotipula*) *petalura* Alexander, from Chilöe Island, Chile, the present fly is distinctive in hypopygial structure, especially the gonapophyses and appendage of the eighth sternite. The hypopygium of *petalura* was discussed and figured in the original description (Agr. Tec. Chile, 13, No. 1: 8-9, figs. 1-2; 1953).

Tipula (Lunatipula) lagunicola sp. n.

Belongs to the *tergata* group; mesonotal praescutum grayish yellow, with four poorly indicated narrow brown stripes; antennae relatively long, scape and pedicel light yellow, flagellum black; wings strongly yellowed, stigma pale brown; abdominal tergites reddish yellow with three blackened stripes; male hypopygium large, outer lateral angles of tergite broad and flattened, virtually bidentate; inner dististyle with both beak and lower beak heavily blackened, outer basal lobe large, unequally bilobed; eighth sternite with lateral angles bearing large irregular darkened lobes, without setae, median area with two brushes of long reddish yellow setae.

Male. — Length, about 14.5-15 mm.; wing, 17-18.5 mm.; antenna, about 5.3-5.5 mm. Frontal prolongation of head yellow, relatively long, only a little shorter than the remainder, nasus distinct; palpi obscure yellow, terminal segment brown. Antennae

relatively long; scape and pedicel light yellow, flagellum black; flagellar segments with basal enlargements distinct, longest verticils subequal to or slightly exceeding the segments. Head light grayish brown, sides of vertex clearer gray; vertical tubercle low and inconspicuous.

Pronotum brownish yellow. Mesonotal praescutum grayish yellow with four poorly indicated narrow brown stripes, the intermediate pair separated by a broader more grayish central line, posterior sclerites of notum brownish gray. Pleura brownish yellow, sparsely pruinose, more distinct in the holotype. Halteres with stem obscure yellow, brighter at base, knob dark brown. Legs with coxae brownish gray; trochanters yellow; femora and tibiae light brown, outer tarsal segments darker; claws of male toothed. Wings strongly yellowed, costal region slightly more brownish yellow; stigma pale brown; veins slightly darker brown. Macrotrichia on outer radial veins, sparser on medial branches, with relatively few on outer end of *M; Cu_1* with relatively numerous trichia, including also a few on posterior end of *m-cu;* vein *2nd A* with numerous trichia over most of the length. Venation: Petiole of cell M_1 and *m* subequal.

Abdominal tergites reddish yellow with three blackened stripes, lateral pair beginning at posterior end of second segment, widened behind through segment five; sternites and outer segments more uniformly reddish brown, outer segments sparsely pruinose; in the holotype sternites three and four more blackened, evidently caused by discoloration; ninth tergite darker brown. Male hypopygium (Figs. 61, 62) large, as in the *tergata* group. Ninth tergite, *t,* with outer lateral angles broad, appearing as flattened virtually bidentate blades, the irregular margins narrowly blackened, central emargination extensive. Outer dististyle, *d,* slender, apical dilation very small; inner style with both beak and lower beak heavily blackened, especially the former; outer basal lobe large, pale brown, unequally bilobed, outer lobule smaller and more obtuse. Phallosome including two pairs of unequal gonapophyses, the shorter lower pair narrowed and strongly curved outwardly, tips acute. Eighth sternite, *8s,* with lateral angles bearing large darkened irregular lobes without setae, median area with two brushes of long reddish yellow setae. — *Habitat:* Mexico.

Holotype, ♂, La Laguna, Sierra Laguna, Baja California, October 14, 1941 (E. S. Ross & G. E. Bohart); California Academy of Sciences. Paratopotype, ♂, in Alexander Collection.

Related species in the *tergata* group occurring in the Southwestern United States include *Tipula* (*Lunatipula*) *flavocauda* Doane, *T.* (*L.*) *kirkwoodiana* Alexander, *T.* (*L.*) *mesotergata* Alexander, *T.* (*L.*) *mohavensis* Alexander, *T.* (*L.*) *raysmithi* Alexander, *T.* (*L.*) *sternata* Doane, and *T.* (*L.*) *tergata* Doane. All of these have been discussed, keyed and figured in the author's recent *Crane flies of California* (Bull. California Insect Survey, 8: 1-269, 1 plate, 106 maps, 524 figs.; November 1967; reference on page 33; Berkeley, California). The male hypopygium of the present fly is distinct from those of all of the above named species.

Tipula (Microtipula) subeffulta sp. n.

Allied to *effulta;* flagellar segments more uniformly blackened; praescutum orange, the intermediate stripes clearer orange; male hypopygium with tergal blades narrow, blackened; lower arm of inner dististyle with a strong recurved blackened point.

Male. — Length, about 14-15 mm.; wing, 13-13.5 mm.; antenna, about 4.4-4.5 mm. Frontal prolongation of head yellow, nasus relatively short; palpi brownish yellow, the long terminal segment clearer yellow. Antennae with proximal three segments yellow, succeeding two or three bicolored, black, the narrow tips yellowed, outer segments uniformly black. Head buffy orange.

Thoracic dorsum almost uniformly orange, intermediate praescutal stripes faintly differentiated, clearer orange. Pleura yellow. Halteres with stem light brown, knob brownish black. Legs with coxae and trochanters yellow; femora brown, more yellowed basally; tibiae brown, tarsi passing into black; claws of male toothed. Wings faintly tinged with brown, cells *C* and *Sc* dark brown, prearcular field and stigma slightly paler brown, wing tip, especially in outer radial field, still paler brown; narrow inconspicuous brown seams over cord and outer enf of cell *1st* M_2; veins brown.

Abdomen orange, lateral borders of the more proximal segments narrowly darkened; a conspicuous black subterminal ring, including segments six to eight; hypopygium paler brown, dististyles yellow. Male hypopygium (Fig. 63) generally as in *effulta,* differing in details. Tergal blades, *t,* narrow, blackened, especially along mesal margins which are fringed with short setae. Dististyles, *d,* slightly different, the lower arm of inner style with a strong slightly recurved blackened point.

Habitat: Peru.

Holotype, ♂, Divisoria, Cordillera Azul, Huanuco, altitude 1,600 meters, August 18, 1947 (J. M. Schunke). Paratopotype,

♂, altitude 1,800 meters, July 31, 1947. Paratype, ♂, Fundo Sinchono, Huanuco, altitude 1,500 meters, August 10, 1947 (J. M. Schunke).

Although the present fly is closely related to *Tipula (Microtipula) effulta* Alexander, of Ecuador, I consider the two flies to be distinct in the characters listed in the diagnosis.

Valdiviana Alexander

Valdiviana Alexander; Diptera Patagonia and South Chile, 1: 17, figs. 1, 2 (wing), fig. 112 (♂ antenna), fig. 113 (♂ hypopygium); 1929; (type *edwardsina* Alexander; original designation).

Valdiviana includes only the species listed below. The nearest relatives appear to be the genera *Elnoretta* Alexander and *Acracantha* Skuse. Antennae of male with scape very long, subequal to the succeeding four or five segments combined; proximal six or seven flagellar segments with lower face strongly produced, rounded, without verticils, upper surface with numerous short setae; outer flagellar segments cylindrical, simple, with long verticils that exceed the segments. Wings (Fig. 64) with cell M_1 broadly sessile. Male hypopygium with the basistyle produced at apex into a strong spine. Dististyles complicated in structure.

List of Species

edwardsina Alexander. — Argentina.
neuquenensis Alexander. — Argentina, Chile.
shannonina Alexander. — Chile.
synempora Alexander. — Argentina.

Zelandotipula Alexander

Holorusia (Zelandotipula) Alexander; Ann. Mag. Nat. Hist., (9) 9: 522-523; 1922; (type *Novarae* Schiner, as *Tipula;* original designation).
Zelandotipula Vane-Wright; Jour. nat. Hist., 1: 542-545, figs., map; 1967.

The genus *Zelandotipula* was described as a subgenus of *Holorusia* Loew, being based on a few species from New Zealand. In the recent significant paper by Vane-Wright, discussed earlier under *Holorusia* and *Ischnotoma,* numerous Neotropical species that had been referred by the present writer to the genus *Holorusia* were transferred to *Zelandotipula* and this arrangement is adopted here. The various species strongly suggest *Holorusia* in antennal structure and in venation but differ in important features of the male hypopygium.

For a summary of characters the Vane-Wright paper should be consulted. The structure of the male hypopygium, particularly

of the inner dististyle with its armature of blackened peglike spinoid setae, is of special significance in the genus, particularly in the number and distribution of these setae.

In the Neotropical region species occur as far north as southern Mexico, thence southward to Paraguay and northern Argentina. A species that was described as *microcephala* van der Wulp (name preoccupied, see *parviceps* Speiser, in list) from Guadeloupe island in the Lesser Antilles remains unrecognized. It seems certain that this locality as given is erroneous since no member of the genus is known from the West Indies and the species scarcely appears to be regional. Nothing is known concerning the biology of the Neotropical species but the pupa of *Zelandotipula novarae,* in New Zealand, was mentioned briefly by Vane-Wright.

List of Species

acutistyla (Alexander), as *Holorusia* — Ecuador.
associans (Walker), as *Tipula* — Mexico, Guatemala.
Syn. *guatemalensis* (Alexander), as *Holorusia* — Guatemala.
austrofurcifera sp. n. — Colombia.
bisatra (Alexander), as *Holorusia* — Bolivia.
calvicornis (Edwards), as *Prionocera* — Ecuador.
calypso (Alexander), as *Holorusia* — Ecuador.
catamarcensis (Alexander), as *Holorusia* — Argentina.
celestissima (Alexander), as *Holorusia* — Peru.
chimborazo (Alexander), as *Holorusia* — Ecuador.
corynostyla sp. n. — Colombia.
cristalta (Alexander), as *Holorusia* — Bolivia.
cristifera (Alexander), as *Holorusia* — Ecuador.
cristobtusa (Alexander), as *Holorusia* — Bolivia.
diducta sp. n. — Ecuador.
(*eluta* Schiner, see *schineri* Alexander)
fassliana (Alexander), as *Holorusia* — Bolivia.
flavicornis (Alexander), as *Holorusia* — Venezuela.
flavogenualis (Alexander), as *Holorusia* — Peru.
forsteriana (Alexander), as *Holorusia* — Bolivia.
furcifera (Alexander), as *Holorusia* — Costa Rica.
gracilipes (Walker), as *Tipula* — Brazil.
hornii (Alexander), as *Holorusia* — Brazil.
infernalis (Alexander), as *Holorusia* — Venezuela.
juturna (Alexander), as *Holorusia* — Paraguay, Peru.
laevis (Alexander), as *Holorusia* — Brazil, Paraguay.
lassula (Alexander), as *Holorusia* — Ecuador.
longitarsis (Macquart), as *Tipula* — Colombia, Venezuela.
luteivena (Alexander), as *Holorusia* — Bolivia.
(*microcephala* van der Wulp, see *parviceps* Speiser)
monostictula (Alexander), as *Holorusia* — Ecuador, Peru.
neurotrichia (Alexander), as *Holorusia* — Bolivia.
nigrosetosa (Alexander), as *Holorusia* — Peru.
orophila (Alexander), as *Holorusia* — Colombia.

parviceps (Speiser), as *Tipula* — Lesser Antilles: Guadeloupe.
Syn. *microcephala* (van der Wulp, 1881) as *Tipula,* preoccupied by *microcephala* (Bigot, 1858); *vanderwulpi* (Alexander, 1912) as *Tipula.*
parvimacula (Alexander), as *Holorusia* — Brazil.
perobtusa sp. n. — Peru.
perstrangalia (Alexander), as *Holorusia* — Bolivia.
peruviana (Alexander), as *Holorusia* — Peru.
plagifera (Alexander), as *Holorusia* — Venezuela.
retrorsa sp. n. — Colombia.
ringens (Alexander), as *Holorusia* — Brazil, Paraguay.
schineri (Alexander), as *Holorusia,* 1934 — British Guiana, Brazil.
Syn. *eluta* Schiner, as *Tipula,* 1868, preoccupied by *eluta* Loew, as *Tipula,* 1863).
sinuosa (Alexander), as *Holorusia* — Peru.
songoensis (Alexander), as *Holorusia* — Bolivia.
strangalia (Alexander), as *Holorusia* (Fig. 65, venation) — Venezuela.
subfurcifera (Alexander), as *Holorusia* — Honduras.
sublaevis (Alexander), as *Holorusia* — Brazil.
subtarda (Alexander), as *Holorusia* — Paraguay.
tarda (Alexander), as *Holorusia* — Brazil, Paraguay.
triatra (Alexander), as *Holorusia* — Bolivia.
trichoneura (Alexander), as *Holorusia* — Bolivia.
tuberculifera (Alexander), as *Holorusia* — Peru.
uniatra (Alexander), as *Holorusia* — Peru.
vivida (Alexander), as *Holorusia* — Ecuador.
vulpes (Alexander), as *Holorusia* — Brazil.
yungasicola (Alexander), as *Holorusia* — Bolivia.
zamorae (Alexander), as *Holorusia* — Ecuador.

Zelandotipula austrofurcifera sp. n.

Allied to *furcifera;* mesonotal praescutum brown, intermediate stripes more yellowed; antennal flagellum bicolored; wings conspicuously patterned with brown, including a postarcular darkening and a major spot at midlength of cell *M;* male hypopygium with posterior margin of tergite trilobed, vestiture of lateral lobes relatively sparse; branch of outer dististyle glabrous, tip obtuse; spicules of disk of inner style relatively few in number.

Male. — Length, about 15 mm.; wing, 16 mm.; antenna, about 3.8 mm. Frontal prolongation of head about two-thirds the remainder, dorsal half obscure yellow, ventral half dark brown, nasus elongate; palpi with basal three segments dark brown, terminal segment obscure yellow. Antennae with proximal three segments obscure yellow, succeeding segments bicolored, basal and ventral surfaces brown, tips yellowed, the amount of the latter decreasing on outer segments, outer three uniformly darkened; terminal segment nearly one-half as long as the penultimate, slender. Head light brown; anterior vertex nearly four times the diameter of the scape.

Pronotum brown. Mesonotal praescutum chiefly brown, including the usual lateral stripes, intermediate stripes more yellowed, the capillary median vitta gray; scutal lobes brown, scutellum and mediotergite more brownish yellow; pleurotergite weakly darkened dorsally, katapleurotergite light yellow. Pleura light yellow. Halteres infuscated. Legs with all coxae and trochanters clear light yellow; femora and tibiae brownish yellow, tips blackened, those of the latter narrower; tarsi brown, claws of male simple. Wings with the ground light brown, conspicuously patterned with darker brown and cream colored areas; the dark pattern includes the prearcular field, cells *C* and *Sc,* stigma, an extensive post-arcular area in cells *R* and *M,* a large spot at midlength of cell *M,* and seams at origin of *Rs;* further darkenings include the fork of *M, m-cu* and beyond the cord in bases of cells R_3 and R_5; the chief cream colored areas are at outer end of cell *R* and before and beyond the darkened spot in cell *M;* veins brown, obliterative areas conspicuous. Veins behind *R* essentially glabrous, with very sparse weak trichia on R_{4-5} and petiole of cell M_1. Venation: Distal section of R_{4-5} strongly sinuous, narrowing cell R_3; petiole of cell M_1 nearly twice *m; m-cu* beyond midlength of M_{3-4}.

Abdominal tergites medium brown, basal ring of second segment more yellowed, sternites yellow; subterminal segments dark brown to form a narrow ring; hypopygium yellowed. Male hypopygium (Fig. 66) with the tergite, *t,* trilobed, the central projection conspicuous, lateral lobes longer with relatively sparse vestiture. Outer dististyle, *d,* elongate, relatively slender, setiferous, the conspicuous branch at midlength of inner face glabrous, tip obtuse; inner style with blackened spinoid setae of disk much fewer than in either *furcifera* or *subfurcifera.*

Habitat: Colombia.

Holotype, ♂, Monteredondo, Cundinamarca, altitude 1,420 meters, January 5, 1959 (Juan Foerster).

Other species that have the outer dististyle of the male hypopygium furcate include *Zelandotipula furcifera* (Alexander) and *Z. subfurcifera* (Alexander), both differing from the fly in hypopygial structure, as discussed.

Zelandotipula corynostyla sp. n.

Mesonotal praescutum light brown with four more cinnamon brown stripes that are narrowly margined with darker brown; posterior sclerites of notum and the pleura yellow; wings light brown, prearcular and

costal fields darker, a small brown spot in cell *M;* abdomen reddish brown, subterminal segments black; male hypopygium with posterior face of each tergal lobe long-oval, with abundant blackened spinoid setae; inner dististyle with outer plate broadly subtriangular, densely set with small blackened spinoid setae.

Male. — Length, about 16-17 mm.; wing, 16-17 mm.; antenna, about 3.5-3.7 mm. Frontal prolongation of head yellowish brown, nasus concolorous, long and slender; palpi black, terminal segment brownish yellow. Antennae relatively short; scape elongate, brownish yellow, pedicel and first flagellar segment light yellow, flagellar segments two to eight bicolored, brown basally and along lower face, outer end yellowed, outer three segments brownish black; flagellar segments relatively short, the intermediate ones about twice as long as broad, terminal segment slender, about one-third the penultimate. Head brown, very vaguely patterned with paler.

Pronotum light brown medially, paling to yellow on sides. Mesonotal praescutum light brown with four scarcely differentiated more cinnamon brown stripes that are best indicated by narrow darker brown margins; scutum almost uniformly brown, with delicate yellow setae; scutellum and postnotum yellow. Pleura, including the dorsopleural membrane, yellow. Halteres dark brown, base of stem narrowly yellowed. Legs with coxae and trochanters yellow; femora and tibiae brownish yellow, tips narrowly darker brown; tarsi light brown; claws of male bispinous, outer spine obtuse. Wings light brown, paler in outer end of cell *R,* much of *M,* and bases of cubital and anal cells; prearcular and costal regions, with the stigma, brown; two very small brown spots, at base and at near midlength of cell *M* adjoining vein *Cu;* veins brown. Veins behind vein *R* glabrous. Venation: *Rs* relatively long, about two and one-half times R_{2-3}; cell R_3 moderately constricted at near midlength; *m-cu* at near two-thirds M_{3-4}.

Basal abdominal tergites reddish brown, sides slightly darker, sternites and hypopygium yellowed, segments seven and eight blackened to form a ring, tergites five and six narrowly darkened medially. Male hypopygium (Fig. 67) with tergite, *t,* as viewed from above, terminating in two low transverse lobes with slender setae, the posterior faces long-oval, with abundant blackened spinoid setae. Outer dististyle, *d,* slender, narrowed outwardly, apex glabrous, obtuse; inner style with outer plate broadly subtriangular in outline, with dense small blackened spinoid setae, lower blade with relatively few marginal points.

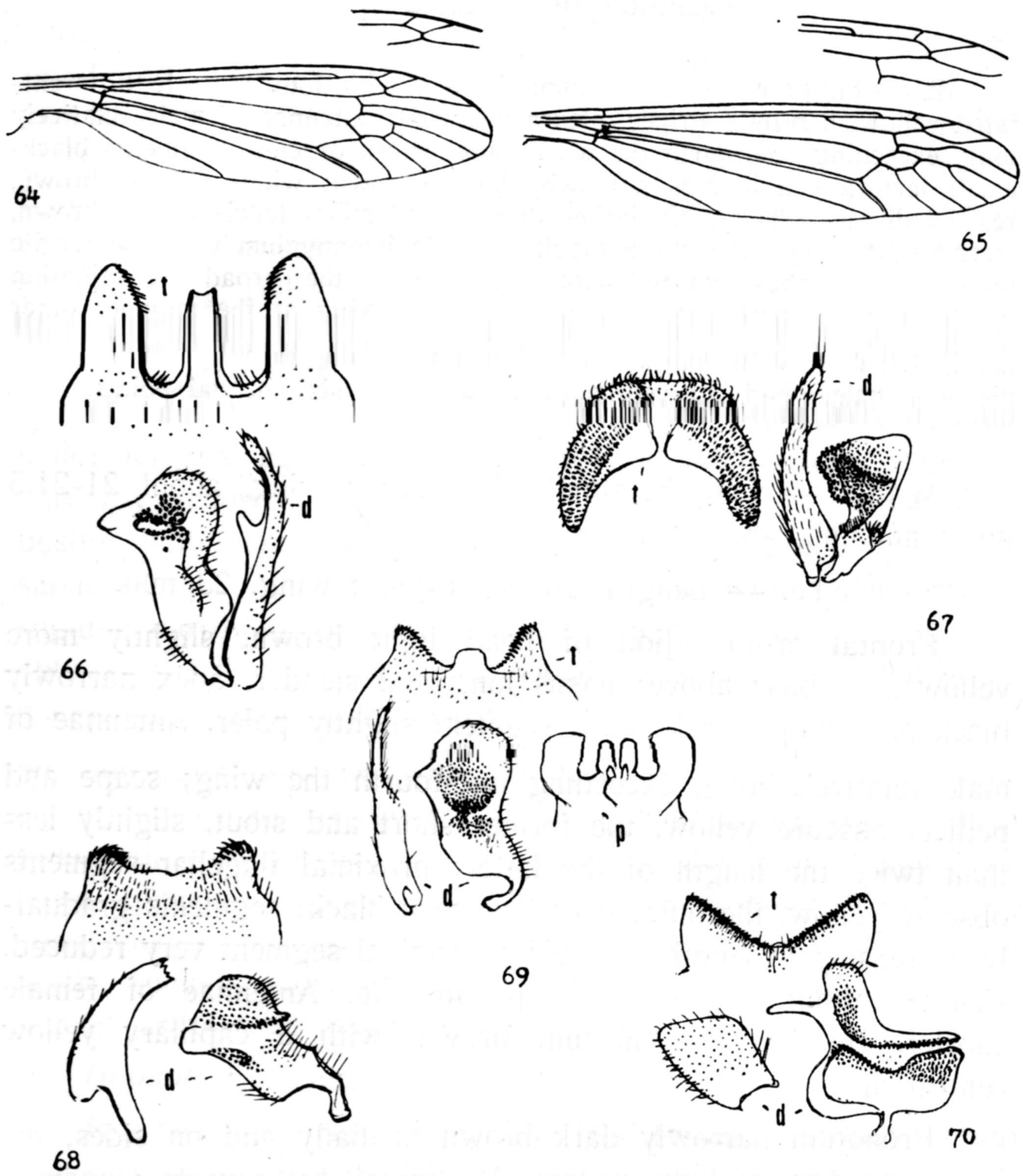

Fig. 64. *Valdivia shannonina* Alexander; venation. — Fig. 65. *Zelandotipula strangalia* (Alexander); venation. — Fig. 66. *Zelandotipula austrofurcifera* sp. n.; male hypopygium. — Fig. 67. *Zelandotipula corynostyla* sp. n.; male hypopygium. — Fig. 68. *Zelandotipula diducta* sp. n.; male hypopygium. — Fig. 69. *Zelandotipula perobtusa* sp. n.; male hypopygium. — Fig. 70. *Zelandotipula retrorsa* sp. n.; male hypopygium. — Symbols: *d*, dististyles; *p*, phallosome; *t*, tergite.

Habitat: Colombia.

Holotype, ♂, Monteredondo, Cundinamarca, altitude 1,420 meters, January-February 1959 (Juan Foerster).

From the other relatively numerous species of the genus that have a small darkened brown spot at near midlength of cell *M* of the wings, the present fly is best distinguished by the length and coloration of the male antennae and especially by the hypopygial structure, including the tergite and both dististyles.

Zelandotipula diducta sp. n.

Mesonotal praescutum cinnamon brown, with four vaguely differentiated yellowish brown stripes, pleura yellowed; antennae of male relatively long, exceeding one-fourth the wing, outer seven or eight segments blackened; femora yellow, tips narrowly darker brown; wings fulvous brown, restrictedly patterned with darker brown; abdominal tergites light brown, sternites and hypopygium light yellow; male hypopygium with the tergite broad, outer lobes obtuse, with black setae, the broad emargination nearly truncate, with sparse setae that are lacking at the midline; outer dististyle pale, gently curved, apex with five or six unequal points.

Male. — Length, about 15-16 mm.; wing, about 21-21.5 mm.; antenna, about 5.7-5.8 mm.

Female. — Length, about 21 mm.; wing, 23 mm.

Frontal prolongation of head light brown, slightly more yellowed at base above; nasus long and slender, apex narrowly blackened; palpi black, third segment slightly paler. Antennae of male relatively long, exceeding one-fourth the wing; scape and pedicel obscure yellow, the former short and stout, slightly less than twice the length of the latter; proximal flagellar segments obscure yellow, the outer ones brownish black; segments gradually decreasing in length outwardly, terminal segment very reduced, slender, about one-sixth the penultimate. Antennae of female shorter. Head above chestnut brown, with a capillary yellow central line.

Pronotum narrowly dark brown medially and on sides, the intervening space light yellow. Mesonotal praescutum cinnamon brown with four vaguely differentiated yellowish brown stripes, humeral and lateral borders somewhat darker brown; scutum dark brown, scutellum even darker; mediotergite grayish brown, posterior fourth yellowed, with a capillary central brown vitta; pleurotergite light brown with a small darker brown discal spot; scutellum and mediotergite with conspicuous pale setae, the latter porrect. Pleura yellowed, with a short brown dorsal stripe on propleura and dorsal anepisternum; dorsopleural region conspicuously light yellow. Halteres with stem light brown, base of knob darker, apex vaguely pale. Legs with coxae and trochanters yellow; femora light brown, tips narrowly darker brown, involving about one-sixth of the segment; tibiae brownish black, tarsi brownish yellow; claws of male bidentate. Wings strongly fulvous brown, restrictedly patterned with darker brown, including a postarcular area in bases of cells *R* and *M,* and a smaller spot at origin of *Rs;* stigma large, brown; cell *C* yellow, outer end weakly

darkened, cell R_1 before stigma extensively light yellow; very small and indistinct yellowed areas near bases of cells *M* and *2nd* M_2 and at margin of *1st A;* veins light brown, basal fourth of *Rs* darker. Veins behind *R* glabrous, R_{4-5} with very few microscopic punctures. Venation: Cell R_3 moderately constricted; petiole of cell M_1 subequal to *m; m-cu* at from about one-half to three-fourths M_{3-4}; cell *2nd A* relatively narrow.

Abdomen relatively short in both sexes, especially in the male; tergites light brown, incisures of intermediate segments narrowly yellowed, sternites and hypopygium light yellow. Ovipositor with cerci slender, straight, narrowed gradually to the subacute tips. Male hypopygium (Fig. 68) with the tergite, *t,* slightly narrowed outwardly, outer angles produced into low obtuse lobes that are densely provided with black setae, the broad intervening emargination nearly truncate, with sparse setae that are lacking at and near the midline. Outer dististyle, *d,* pale, moderately broad, narrower than in *lassula,* gently curved, apex truncated, with five or six unequal pale points to produce an erose appearance; inner style with apex broadly obtuse, the outer hoodlike part with small blackened spinoid setae that extend to the summit, more basally with two other nearly contiguous smaller areas with similar spicules.

Habitat: Ecuador.

Holotype, ♂, San Francisco, Rio Pastaza, altitude 1,300 meters, October 1, 1938 (Wm. Clarke Macintyre). Allotopotype, ♀, Paratopotype, ♂, pinned with the allotype.

Zelandotipula diducta is generally similar to *Z. lassula* (Alexander) and to *Z. triatra* (Alexander), differing in the length and structure of the male antennae and especially in the hypopygium, including the tergite and both dististyles. The ninth tergite in all three species is distinctive, in *lassula* being trilobed, all lobes bearing conspicuous setae; in *triatra* with only two lobes, as in the present fly, these much larger and separated by a narrower emargination.

Zelandotipula perobtusa sp. n.

General coloration brown, praescutum with four brownish yellow stripes that are margined by slightly darker brown, pleura yellow; tips of femora dark brown; wings pale brown, heavily patterned with darker brown and whitened areas; male hypopygium with beak of inner dististyle very short and stout; gonapophysis unusually broad, the tip incurved.

Male. — Length, about 16 mm.; wing, 19 mm.; antenna, about 4.8 mm. Frontal prolongation of head above dark brown, including the long nasus, the base beneath more yellowed; palpi dark brown, terminal segment obscure yellow. Antennae moderately long; proximal three segments yellow, succeeding segments weakly bicolored, brown basally, the outer half obscure yellow, the amount of the latter decreasing on outer segments, the outer three or four uniformly darkened; terminal segment slender, more than one-fourth the penultimate. Head light brown, with a narrow darker brown central line, posterior orbits very narrowly gray.

Pronotum medium brown. Mesonotal praescutum with ground light brown, disk with four brownish yellow stripes that are margined with slightly darker brown; scutum and scutellum medium brown; postnotum paler brown, anterior pleurotergite and pleura light yellow. Halteres brown, base of stem light yellow. Legs with coxae and trochanters yellow; femora and tibiae obscure yellow, tips of femora rather narrowly dark brown, of the tibiae more narrowly so; tarsi brown, claws bidentate, outer tooth larger. Wings with ground pale brown, heavily patterned with darker brown and whitened areas, generally as in *strangalia* and allies; cells *C* and *Sc* uniformly brown; further major darkenings in bases of cells *R* and *M,* at midlength of cell *M,* and in outer radial field with the exception of cell R_5; more restricted brown seams at origin of *Rs* and *m-cu;* the pale pattern includes a prestigmal brightening, major areas before and beyond the darkening in cell *M,* and most of cell R_5; veins brown. Venation: Vein R_{4-5} rather strongly sinuous, constricting cell R_3; *m-cu* at near midlength of M_{3-4}; cells M_4 and *2nd A* broader than in *acutistyla.*

Abdominal tergites light brown, slightly patterned with darker brown on sides, outer segments more extensively darkened, sternites and hypopygium yellowed. Male hypopygium (Fig. 69) with the tergite, *t,* trilobed, median lobe shorter, pale and glabrous, apex truncated, lateral lobes triangular, their mesal margins with abundant short subcultrate blackened spinoid setae. Outer dististyle, *d,* slender, outer third very narrow, apex subacute; inner style broad, beak very short and stout, disk with three groups of small blackened spicules or modified spinoid setae, outer group subcircular in outline, the points very numerous. Phallosome with gonapophyses unusually broad, apices incurved.

Habitat: Peru.

Holotype, ♂, Satipo, Jauja, Junin, altitude 800-900 meters, June 24, 1940 (P. Paprzycki).

The most similar species is *Zelandotipula acutistyla* (Alexander), of Ecuador, which differs in slight details of wing coloration and venation and especially in the hypopygial structure, including the inner dististyle and phallosome. Other species, as *Z. perstrangalia* (Alexander) and *Z. strangalia* (Alexander) are less closely allied.

Zelandotipula retrorsa sp. n.

Mesonotal praescutum light brown with four brownish yellow stripes, pleura testaceous yellow; antennae short; femora yellow, tips brownish black; wings with disk whitened, heavily patterned with dark brown, veins glabrous, cell R_3 strongly constricted; male hypopygium with posterior border of tergite produced, shallowly emarginate, densely set with short blackened cultrate bristles; outer dististyle very broad, the length about one-half greater than the breadth; inner style with beak slender, disk with two longitudinal rows of microscopic pegs or spinoid setae.

M a l e. — Length, about 15-16 mm.; wing, 20-21 mm.; antenna, about 2.4-2.5 mm.

F e m a l e. — Length, about 22 mm.; wing, 23 mm.; antenna, about 2.3 mm.

Frontal prolongation of head shorter than the remainder, dark cinnamon brown; nasus very long and slender, exceeding one-third the prolongation; proximal three palpal segments black, the elongate terminal one darkened basally, outer two-thirds light yellow. Antennae relatively short; scape and pedicel obscure yellow, flagellum brown, outwardly passing into dark brown; terminal segment about one-third longer than the penultimate. Head dark brown, vertex with a capillary darker central line, front and narrow orbits vaguely paler.

Pronotum brown medially, broadly testaceous on sides. Mesonotal praescutum light brown with four light brownish yellow stripes that are very narrowly margined by darker; scutal lobes brownish yellow, patterned with brown; scutellum obscure yellow; postnotum brown, central area of pleurotergite more yellowed. Pleura testaceous yellow, anepisternum and adjoining dorsopleural region weakly infuscated. Halteres dark brown, base of stem yellowed. Legs with coxae and trochanters yellow; remainder of legs very long and slender; femora yellow, with greenish tints, tips brownish black; tibiae light brown, tips narrowly more darkened; tarsi brown, claws simple. Wings with disk whitened, including the prearcular field, heavily patterned with dark brown, Anal cells chiefly light brown, bases whitened; brown areas include a postarcular darkening that entirely crosses the wing, more extensive in bases of cells *R* and *M;* a second

area at near two-thirds the lengths of cells *R* and *M,* not connected with the basal band; other extensive darkened markings at origin of *Rs,* cord, expanded outwardly into the radial cells and basally into cell *M;* outer radial field extensively darkened, leaving the centers of the cells and all but base of cell R_5 paler; cell *C* uniformly light yellow; stigma darker brown; veins dark brown, in vicinity of the stigma with greenish tints. Veins behind *R* glabrous, R_{4-5} with very few microscopic punctures. Venation: Outer section of R_{4-5} strongly sinuous, narrowing cell R_3 at near midlength; cell *1st* M_2 small, pentagonal; *m-cu* close to fork of M_{3-4}.

Abdomen of male relatively short; tergites brownish yellow, patterned with darker brown, sternites yellow; segments six to eight blackened to form a conspicuous ring; extreme bases of segments pale, not apparent in unmounted specimens; hypopygium small, brownish yellow. Male hypopygium (Fig. 70) with posterior border of tergite, *t,* broadly produced into a low lobe, its border shallowly emarginate, densely set with short blackened cultrate bristles, those back from margin longer and more normal. Outer dististyle, *d,* pale, very broad, the length about one-half greater than the breadth; inner style about as figured, beak slender, tip obtuse; dorsal crest erect, with several setae; disk of style with two separate areas of microscopic blackened pegs or spinoid setae, outer group extended backward along the lower margin of a slender extension.

Habitat: Colombia.

Holotype, ♂, Monteredondo, Cundinamarca, altitude 1,420 meters, January 10, 1959 (Juan Foerster). Allotopotype, ♀, January 30, 1959. Paratopotype, ♂, December 11, 1958.

Other generally similar regional species of *Zelandotipula* that have the same general type of wing pattern and with cell R_3 strongly constricted at near midlength, include *Z. acutistyla* (Alexander), *Z. cristifera* (Alexander), *Z. infernalis* (Alexander), *Z. sinuosa* (Alexander), *Z. strangalia* (Alexander), *Z. vivida* (Alexander), and some others. All of these differ among themselves chiefly in hypopygial structure, including the tergite and both dististyles. The very broad outer style of the present fly is distinctive.