

CHARLES P. A. EXANDER

*Bredin-Archbold-  
Smithsonian Biological  
Survey of Dominica:  
The Crane Flies  
(Diptera: Tipulidae)*

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*Smithsonian Biological*  
*Survey of Dominica:*  
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## ABSTRACT

Alexander, Charles P. Bredin-Archbold-Smithsonian Biological Survey of Dominica: The Crane Flies (Diptera: Tipulidae). *Smithsonian Contributions to Zoology*, 45: 1-57. 1970.—The crane fly fauna of the Antillean island of Dominica is discussed, based in chief part on a study of the extensive series of specimens collected by various staff members in entomology of the United States National Museum between 1956 and 1966. The only other island of the Lesser Antilles that had been studied in some detail is Saint Vincent, by Williston (1896). Two islands of the Greater Antilles have been discussed by Alexander, Puerto Rico (1932) and Jamaica (1964a). In this report on Dominica 64 species of Tipulidae are discussed, of which 26 are described as new. Virtually all belong to the subfamily Limoniinae, with only 3 species, distributed in as many genera, in the Tipulinae. In the Limoniinae, 3 tribes are represented, the largest being the Limoniini with 32 species or exactly one-half of those presently known from the island. The largest single genus is *Limonia* Meigen, with 29 species arranged in 6 subgenera, the largest such groups being *Geranomyia* Haliday with 13 species and *Rhipidia* Meigen with 8. The second most important tribe is the Eriopterini, with 23 species belonging to 7 genera, the largest genus being *Gonomyia* Meigen with 10 species in 4 subgenera. The third tribe, the Hexatomini, has only 6 species in 5 genera. Only 2 genera, *Limonia* Meigen and *Gonomyia* Meigen, have 10 or more species. Of the total of 28 genera and subgenera in the Dominican fauna no fewer than 19 are represented by a single species each. The following new taxa are described:

*Eriopterodes*, new genus; *Nephrotoma dominicana*, new species; *Tipula* (*Microtipula*) *carib*, new species; *Limonia* (*Caenoglochina*) *wirthiana*, new species; *L.* (*Dicranomyia*) *clarkeana*, new species; *L.* (*Neolimonia*) *gurneyi*, new species; *L.* (*Geranomyia*) *caribica*, new species; *L.* (*G.*) *neptis*, new species; *L.* (*G.*) *spangleri*, new species; *L.* (*Rhipidia*) *eremnocera*, new species; *L.* (*R.*) *steyskali*, new species; *Orimarga* (*Orimarga*) *nimbicolor*, new species; *O.* (*Diotrepha*) *bifidaria*, new species; *Epiphragma* (*Epiphragma*) *caribica*, new species; *Shannonomyia urophora*, new species; *Elephantomyia* (*Elephantomyia*) *pertenuis*, new species; *Teucholabis* (*Teucholabis*) *fulviventris*, new species; *T.* (*T.*) *tenella*, new species; *Gonomyia* (*Gonomyia*) *dominicana*, new species; *G.* (*Lipophleps*) *acanthomelana*, new species; *G.* (*Paralipophleps*) *cultriformis*, new species; *G.* (*P.*) *dikopsis*, new species; *G.* (*P.*) *wirthiana*, new species; *Eriopterodes celestis dominicana*, new subspecies; *Erioptera* (*Mesocyphona*) *gagneana*, new species; *Toxorhina* (*Toxorhina*) *carunculata*, new species; *T.* (*T.*) *polytricha*, new species; *T.* (*T.*) *subfragilis*, new species.

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Charles P. Alexander

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The crane fly materials upon which the present paper is based in chief part were collected by staff members of the United States National Museum. A relatively few further specimens were derived from other sources, as discussed later. Types of the new species here described are in the United States National Museum.

Members of the museum staff who participated most actively in the Bredin-Archbold Survey include J. F. G. and Thelma Clarke (1956, 1965), R. J. Gagné (1966), A. B. Gurney (1966), P. J. Spangler (1964), G. C. Steyskal (1966), and especially W. W. Wirth (1965). Fewer specimens have been taken by D. M. Anderson (1965), R. T. Bell (1965), D. F. Bray (1964), D. R. Davis (1965), O. S. Flint (1966), and D. L. Jackson (1965). The flies were collected in various manners, chiefly by general sweeping with nets, by Malaise traps, at light, or by means of light traps. A very few species were represented by reared materials, as discussed under *Limonia (Geranomyia) spangleri*, new species, *L. (Rhipidia) domestica* (Osten Sacken), and *L. (R.) subpectinata* (Williston). In addition to the above there were a small number of miscellaneous unreared larvae that are not discussed further at this time.

Apparently, the first crane flies to be collected on Dominica were taken by Dr. Walter H. Hodge in 1938,

as discussed in some detail in a paper by the writer (Alexander, 1939b:91-100; see *Literature Cited* at conclusion of report). Dr. Hodge secured representatives of 14 species of Tipulidae, of which 8 were described as new in the paper cited. His principal collecting stations included Morne Trois Pitons, mentioned briefly later under the account of *Leptotarsus (Longurio) hodgei* (Alexander), at the Hatton Garden and Sylvania Estates, and along the interconnecting Hatton Garden Trail. Papers by Hodge (1941, 1942), and the interesting early account of Dominica by Ober (1880) are listed under *Literature Cited*. In addition to the collectors named, a few further specimens were taken in November 1967 by Noël L. H. Krauss, of Honolulu.

The species treated in the present paper may be considered as being representative of the crane fly fauna of the island, but it seems certain that many further species will be added by later collecting. In comparing the Tipulidae of Dominica with other West Indian islands, attention may be called to detailed discussions by the writer covering Puerto Rico (1932) and Jamaica (1964a). For the Lesser Antilles, the only detailed account is a report by Williston (1896) discussing the species of Saint Vincent, likewise in the Windward Islands and located some two degrees of latitude to the south, separated from Dominica by the islands of Martinique and Saint Lucia. Williston's list of species from Saint Vincent includes 23 species of

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which the following have not been collected in Dominica: *Nephrotoma elegantula* (Williston); *Tipula* (*Microtipula*) *subinfuscata* Williston; *Limonia* (*Geranomyia*) *lycaon* Alexander, as *pallida* Williston, preoccupied; *Limonia* (*G.*) *rostrata antillarum* Alexander, as *rostrata* Say; *Limonia* (*Rhipidia*) *unipectinata* (Williston); *Orimarga* (*Diotrepha*) *concinna* (Williston); *O. (D.) mirabilis* (Osten Sacken); *Epiphragma* (*Epiphragma*) *sackeni* Williston; *Elephantomyia* (*Elephantomyia*) *meridionalis* Alexander, as *longirostris* Williston, preoccupied; *Trentepohlia*

(*Paramongoma*) *manca* (Williston); *Trentepohlia* (*P.*) *pallida* (Williston); *Teucholabis* (*Teucholabis*) *complexa* Osten Sacken; *Gonomyia* (*Paralipophleps*) *pleuralis* (Williston); and *Erioptera* (*Erioptera*) *annulipes* Williston. Certain of the above are based on erroneous identifications, but some of the valid species presumably will be found to occur in Dominica. A small number may be found to be restricted to Saint Vincent and, conversely, it appears that certain of the Dominican species described at this time will be found to be restricted to this island.

## Systematic Treatment

### Key to Subfamilies and Tribes of TIPULIDAE

1. Terminal segment of maxillary palpus commonly elongate; nasus usually distinct; antennae with 13 segments; size large (wing of local species 12 mm or more); venation (Figures 1-3)
  - Tipulinae
  - Terminal segment of maxillary palpus short; no distinct nasus; antennae commonly with either 14 or 16 segments, fewer in *Toxorhina* where 5 or 6 flagellar segments are united to form a basal fusion segment; size small (wing of local species commonly less than 10 mm); venation (Figures 7, 29-31, 36-41, 44-47, 60-64) ..... Limoniinae 2
2. Wings with free tip of vein  $Sc_2$  often preserved; veins  $R_4$  and  $R_5$  fused to margin, there being only 2 branches of  $R_s$ : venation (Figures 7, 27-31); antennae with 14 segments (*Limonia*) or with 16 segments (*Helius*, *Orimarga*) ..... Limoniini
- Wings with free tip of vein  $Sc_2$  lacking; veins  $R_4$  and  $R_5$  separate, the former usually transferred to the upper branch of the sector to form an element  $R_{3+4}$ ; usually with 3 branches of  $R_s$ , with 2 such branches in *Atarba* (Figure 40), *Elephantomyia* (Figure 41), *Teucholabis* (Figure 44), and in some *Gonomyia* (Figures 46, 47), in *Toxorhina* (Figure 64), with a single branch; antennae usually with 16 segments, except in *Toxorhina*, as stated in couplet 1b ..... 3
3. Legs with tibial spurs present; venation (Figures 36-41) ..... Hexatomini
- Legs with tibial spurs lacking; venation (Figures 44-47, 60-64) ..... Eriopterini

## TIPULINAE

### Key to Genera of TIPULINAE

1. Wings (Figure 2) with vein  $Sc$  short,  $Sc_2$  opposite origin of  $R_s$ ; cell  $M_1$  elongate, sessile; vein  $M_4$  originating before base of cell  $1st M_2$  ..... (*N. dominicana*, new species)
  - Nephrotoma* Meigen
  - Wings (Figures 1, 3) with vein  $Sc$  longer,  $Sc_2$  beyond midlength of  $R_s$ ; cell  $M_1$  shorter, petiolate; vein  $M_4$  originating at outer end of cell  $1st M_2$  ..... 2
2. Wings (Figure 1) with vein  $Sc_1$  preserved, ending beyond level of fork of  $R_s$ ;  $r-m$  reduced by approximation of veins  $R_{4+5}$  and  $M_{1+2}$ ; antenna with terminal segment long, subequal to the penultimate, verticils of outer flagellar segments very long, exceeding the segments (*L. hodgei* Alexander) *Leptotarsus* Guérin-Méneville
- Wings (Figure 3) with vein  $Sc_1$  atrophied,  $Sc_2$  joining  $R$  before the fork of  $R_s$ ,  $r-m$  elongate; antenna with terminal segment reduced, oval, less than one-fifth the penultimate, verticils of outer flagellar segments shorter than the segments
  - (*T. carib*, new species) *Tipula* Linnaeus

Genus *Leptotarsus* Guérin-Méneville

*Leptotarsus* Guérin-Méneville, 1838, p. 286.

Subgenus *Longurio* Loew; 1869, page 3.*Leptotarsus (Longurio) hodgei* (Alexander), 1939

FIGURES 1, 4

*Tanypremna (Tanypremna) hodgei* Alexander, 1939b, pp. 92-93, figs. 1, 10.

The types were from Morne Trois Pitons, Dominica, altitude 1,371.6 m (4,500 ft), taken 15 August 1938 by W. H. Hodge. Dr. Hodge made the following observations concerning this species: "Collected on one of the two lesser summits of Morne Trois Pitons, in typical wind-dwarfed, rain-swept cloud forest, the branches of the trees dripping with mosses and hepatics and laden with other epiphytes, particularly water-containing bromeliads. This species occurred in dozens, many mating. The few I managed to pick up I had to stalk after they had alighted beneath the shelter of the leaves."

The further specimens now available show some differences in coloration, especially the darker wings, and in having cell *2nd A* narrower than in the type (Figure 1). The male hypopygium (Figure 4) has the 2 spinoid setae near apex of the inner dististyle, *d*, more reduced and with a strong tubercle tipped with a very stout spinoid seta on disk of the style, this not present in the type-material. The specimens available have the powerful spine at base of the inner dististyle and strong setae on the rounded gonapophyses, but despite these differences appear to represent a single species. The fly originally was described as a *Tanypremna* but seems more correctly placed in *Longurio* Loew, both names now considered as being subgenera in the major genus *Leptotarsus*, as here treated. It has become increasingly difficult to maintain these two groups as distinct.

DOMINICA.—Morne Trois Pitons, 1,371.6 m (4,500 ft), 15 August 1938 (Hodge). D'leau Gommier, 17 March 1956 (Clarke); 16 March 1965 (Wirth). Pont Casse, 23 November 1964 (Spangler); 804.7 m (0.5 mile) east of Pont Casse, 11 April 1966 (Gagné) 4,828 m (3 miles) east, 13-16 October 1966 (Gurney). Fresh Water Lake, 762 m (2,500 ft), 5 April 1966 (Gagné).

Genus *Nephrotoma* Meigen

*Nephrotoma* Meigen, 1803, p. 262.

*Nephrotoma dominicana*, new species

FIGURES 2, 5

General coloration of mesonotum yellow, praescutum with 3 chestnut brown stripes, anterior third of median area with sides blackened, lateral stripes straight; knob of halteres brownish black; legs obscure yellow, outer segments brownish black, claws toothed; wings faintly tinted, cell *Sc* and stigma darker brown, extreme wing tip weakly infuscated; male hypopygium with distal third of outer dististyle long and slender, inner style with beak broadly obtuse, posterior crest produced into an obtuse blade, outer basal lobe a small darkened knob; 8th sternite with dense fringes of long yellow setae, the median membrane densely reticulated.

MALE.—Length about 10-13 mm; wing 9.5-10.5 mm; antenna about 3.8-4.2 mm.

FEMALE.—Length about 14-15 mm; wing 11-12 mm.

Frontal prolongation of head polished yellow, nasus elongate, brownish black, with black setae; palpi brown, basal segment yellowed. Antennae of male relatively long; scape brownish yellow, pedicel and 1st flagellar segment dark brown, remainder of flagellum more blackened; segments only moderately incised, verticils short. Head orange, including the low entire vertical tubercle; occipital brand inconspicuous, pale brown, subtriangular, the anterior end rounded.

Pronotal scutum yellowed on central part, more obscured on sides, scutellum yellow medially and on sides, intermediate areas dark brown. Mesonotal praescutum yellow, with 3 chestnut brown stripes, the broader central area narrowed posteriorly, reaching the suture, lateral borders of anterior third black; lateral stripes straight, chestnut brown, in cases very faint, cephalic end more darkened but not outcurved; scutum with median area broadly yellow, lobes chestnut brown, cephalic part with 2 virtually separate brown marks, lateral end of outer one blackened at suture; scutellum light brown, parascutella yellow; postnotum chiefly yellow, anterior part of disk of mediotergite more fulvous, pleurotergite with a narrow darkened stripe that separates the anapleurotergite from the katapleurotergite; scutellum and mediotergite with sparse short setae. Pleura light yellow, with vague more reddened areas, more evident on anepisternum



FIGURES 1-6.—Venation: 1, *Leptotarsus (Longurio) hodgei* (Alexander); 2, *Nephrotoma dominicana*, new species; 3, *Tipula (Microtipula) carib*, new species. Male hypopygium: 4, *Leptotarsus (Longurio) hodgei* (Alexander); 5, *Nephrotoma dominicana*, new species; 6, *Tipula (Microtipula) carib*, new species. [SYMBOLS: *b*, basistyle; *d*, dististyle; *p*, phallosome; *pr*, proctiger; *8s*, 8th sternite; *9s*, 9th sternite; *t*, tergite.]



and ventral sternopleurite. Halteres with stem dark brown, base reddened, knob brownish black. Legs with coxae and trochanters yellow; femora obscure yellow, base clearer, outer end vaguely more darkened; tibiae brownish yellow; tarsi gradually darkening to brownish black; claw of male with a single tooth just before midlength. Wings (Figure 2) very faintly tinted, cell *C* brownish yellow, *Sc* and the stigma darker brown; extreme wing tip in cells *R*<sub>3</sub> to *M*<sub>1</sub> weakly infuscated; veins dark brown. About 5 trichia in stigma, lacking in outer wing cells. Venation: cell *M*<sub>1</sub> narrowly sessile; *m-cu* shortly before fork of vein *M*<sub>4</sub>.

First abdominal tergite yellowed, with paired pale brown spots on either side; 2nd tergite yellow, darkened centrally before midlength and near apex; succeeding tergites chiefly dark brown, incisures yellow, more extensive on bases of segments; sternites yellow, restrictedly pale brown at posterior ends, appearing as paired darkenings that are more extensive and confluent on outer segments; hypopygium yellowed. Male hypopygium (Figure 5) with lateral tergal lobes, *t*, appearing as glabrous blades, the tips obtuse; spinoid setae in two groups, with smaller pegs at margin. Outer dististyles, *d*, with outer third long and slender; inner style with beak broadly obtuse, lower margin slightly produced and blackened, lower beak black; posterior crest produced into a broadly obtuse blade; outer basal lobe a small darkened knob that is tipped with a few weak setae; aedeagus short and stout, the subtending apophyses subhyaline, long and narrow, tips obtuse. Eighth sternite, *8 s*, with posterior border slightly concave, with dense fringes of very long yellow setae with incurved tips, forming conspicuous brushes; additional to the setae, with a central membrane including many microscopic areolae to produce a densely reticulate appearance (not shown in figure).

Holotype, male, Cabrit Swamp, Dominica, 23 February 1965 (Wirth). Allotype, female, South Chiltern, 8–10 December 1964 (Spangler). Paratypes, male, female, with allotype: female, Laboviere, October 1967 (Krauss); male, Pont Casse, 12–14 October 1964 (Spangler).

*Nephrotoma dominicana* is quite distinct from *N. elegantula* (Williston), described from Saint Vincent. This has the pattern of the mesonotum with outcurved praescutal stripes and with the tips of the femora and tibiae blackened. Other species from the Greater Antilles include *N. circumscripta* (Loew), from Cuba and

Jamaica, and *N. glabricristata* Alexander, from Hispaniola (Haiti) and Cuba, both different from the present fly.

### Genus *Tipula* Linnaeus

*Tipula* Linné, 1758, p. 585.

### Subgenus *Microtipula* Alexander

Subgenus *Microtipula* Alexander, 1912b, page 360, figs. 1, q.

### *Tipula (Microtipula) carib*, new species

FIGURES 3, 6

General coloration of thoracic dorsum chestnut brown, pleura yellowed; antennae of male elongate, in the extreme cases only a little shorter than the wing; legs brown, tarsi brownish black; wings weakly infuscated, cells *C* and *Sc* more darkened, stigma small; abdominal tergites brown, 7th segment more blackened, sternites and hypopygium yellowed; male hypopygium with posterior border of tergite gently emarginate, producing 2 broad lateral lobes and a smaller central protuberance; proximal end of basistyle with a blackened scabrous appendage; outer dististyle long and narrow, inner style outwardly with 2 glabrous blades and a long black spine.

MALE.—Length about 12–13 mm; wing 10.5–12 mm; antenna about 5.5–11 mm.

FEMALE.—Length about 15 mm; wing 13 mm; antenna about 4 mm.

Frontal prolongation of head yellowish brown; nasus short and stout; palpi obscure yellow, terminal segment very long, exceeding in length the combined basal segments. Antennae of male elongate, very variable in length, as shown by the measurements; scape and pedicel obscure yellow, 1st flagellar segments yellow to brownish yellow with outer ends slightly darker, outer segments black; segments long-cylindrical, basal enlargements oval, verticils much shorter than the segments. Head light brown.

Pronotum dark brown, sides broadly more yellowed. Mesonotum almost uniformly chestnut brown, humeral region of praescutum vaguely more darkened. Pleura and katapleurotergite yellowed, clearer ventrally. Halteres with stem weakly darkened, knob brownish black. Legs with all coxae and trochanters clear light yellow; femora and tibiae brown, the long tarsi

brownish black. Wings (Figure 3) weakly infuscated, cells *C* and *Sc* light to darker brown; stigma small, in most specimens paler brown, in cases larger and darker; veins brown. Venation: *Sc*<sub>2</sub> about opposite two-thirds *Rs*; cell *M*<sub>1</sub> variable in length, from subequal to its petiole to about three times this length; cell 2nd *A* long and narrow.

Abdomen elongate in both sexes; tergites brown to dark brown, the basal rings usually more yellowed; 7th segment more intensely blackened; sternites and hypopygium yellowed. Male hypopygium (Figure 6) with tergite, *t*, transverse, posterior border with 2 low lateral lobes, marginally with strong black setae; median emargination of similar outline, produced into a small more glabrous central lobe; posterior border beneath more thickened, extended laterally, tipped with about 8 shorter and stouter black setae, on either side of ventral surface with a longitudinal area with rows of delicate yellow setae. Proctiger, *pr*, without blackened points. Basistyle, *b*, on mesal face near apex with a low lobe that is provided with delicate setulae and sparse yellow setae; mesal face nearer base with a conspicuous blackened corrugated lobe or appendage. Outer dististyle, *d*, long and narrow, with darkened setae; inner style shorter and broader, terminating in 2 glabrous blades that are separated by a narrow notch, with a powerful more basal arm that is extended into a long straight black spine. Median appendage of 9th sternite, *9s*, appearing as 2 divergent lobules provided with abundant yellow setae. Phallosome, *p*, including small paddle-like gonapophyses at

base of the slender aedeagus.

Holotype, male, Fond Figues River, 121.9 m (400 ft), 29 April 1966 (Gagné). Allotype, female, along Falls trail, 4,828 m (3 miles) east of Pont Casse, 13–16 October 1966 (Gurney). Paratopotypes, males and females, in rain forest, 3 February 1965, 9–12 March 1965 (Wirth); 28 April 1966 (Gagné). Paratypes, with the allotype, 16 October 1966 (Gurney); male, D'leau Gommier, 10 March 1966 (Wirth); males and females, Pont Casse, 12–14 October, 23–30 November, 8–10 December 1965 (Spangler); 2,414 m (1.5 miles) west of Pont Casse, 3 April 1965 (Davis), 2,736 m (1.7 miles) east of Pont Casse, 10 March 1965 (Wirth); 1 male, along trail, 1,609 m (1 mile) north of junction of roads to Rosalie and Castle Bruce, 396 m (1,300 ft), 23 April 1966 (Gagné).

Other members of the subgenus *Microtipula* known from the Windward Islands include the very different *Tipula* (*Microtipula*) *bruesi* Alexander, of Grenada, and *T. (M.) subinfuscata* Williston, of Saint Vincent. The latter fly remains unknown to me but can scarcely be referred to the present species because of the coloration, especially of the legs, which are described as being yellow with the tip of the tibia and most of the tarsi black. Williston makes no mention of the male hypopygium in his species, this being quite distinctive for the present fly. The blackened corrugated appendage of the basistyle in this species likewise occurs in several other species of the subgenus elsewhere in tropical America. In the present fly the unusual range in length of the male antennae should be emphasized.

## LIMONIINAE

### LIMONIINI

#### Key to Genera of LIMONIINI

1. Wings (Figure 29) with vein *R*<sub>2</sub> lacking. . . (*H. albitarsis* Osten Sacken) *Heliis* Saint-Fargeau  
Wings (Figures 30, 31) with vein *R*<sub>2</sub> present, transverse in position, simulating a crossvein. . . 2
2. Wings (Figures 30, 31) with *m-cu* some distance before the fork of *M*, at least three times its own length and usually more; antennae 16-segmented. Separate key  
*Orimarga* Osten Sacken  
Wings (Figure 7) with *m-cu* close to the fork of *M*, when before the fork the distance not or scarcely exceeding its own length; antennae 14-segmented. Separate key. . . *Limonia* Meigen

**Genus *Helius* Saint-Fargeau***Helius* Saint-Fargeau, 1825, p. 831.*Rhamphidia* Meigen, 1830, p. 281.***Helius (Helius) albitarsis* (Osten Sacken), 1887**

FIGURE 29

*Rhamphidia albitarsis* Osten Sacken, 1887, p. 184.*Helius (Helius) albitarsis*.—Alexander, 1964a, pp. 16–17, fig. 5.

The type, a male, was from Puerto Rico, collected prior to 1860 by Carl A. Moritz. The species is known from Cuba and Jamaica, Saint Vincent, and from Central America and northern South America.

DOMINICA.—321.8 m (0.2 mile) east of Pont Casse, 6 May 1966 (Gagné).

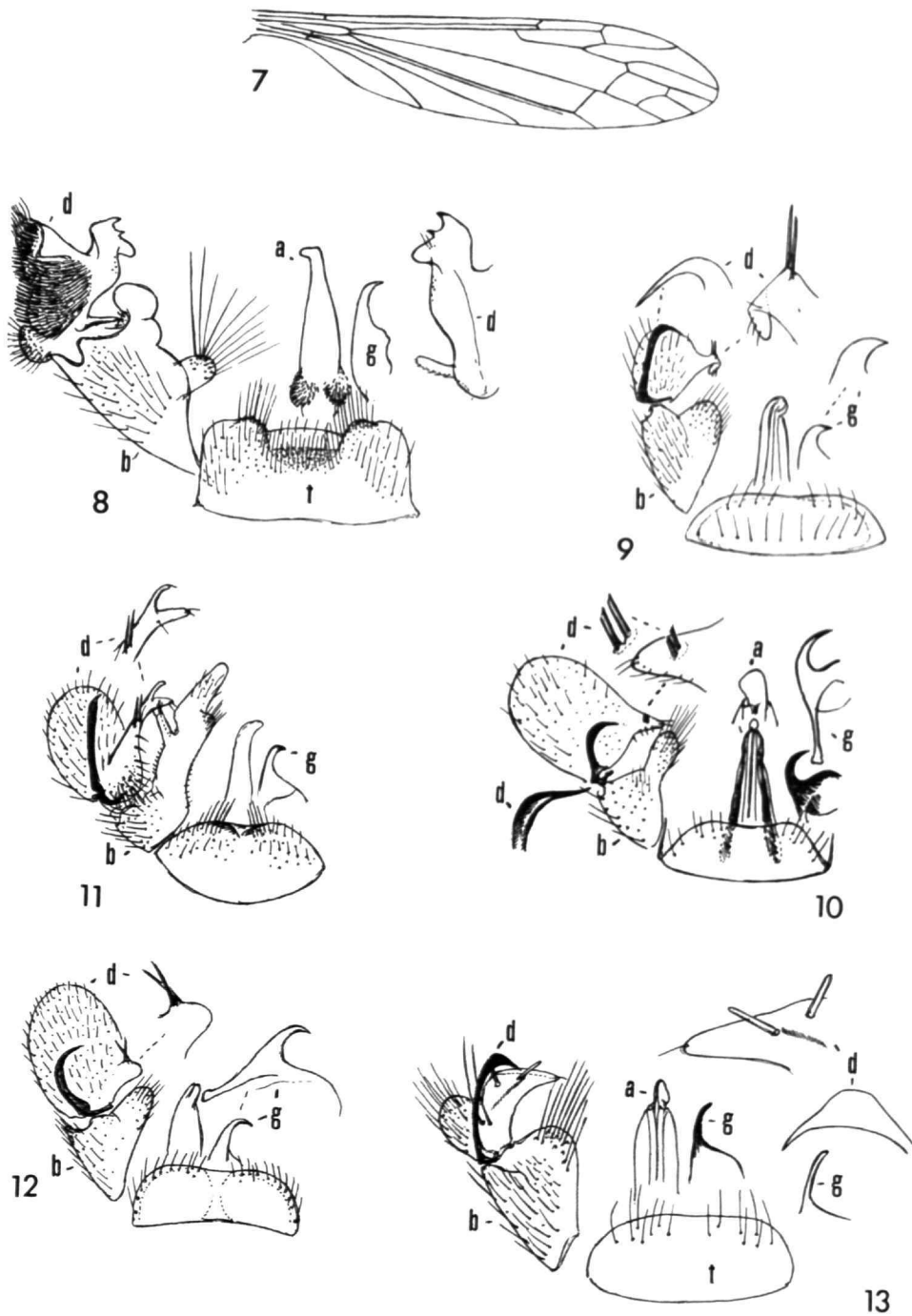
The venation is shown (Figure 29).

**Genus *Limonia* Meigen***Limonia* Meigen, 1803, p. 362.*Limnobia* Meigen, 1818, p. 116.*Limonia*.—Alexander, 1967, pp. 279–344.**Subgenus *Caenoglochina* Alexander, 1964a; page 31****Subgenus *Dicranomyia* Stephens, 1829; page 53****Subgenus *Geranomyia* Haliday, 1833; page 154****Subgenus *Neoglochina* Alexander, 1967; page 316****Subgenus *Neolimonia* Alexander, 1964a; page 320****Subgenus *Rhipidia* Meigen, 1818; page 153****Key to Subgenera of *Limonia***

1. Mouthparts and especially the labial palpi elongate, the rostrum so formed much longer than the head and commonly about equal to the combined head and thorax or longer; wings with a supernumerary crossvein at near midlength of cell *Sc*. Separate key  
*Geranomyia* Haliday  
Mouthparts not conspicuously lengthened, shorter than the remainder of head..... 2
2. Antennae with flagellar segments produced into long branches or shorter ventral protuberances to produce a bipectinate, unipectinate, or subpectinate appearance in the males (Figure 28), the protuberances usually shorter in the females. Separate key..... *Rhipidia* Meigen  
Antennae with flagellar segments simple, oval to more elongate..... 3
3. Wings (Figure 7) with vein *Sc* short, ending opposite, before or only a short distance beyond origin of *Rs*. Separate key..... *Dicranomyia* Stephens  
Wings with vein *Sc* longer, *Sc*<sub>1</sub> ending about opposite two thirds the length of *Rs* or beyond. . 4
4. Wings with vein *R*<sub>1</sub> deflected caudad, reducing vein *R*<sub>2</sub> to a short element that is only about one third the free tip of *Sc*<sub>2</sub> which is in transverse alignment or virtually so; male hypopygium with dorsal dististyle present; rostral spines of ventral style lacking, replaced by an oval depressed area..... (*N. insularis* Williston) *Neoglochina* Alexander  
Wings with veins *R*<sub>1</sub> and *R*<sub>2</sub> nearly parallel, *R*<sub>2</sub> not conspicuously shortened, subequal to the free tip of *Sc*<sub>2</sub>; male hypopygium with dorsal dististyle present or lacking, when present (*Neolimonia*) rostral spines 2, placed far basad on the rostral prolongation..... 5
5. Male hypopygium (Figure 13) with dorsal dististyle present; rostral spines 2, widely separated, near base of prolongation; basistyle with a large simple obtuse ventromesal lobe..... (*N. gurneyi*, new species) *Neolimonia* Alexander  
Male hypopygium (Figure 8) without a dorsal dististyle; ventral style with variously modified accessory lobes but without rostral spines; basistyle with variously modified smaller lobes  
(*C. apicata* Alexander) *Caenoglochina* Alexander

**Subgenus *Caenoglochina* Alexander, 1939*****Limonia (Caenoglochina) apicata dominicensis* Alexander, 1939***Dicranomyia apicata* Alexander, 1914, pp. 225–226.*Limonia (Caenoglochina) apicata* (Alexander), 1964a, p. 31.*Limonia (Caenoglochina) apicata dominicensis* Alexander, 1939b, pp. 93–94, fig. 13.

Types from Layou River, on Hatton Garden Trail, 548.6–609.6 m (1,800–2,000 ft), 16–29 August 1938 (Hodge). Cabrit Swamp, 23 February 1965, light trap (Wirth); Carholm Estate, 7 February 1965 (Wirth); Clarke Hall, 8–31 January, 1–10 March 1965 (Wirth); Fond Figue River, 121.9 m (400 ft), 12 April 1966 (Gagné); Manets Gutter, 10 March 1965 (Wirth);



FIGURES 7-13—Venation: 7, *Limonia (Dicranomyia) clarkeana*, new species. Male hypopygium: 8, *Limonia (Caenoglochina) wirthiana*, new species; 9, *Limonia (Dicranomyia) alfaroi* (Alexander); 10, *Limonia (Dicranomyia) clarkeana*, new species; 11, *Limonia (Dicranomyia) divisa* Alexander; 12, *Limonia (Dicranomyia) omissa* (Alexander); 13, *Limonia (Neolimonia) gurneyi*, new species; [SYMBOLS: a, aedeagus; b, basistyle; d, dististyle; g, gonapophysis; t, tergite.]

Pont Casse, 321.8 m (0.2 miles) east, May 1966 (Gagné); South Chiltern Estate, 2 February 1965 (Wirth).

*Limonia (Caenoglochina) wirthiana*, new species

FIGURE 8

General coloration of mesonotum obscure yellow, pleura clearer yellow; antennae of male relatively long, flagellar segments conspicuously nodulose, with long abrupt apical pedicels; wings faintly tinged with brown, stigma darker, *Sc* long; male hypopygium with conspicuous tergal lobes; basistyle with the ventromesal lobe at proximal end, provided with very long setae; dististyle quite complex, massive, the body with an extensive cushion of spinoid setae, rostral prolongation smaller, the margin trilobed.

Male.—Length about 5.5 mm; wing 6 mm; antenna about 2.1 mm.

Rostrum brownish black; palpi black. Antennae with scape and pedicel slightly paler than the uniformly blackened flagellum; flagellar segments conspicuously pedicelled to produce a nodulose appearance; proximal segments shorter and broader, the abrupt pedicel about one-half as long as base, outer 3 or 4 segments progressively more elongate, the pedicels somewhat shorter but exceeding one-third the base; longest verticils shorter than the enlargements. Head dark brown, sparsely pruinose, with long erect black setae; anterior vertex reduced to a very narrow strip.

Prothorax very reduced, brownish yellow, pretergites clearer yellow. Mesonotum obscure yellow, praescutum with a slightly darker central stripe, pale brown and better defined on anterior half; interspaces with sparse black setae, longer and more erect on anterior part. Pleura clearer yellow, especially on ventral half, vaguely more obscured anteriorly. Halteres with stem obscure yellow, clearer basally, knob large, brownish black. Legs with coxae yellow, fore pair vaguely darker;

trochanters yellow; remainder of legs yellowish brown to very pale brown. Wings faintly tinged with brown, stigma oval, darker brown; veins brown. Venation: *Sc* long, *Sc*<sub>1</sub> ending shortly before the fork of *Rs*, *Sc*<sub>2</sub> close to its tip; cell *1st M*<sub>2</sub> short-rectangular, shorter than any of the veins beyond it; *m-cu* just before the fork of *M*.

Abdominal tergites dark brown, darker laterally, sternites abruptly light yellow. Male hypopygium (Figure 8) distinctive, especially as regards the tergite, basistyle and dististyle. Ninth tergite, *t*, with conspicuous sublateral lobes provided with long setae, behind the concave central part darkened, provided with numerous shorter setae. Basistyle, *b*, long, the relatively small oval ventromesal lobe nearly basal in position, provided with very long yellow bristles that are arranged in two more or less distinct groups. Dististyle, *d*, very complex, as shown; the more massive body bears an extensive plate or cushion of spinoid setae, with a more yellowed lobe projecting beyond; rostral portion smaller, flattened, margin trilobed, basal lobe longer and more rounded; basal armature of style extensive and complex. Gonapophysis, *g*, with mesal-apical lobe relatively slender, blackened, tip acute. Aedeagus, *a*, slender, pale.

Holotype, male, Fond Figues River, Dominica, in rain forest, 3 February 1965 (Wirth).

This very distinct fly is dedicated to the collector, Dr. Willis W. Wirth, distinguished student of the Diptera. *Limonia (Caenoglochina) wirthiana* is entirely different from the other regional species presently known, *L. (C.) apicata* (Alexander) and races, in the long, strongly nodulose male antennae and in hypopygial structure, including the tergite, basistyle, and dististyle. Of the relatively numerous members of the subgenus elsewhere in Tropical America, *L. (C.) somnifica* Alexander, of Ecuador, has the antennal structure most nearly as in the present fly but with the details of hypopygial structure quite distinct.

Subgenus *Dicranomyia* Stephens

Key to Species of *Dicranomyia*

1. Wings unpatterned except for the more darkened stigma.....2
- Wings with a conspicuous reticulated brown pattern; male hypopygium (Figure 10), venation (Figure 7).....*L. (D.) clarkeana*, new species

2. Wings with cell 1st  $M_2$  closed; male hypopygium (Figure 11) with apex of rostral prolongation of ventral dististyle bidentate..... *L. (D.) divisa* Alexander  
 Wings with cell  $M_2$  open; male hypopygium with apex of rostral prolongation of ventral dististyle simple, short, and obtuse..... 3
3. General coloration of body and appendages yellow; wings with cell  $M_2$  open by atrophy of basal section of vein  $M_3$ , the medial fork above; vein  $Sc$  long,  $Sc_1$  ending about opposite one-third  $R_5$ , the latter about twice the basal deflection of  $R_{4+5}$ ; male hypopygium (Figure 9)..... *L. (D.) alfaroi* (Alexander)
- General coloration of body and appendages brown; wings with cell  $M_2$  open by atrophy of  $m$ , the medial fork below; vein  $Sc$  short,  $Sc_1$  ending before origin of  $R_5$ ; male hypopygium (Figure 12)..... *L. (D.) omissa* Alexander

*Limonia (Dicranomyia) alfaroi* (Alexander), 1922

FIGURE 9

*Dicranomyia alfaroi* Alexander; 1922, pp. 2-3.

The type was from San José, Costa Rica, collected in October 1920 by A. Alfaro. The species is widespread in continental tropical America from Mexico to Bolivia but had not been recorded from the Antilles.

The species is readily told by its small size, almost uniformly pale yellow color, long vein  $Sc$  and in having cell  $M_2$  of the wing open by the atrophy of the basal section of  $M_3$ . Male hypopygium (Figure 9) with the dorsal dististyle,  $d$ , bent near its outer end almost at a right angle into a long straight spine; ventral style slightly smaller than the basistyle, outer half of rostral prolongation pendant, the 2 slender rostral spines placed so close together as to appear as a single element.

DOMINICA.—Clarke Hall, at light trap, 1-10 March 1965 (Wirth). Fond Figues River, light trap, 13 March 1965 (Wirth). Freshwater Lake, 5-8 November 1966 (Gurney). D'leau Gommier, 15 February 1965 (Wirth). 804.7-2736 m (0.5 to 1.7 miles) east of Pont Casse, 27-29 January, 12 March 1965 (Wirth).

*Limonia (Dicranomyia) clarkeana*, new species

FIGURES 7, 10

Allied to *reticulata*; general coloration of thoracic notum brown, patterned with darker and light yellow, pleura longitudinally striped with brown; femora yellow with a broad subterminal dark brown ring; wings very pale yellow, costal border brighter, surface conspicuously patterned with brown, including series of darker costal spots and paler transverse lines in all cells; male hypopygium with ventral dististyle very large and fleshy, nearly four times the size of the basistyle, rostral spines 2, unusually small.

MALE.—Length about 4.5-5 mm; wing 5-5.5 mm; antenna about 0.8-0.9 mm.

FEMALE.—Length about 4.5-5 mm; wing 4.5-5.5 mm.

Rostrum dark brown; palpi brownish black. Antennae with scape brownish black, pedicel and 1st flagellar segment yellow, succeeding segments light brown, outer segments somewhat darker; proximal flagellar segments subglobular to short-oval, outer segments oval; verticils short. Anterior vertex broad, golden yellow, with a central dark brown line, posterior part of head brown.

Pronotum elongate, orange yellow above, darkened laterally. Mesonotal praescutum chiefly brown, patterned irregularly with darker, including a central area, posterior part with lateral and sublateral darkenings, with a light yellow line on either side of central darkening; scutal lobes gray, conspicuously variegated with brown, central area yellowed; scutellum light brown with a darkened spot on either side of the narrow midline, postnotum darkened, pleurotergite with silvery areas. Pleura chiefly yellowish gray, conspicuously patterned with darker brown, in cases with black; paler areas include chiefly the dorsal sternopleurite and metapleura; dorsopleural region brownish yellow, darkened anteriorly. Halteres with stem light yellow, knob abruptly dark brown to brownish black. Legs with coxae yellowish gray, with a brown central ring; trochanters yellow; femora yellow, clearer basally, with a broad dark brown nearly terminal ring, tip yellow, in cases very narrow; remainder of legs brown. Wings (Figure 7) very pale yellow with a conspicuous reticulated brown pattern that involves all cells; prearcular and costal fields light yellow, the latter with about 15

narrow brown spots, the interspaces more extensive; cells behind *R* with larger brown areas, including one at origin of *Rs* that crosses cells *R* and *M*; stigmal area largest, behind including the fork of *Rs*; other cells with markings narrowly transverse, crossing the cells, cell *M* with about 6 lines, 2nd *A* with 3 lines; veins light brown, costal interspaces yellow, alternating with the brown spots. Venation: *Sc* relatively short, *Sc*<sub>1</sub> ending about opposite origin of *Rs*, in cases to nearly one-third the length of this vein, *Sc*<sub>2</sub> near its tip; cell 1st *M*<sub>2</sub> longer than any of the veins beyond it, *m* transverse, much shorter than basal section of *M*<sub>2</sub>; *m-cu* long, shortly before fork of *M*.

Abdominal tergites and hypopygium brown, basal sternites obscure yellow, in cases the pattern includes brown areas on a more yellowed ground. Male hypopygium (Figure 10) with tergite, *t*, transverse, slightly narrowed outwardly, posterior border virtually truncate, the usual lobes scarcely developed. Basistyle, *b*, only about one fourth the size of the ventral dististyle; ventromesal lobe large, obtuse, with very long setae. Dorsal dististyle, *d*, a small gently curved sickle that narrows into a long spine; ventral style very large and fleshy; rostral prolongation straight, spines 2, unusually small, subequal, shorter than the prolongation beyond their origin, in cases the spines shorter and stouter, placed on prolongation, in other specimens closer to upper margin. Gonapophysis, *g*, with mesal-apical lobe narrowed into a gently curved acute point. Aedeagus terminating in a single small rounded lobe, the genital apertures sublateral.

Holotype, male, D'leau Gommier, 17 March 1956 (Clarke). Allotopotype, female. Paratopotypes, 4 males. Paratypes, males and females, Clarke Hall, 1–10, 21–28 February 1965 (Wirth). 1 female, 11 June 1966 (Steyskal). Male, Freshwater Lake, 5–8 November 1966 (Gurney); males and females, Pont Casse, 23 November 1964 (Spangler); 804.7–2,736 m (0.5 to 1.7 miles) east of Pont Casse, 1 January–24 March 1965 (Wirth), 804.7 m (0.5 mile) east, 11 April 1966 (Gagné), 4,828 m (3 miles) east, 13–16 October 1966 (Gurney). 804.7 m (0.5 mile) west of Pt. Lolo, at light, 25 January 1965 (Wirth). South Chiltern, 20 February 1965, in alcohol (Wirth), 2 November 1966 (Gurney).

Although it is generally similar to *Limonia* (*Dicranomyia*) *reticulata* (Alexander), of Mexico and the Greater Antilles (Jamaica, Cuba, Puerto Rico), and to certain other Neotropical species, the present fly

is readily told by the hypopygial structure, especially the enlarged ventral dististyle with unusually small rostral spines. Other species that have a somewhat similar wing pattern but distinct hypopygia include *L. (D.) calliergon* Alexander (Hispaniola), *L. (D.) forri* Alexander (Jamaica), *L. (D.) pampoecila* Alexander (Peru), *L. (D.) subreticulata* Alexander (Ecuador), and *L. (D.) thamyris* Alexander (Venezuela).

I take great pleasure in dedicating this attractive fly to the collectors, Dr. J. F. Gates Clarke and Mrs. Thelma Clarke.

### *Limonia* (*Dicranomyia*) *divisa* Alexander, 1929

#### FIGURE 11

*Dicranomyia diversa* Osten Sacken, 1859, p. 212; name preoccupied by *Limonia* (*Geranomyia*) *diversa* (Osten Sacken), 1859, p. 207.

*Limonia* (*Dicranomyia*) *divisa* Alexander, renaming of *diversa*, preoccupied, 1929a, p. 247.—1932, p. 359, fig. 8.—1942, p. 315, fig. 11.

Widely distributed in eastern North America; Greater Antilles (Jamaica, Hispaniola, Puerto Rico). Male hypopygium (Figure 11).

DOMINICA.—Clarke Hall, 11–20 January 1965, in Malaise trap (Wirth). D'leau Gommier, 16 March 1965 (Wirth). 2,736 m (1.7 miles) east of Pont Casse, 10–24 March 1965, light trap (Wirth).

The European *Limnobia divisa* Walker (1848, p. 55) never has been placed in the proper genus *Limonia* and so does not affect the present name. It now is recognized as being the correct name of *Erioptera* (*Erioptera*) *divisa*, formerly known as *E. (E.) macrophthalma* Loew. The use of the name *Erioptera* at this time and elsewhere in the present paper has been discussed by Stone et al. (1965, p. 80).

### *Limonia* (*Dicranomyia*) *omissa* (Alexander), 1912

#### FIGURE 12

*Furcomomyia omissa* Alexander, 1912a, p. 340, pl. 11, fig. o.

The types were from Aguna, Guatemala, collected by G. Eisen.

The venation has *Sc* relatively long, *Sc*<sub>1</sub> ending only a short distance before the origin of *Rs*; vein 2nd *A* short, the cell relatively narrow. Male hypopygium (Figure 12) with rostral prolongation of ventral dististyle very obtuse, apparently without terminal setae.

DOMINICA.—2,414 m (1.5 miles) north of Pont Casse, 12 February 1965 (Wirth). Trafalgar Falls, 365.7 m (1,200 ft), 5–6 April 1966 (Gagné).

### Subgenus *Neoglochina* Alexander

#### *Limonia* (*Neoglochina*) *insularis* (Williston), 1896

*Limnobia insularis* Williston, 1896, p. 287, pl. 10, fig. 58.

The unique type male was from Saint Vincent, collected at 304.8 m (1,000 ft) by H. H. Smith. The Dominican materials agree well with Williston's brief description and the identification is believed to be correct.

The general coloration of the thorax in the present specimens is brown rather than "brownish red" as stated by Williston. Wings strongly infumed throughout, more heavily so along costal border but not concentrated at apex. Wing tip in male obtuse, costa conspicuously thickened and with abundant short setae from blackened tubercles, the marginal ones larger and more evident to produce a roughened appearance. Male hypopygium with tergite transverse, posterior border very shallowly emarginate, not forming evident lobes; on either side some distance from border with 8 or 9 weak setae. Basistyle in area nearly twice the ventral dististyle, ventromesal lobe large, about one-half the size of the ventral style, with very long setae, those of body of style shorter. Dorsal dististyle a gently curved rod, tip acute; ventral style with long setae; rostral prolongation cleaver-like; glabrous except for 2 weak, nearly terminal setae; sensory pore elongate. Gonapophysis with mesal-apical lobe a small curved hook. Aedeagus with apex galeate, as in the subgenus.

DOMINICA.—A broken male, 3,218 m (2 miles) east of Pont Casse, 8 April 1966 (Gagné). A broken male, in alcohol, Fond Figues River, 13 March 1965 (Wirth).

### Subgenus *Neolimonia* Alexander

#### *Limonia* (*Neolimonia*) *gurneyi*, new species

FIGURE 13

General coloration of mesonotum light brown; anterior vertex conspicuously light gray, posterior vertex dark brown; knobs of halteres brownish black; legs brown; wings weakly tinted, with a restricted brown pattern, *Sc* long, ending nearly opposite three-fourths

*Rs*; abdominal tergites brownish black, proximal sternites bicolored, whitened, apices brown; male hypopygium with tergal setae few, about 8 on either side of midline; basistyle with ventromesal lobe shallowly divided at apex to form 2 lobules, one with the setae numerous and much longer than the other; ventral dististyle with body very small, rostral prolongation large, compressed-flattened, with 2 widely separated pale peglike spines, the outer lying in a longitudinal row of long yellow setae; gonapophysis with mesal-apical lobe erect, slender, blackened; apex of aedeagus a single small oval lobe.

MALE.—Length about 5.5–6.5 mm; wing 6–8.5 mm; antenna about 1.2–2 mm.

FEMALE.—Length about 5.5 mm; wing 6 mm.

Rostrum and palpi black. Antennae black; flagellar segments long-oval, with abrupt apical pedicels, each segment on outer face with a single very long verticil, the longest about two and one half times the segment, remaining verticils short and weak. Anterior vertex in front light gray, behind narrowed to a capillary strip; posterior vertex dark brown, sparsely pruinose.

Cervical region and pronotal scutum and pleura dark brown, scutellum and pretergites yellow. Mesonotal praescutum with 3 confluent shiny brown stripes, the central one paler, humeral region and lateral borders light yellow; posterior sclerites of notum uniformly light brown. Pleura dark brown, dorsopleural region and a broad ventral stripe yellowed, the latter including the fore and hind coxae, midcoxae and lower part of sternopleurite restrictedly darkened. Halteres with stem yellow, knob brownish black. Legs with coxae as described; trochanters yellow; femora brown, bases slightly more yellowed, tips narrowly darker brown, remainder of legs brown; claws of male long and slender, with 2 subbasal spines, the outer very long, basal spine small. Wings weakly tinted, prearcular and costal fields yellow; a restricted brown pattern that includes relatively small spots at arculus, origin of *Rs*, fork of *Sc*, and stigma; narrow seams over cord and outer end of cell *1st M*<sub>2</sub>; marginal clouds at ends of longitudinal veins, largest at *R*<sub>3</sub> and anals, very small on medial and cubital veins; a small isolated brown cloud in cell *R* at near one-third the length; veins brown, darker in the clouded parts. Venation: *Sc* long, *Sc*<sub>1</sub> ending about opposite three-fourths of *Rs*, *Sc*<sub>2</sub> near its tips; *Rs* nearly erect at origin, free tip of *Sc*<sub>2</sub> and *R*<sub>2</sub> in transverse alignment; *m-cu* close to fork of *M*; anal veins at origin virtually parallel.



Abdominal tergites brownish black; proximal 4 sternites bicolored, the bases broadly whitened, apices slightly more narrowly dark brown; outer segments and hypopygium uniformly dark brown. Male hypopygium (Figure 13) having the general structure of the subgenus. Ninth tergite, *t*, large, transverse, posterior border truncate on central third, shoulders more rounded; a group of 7 or 8 strong setae near outer margin, widely separated at midline. Basistyle, *b*, in area approximately twice the ventral dististyle, ventromesal lobe large, its apex shallowly divided into 2 lobules, the larger with numerous long setae, the other with few much smaller setae. Dorsal dististyle, *d*, long and slender, the slightly dilated apex curved, extended into a long point; ventral style with body unusually small, its area less than that of the beak, provided with long setae; beak very broad basally, with the usual 2 very long setae near base close to the dorsal style; 2 pale peglike rostral spines, the inner placed in an area of delicate setulae, outer spine removed, placed in a longitudinal row of long yellow setae. Gonapophysis, *g*, with mesal-apical lobe erect, slender, blackened. Aedeagus, *a*, with apex a single small oval lobe, the genital openings at its base.

Holotype, male, Manets Gutter, in light trap, 10 March 1965 (Wirth). Allotype, female, 804.7 m (0.5 mile) east of Pont Casse, 5 May 1966 (Gagné).

Paratypes, 2 males, with the allotype, 10–11 April 1966 (Gagné); 1 male, 27–30 November 1964 (Spangler).

The species is dedicated to Dr. Ashley B. Gurney, former student and longtime friend, distinguished authority on the Orthoptera, Grylloblattodea, Zoraptera, Corrodentia, and other groups. The paratype males are considerably larger than the holotype, with more heavily patterned wings and with slight differences in the male hypopygium but appear to pertain to this species. The allotype more closely resembles the holotype. The subgenus *Neolimonia* includes rather numerous regional species, including one each from the major Greater Antilles, *Limonia* (*Neolimonia*) *borinquensis* Alexander (Puerto Rico), *L. (N.) caribaea* Alexander (Cuba), *L. (N.) domballah* Alexander (Hispaniola), and *L. (N.) jamaicensis* Alexander (Jamaica). Other species are found in the southern United States, Mexico, and Central America, including the Nearctic *L. (N.) argenteiceps* (Alexander) and *L. (N.) rara* (Osten Sacken). There are numerous other species in Central and South America, all most readily separated among themselves and from the present fly by details of coloration and venation and especially by hypopygial features. It may be noted that a single species, *L. (N.) dumetorum* (Meigen), occurs in Europe.

### Subgenus *Geranomyia* Haliday

#### Key to Species of *Geranomyia*

1. Wings unpatterned except for the more darkened stigma..... 2  
Wings with a darkened pattern other than the stigma..... 7
2. Wings with vein *Sc* short, *Sc*<sub>1</sub> ending opposite or close to origin of *Rs*..... 3  
Wings with vein *Sc* longer, *Sc*<sub>1</sub> ending opposite one-fourth to one-half the length of *Rs*..... 5
3. General coloration of thorax gray, praescutum with a darkened central strip; male hypopygium (Figure 15) with 2 slightly separated rostral spines.  
*L. (G.) cinereinota* (Alexander)..... 4
4. Praescutal stripes clearly defined, especially the narrow central vitta; legs with tips of fore tibiae conspicuously black; male hypopygium (Figure 24) with rostral spines very long, more than twice the rostral prolongation; mesal-apical lobe of gonapophysis bidentate at tip..... *L. (G.) tibialis* (Loew)
- Praescutal stripes pale brown, poorly defined; legs uniformly brown, tibiae not blackened; male hypopygium (Figure 19) with rostral spines shorter than the rostrum itself; mesal-apical lobe of gonapophysis flattened, tip simple..... *L. (G.) neptis*, new species
5. Male hypopygium (Figure 21) with rostrum of ventral dististyle bearing 2 very unequal spines, the longest from a conspicuous basal tubercle, apex of rostrum very short and obtuse..... *L. (G.) spangleri*, new species
- Male hypopygium with rostral spines of ventral dististyle short and nearly equal in length. . 6
6. Wings tinged with brown, the stigma conspicuously darker brown, vein *Sc* shorter, *Sc*<sub>1</sub> ending about opposite one-third *Rs*; body and appendages brown; male hypopygium

- (Figure 18) with spines of the elongate rostral prolongation basal in position; gonapophysis with mesal-apical lobe darkened, triangular in outline, about as long as the diameter across base ..... *L. (G.) microphaea* Alexander
- Wings subhyaline, the stigma pale brown, vein  $Sc_1$  ending nearly opposite midlength of  $R_s$ ; body and appendages brown, in fresh specimens with greenish tints; male hypopygium (Figure 22) with rostral spines closely approximated, arising from summit of a low tubercle; gonapophysis with mesal-apical lobe pale, elongate  
*L. (G.) subvirescens* Alexander
7. Wings with vein  $Sc$  long,  $Sc_1$  ending beyond midlength of  $R_s$ , darkened areas at origin of  $R_s$  and tip of  $Sc$  small, widely separated; legs with a very narrow darkened subterminal femoral ring, the yellow apex about three times as extensive  
*L. (G.) bicincta angusticincta* Alexander
- Wings with vein  $Sc$  shorter,  $Sc_1$  ending opposite origin of  $R_s$  or shortly beyond, in cases to about one-third the length, the darkened areas at origin of  $R_s$  and at tip of  $Sc$  confluent ..... 8
8. Mesonotal praescutum with a broad median brown or orange stripe that is narrowly margined laterally with darker ..... 9
- Mesonotal praescutum with 3 or 5 narrow brown discal stripes ..... 10
9. Legs with femora brown, tips yellow; male hypopygium (Figure 17) with 2 separated rostral spines from long tubercles, the spines divaricate; apical lobes of aedeagus of moderate size ..... *L. (G.) eurygramma* (Alexander)
- Legs with femora yellowed, with a narrow brown subterminal ring; male hypopygium (Figure 16) with 2 very long rostral spines arising from summit of an elongate basal tubercle, the latter subequal in size to the entire rostrum; apex of aedeagus with 2 very large lobes ..... *L. (G.) dominicana* Alexander
10. Costal border of wing light yellow, the darkened pattern greatly reduced to narrow seams over cord and elsewhere; male hypopygium (Figure 14) with rostral spines subequal, from small slightly separated tubercles ..... *L. (G.) caribica*, new species
- Costal border of wing less evidently yellowed, variegated by conspicuous brown areas at the supernumerary crossvein in cell  $Sc$ , origin of  $R_s$ , and at tip of  $Sc$ , and the stigma; male hypopygium with the rostral spines at summits of conspicuous tubercles ..... 11
11. Wings with  $Sc$  short,  $Sc_1$  ending just beyond origin of  $R_s$ ; male hypopygium (Figure 20) with rostral spines from stout basal tubercles, very unequal in size, the small inner one very slender, hairlike ..... *L. (G.) recondita civica* Alexander
- Wings with  $Sc$  longer,  $Sc_1$  ending opposite one-fifth to one-third  $R_s$ ; male hypopygium with rostral spines subequal, from long basal tubercles ..... 12
12. Darkened wing pattern heavier, especially along  $Sc$  and the cord; dark femoral ring broad, much exceeding the yellow tip; male hypopygium with rostral spines subequal to or only slightly exceeding their long basal tubercles; gonapophysis with mesal-apical lobe long and slender, narrowed outwardly; 9th tergite with central emargination broad  
*L. (G.) plumbeipleura* (Alexander)
- Darkened wing pattern paler and less extensive; dark femoral ring narrow, pale, only slightly longer than the yellow tip; male hypopygium (Figure 23) with the rostral spines subequal, about twice as long as their relatively small basal tubercles; gonapophysis with mesal-apical lobe a small darkened spine; 9th tergite with central emargination narrower, shallow ..... *L. (G.) sylvania* Alexander

*Limonia (Geranomyia) bicincta angusticincta* (Alexander), 1921

*Geranomyia bicincta angusticincta* Alexander, 1921, p. 45.

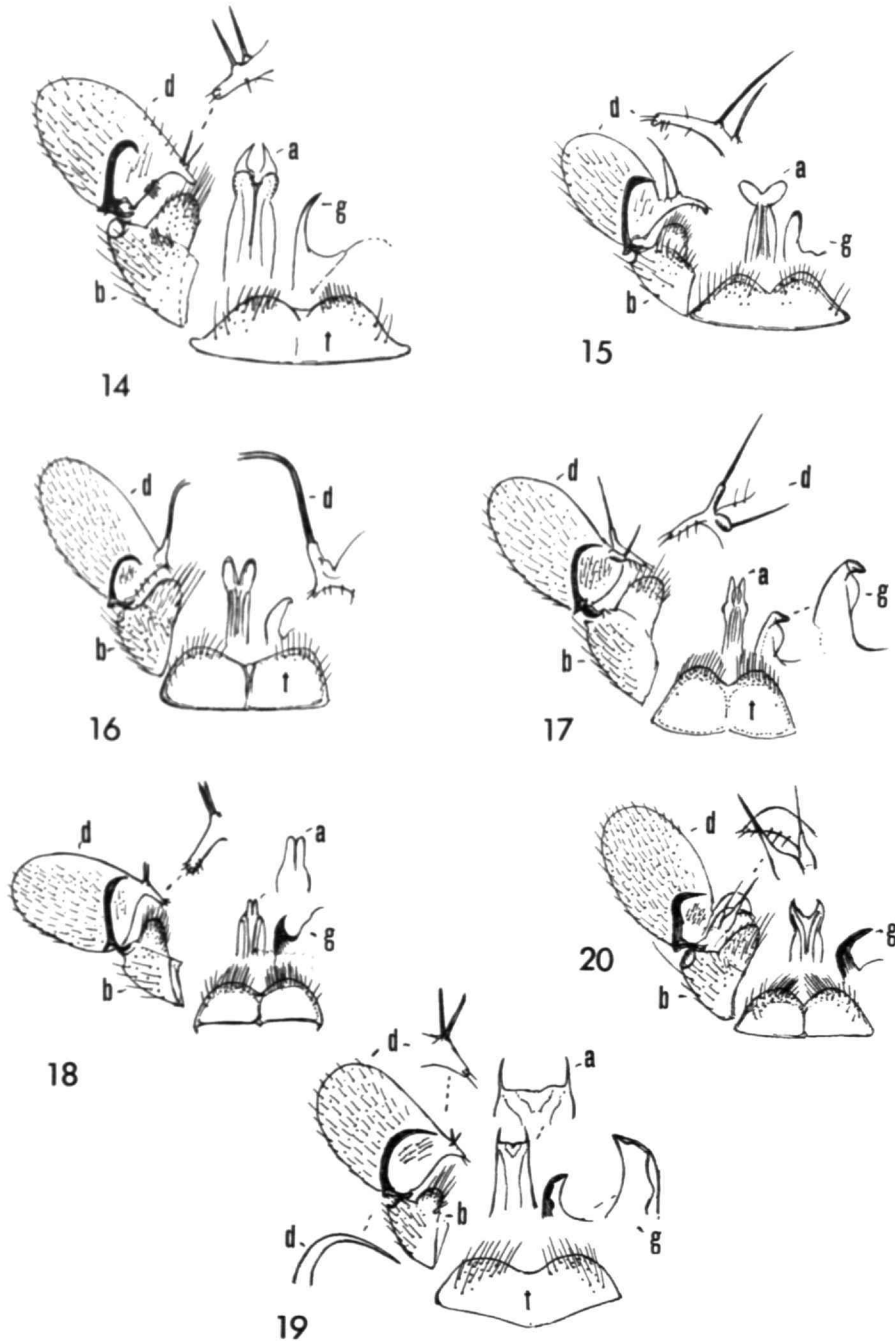
The types were from Amazonian Peru, collected by H. S. Parish. Although only the female sex is available from Dominica the identification appears to be correct.

DOMINICA.—Clarke Hall, 11–20 January 1965, 21–28 February 1965, in light trap (Wirth); Sylvania, 23 January 1965 (Wirth).

*Limonia (Geranomyia) caribica*, new species

FIGURE 14

Mesonotal praescutum yellowed, with 5 brown stripes, the intermediate 3 narrow, central stripe darker, posterior sclerites of notum and the pleura yellowed; legs yellow, femora with a pale brown subterminal ring; wings tinted with pale brown, costal border clear light yellow, disk with a very restricted brown pattern over the veins, including the cord, stigma small and faintly



FIGURES 14-20.—Male hypopygium: 14, *Limonia (Geranomyia) caribica*, new species 15, *Limonia (Geranomyia) cinereinota* (Alexander); 16, *Limonia (Geranomyia) dominicana* Alexander; 17, *Limonia (Geranomyia) eurygramma* (Alexander); 18, *Limonia (Geranomyia) microphaea* (Alexander); 19, *Limonia (Geranomyia) neptis*, new species; 20, *Limonia (Geranomyia) recondita civica* Alexander. [SYMBOLS: a, aedeagus; b, basistyle; d, dististyle; g, gonapophysis; t, tergite.]

indicated, vein  $Sc_1$  ending about opposite one fourth to one third  $Rs$ ; male hypopygium with rostral prolongation slender, with 2 straight spines from small basal tubercles; gonapophysis with mesal-apical lobe pale, long and slender.

MALE.—Length, excluding rostrum, about 5–6 mm; wing 6–7.5 mm; rostrum about 2.4–2.7 mm.

FEMALE.—Length, excluding rostrum, about 5.5–7.5 mm; wing 6.5–7.5 mm; rostrum about 2.8–3 mm.

Rostrum relatively long, more than twice the length of the antennae, dark brown, tips of labial palpi paler. Antennae dark brown, pedicel slightly paler. Head gray, vestiture blackened.

Pronotum yellowed, narrowly dark brown medially, sides paler brown. Mesonotal praescutum with ground yellowed, with 5 brown stripes, those on the disk narrower, central line dark brown, intermediate pair slightly broader, paler brown, lateral darkenings still broader; scutum yellowed, inner part of each lobe brown, being a posterior extension of the intermediate praescutal stripe; posterior sclerites of notum and the pleura yellowed. Halteres with stem yellow, knob very slightly darker. Legs with coxae and trochanters light yellow; remainder of legs yellow, femora with a more or less distinct pale brown subterminal ring. Wings tinted with pale brown, costal border, including both cells  $C$  and  $Sc$ , clear light yellow; very small and inconspicuous brown spots and seams at  $Sc_2$ , origin of  $R_s$ , cord, and outer end of cell  $1st M_2$ ; stigmal darkening very faintly indicated; veins pale brown, more yellowed in costal field. Venation:  $Sc$  relatively long,  $Sc_1$  ending about opposite one-fourth to one-third  $Rs$ ,  $Sc_2$  lacking, supernumerary crossvein in cell  $Sc$  far retracted,  $Sc_1$  alone about one-half longer than  $Rs$ ;  $m-cu$  at or close to fork of  $M$ .

Abdominal tergites brown to light brown, sternites paler. Male hypopygium (Figure 14) with tergite,  $t$ , transverse, posterior lobes small and low. Basistyle,  $b$ , less than one-half the size of the ventral dististyle; ventromesal lobe simple. Dorsal dististyle,  $d$ , slightly dilated on outer half, thence narrowed and decurved to a sharp point; ventral style with rostral prolongation slender, the 2 subequal spines contiguous, from small basal tubercles; mesal margin of style below base of prolongation with a group of black setae. Gonapophysis,  $g$ , with mesal-apical lobe pale, long and slender, narrowed gradually to the acute tip. Aedeagus relatively broad, the rounded terminal lobes further extended into membranous triangular points.

Holotype, male, Trafalgar Falls, Dominica, 365.7 m (1,200 ft), 5–6 April 1966 (Gagné). Allotopotype, female. Paratopotypes, 4 males and females. Paratypes, 1 female, Antrim, 304.8 m (1,000 ft) 11 March 1956 (Clarke); Fond Figes River, in light trap, 13 March 1965 (Wirth); 1 female, Manets Gutter, light trap, 10 March 1965 (Wirth).

In the general coloration of the thorax and wings, the present fly suggests species such as *Limonia* (*Geranomyia*) *tibialis* (Loew) and some others but is entirely distinct, especially in the hypopygial characters. The characteristic wing pattern separates it from other regional species.

### *Limonia* (*Geranomyia*) *cinereinota* (Alexander), 1913

#### FIGURE 15

*Geranomyia cinereinota* Alexander, 1913b, pp. 407–408, pl. 14, fig. 4.

*Limonia* (*Geranomyia*) *cinereinota* Alexander, 1939b, p. 94.  
*Limonia* (*Geranomyia*) *cinereinota* Alexander, 1953, pp. 89–90, fig. 4.

*Geranomyia domingensis* Alexander, 1916a, pp. 490–491.

The type of *cinereinota* (male) was from Coroico, Bolivia; type of *domingensis* (female) from the San Francisco Mountains, Santo Domingo (Hispaniola).

The species is widespread in Tropical America, from Puerto Rico and Hispaniola in the Greater Antilles, south to Paraguay. Male hypopygium (Figure 15) with the area of the ventral dististyle,  $d$ , less than twice that of the basistyle,  $b$ ; rostral prolongation long and slender, the 2 unequal spines from small basal tubercles, outer spine longer. Apical lobes of aedeagus,  $a$ , relatively broad, tips obtuse.

DOMINICA.—Clarke Hall, 15 January 1965 (Clarke); 21 January–10 February 1965 (Wirth), 18 January 1966 (Wirth); 6–8 October 1966 (Gurney). Fond Figes River, at light trap in rain forest, 25–30 January, 3–9 February, 13 March 1965 (Wirth), altitude 121.9 m (400 ft), 29 April 1966 (Gagné). D'leau Gommier, 16 March 1965 (Wirth), 518 m (1,700 ft), Central Forest Reservation, 26 May 1966 (Gagné). Layou River, on Hatton Garden Trail, 609.6 m (2,000 ft), 16 August 1938 (Hodge). 2,414 m (1.5 miles) north of Pont Casse, 19 February 1965 (Wirth). 2,736 m (1.7 miles) east, 24 March 1965 (Wirth), 321.8 m (0.2 mile) east, 6 May 1966 (Gagné), Pont Casse, 14 October 1966 (Gurney).

Along trail 1,609 m (1 mile) north of junction of roads to Rosalie and Castle Bruce, 396 m (1,300 ft), April 23, 1966 (Gagné). Springfield, November 1967 (Krauss).

*Limonia (Geranomyia) dominicana* Alexander, 1939

FIGURE 16

*Limonia (Geranomyia) dominicana* Alexander, 1939b, pp 94-95.

The type was from Dominica, as recorded below.

Male hypopygium (Figure 16) with the tergite, *t*, transverse, posterior border with very low lobes. Basistyle, *b*, only about one-fourth the size of the ventral dististyle, ventromesal lobe oval. Dorsal dististyle, *d*, a slender gently curved rod, the acute tip decurved; ventral style very large, fleshy; rostral prolongation very small, the 2 spines very long and slender, placed together at summit of a long basal tubercle that exceeds the prolongation beyond it, the spines curved gently. Gonapophysis, *g*, with mesal-apical lobe flat, darkened, the apex a microscopic knob. Aedeagus terminating in 2 large oval lobes.

DOMINICA.—Type from the Sylvania Estate, 548.6 m (1,800 ft), 30 August 1938 (Hodge); Freshwater Lake, 5-8 November 1966 (Gurney); 4,828 m (3 miles) east of Pont Casse, 13-16 October 1966 (Gurney).

*Limonia (Geranomyia) eurygramma* (Alexander), 1928

FIGURE 17

*Geranomyia eurygramma* Alexander, 1928a, pp. 107-108.

Types from Cordobá, Mexico. The present materials differ in some respects from the type. Central praescutal stripe light brown, separated by broad darker brown lateral borders, pleural stripe similarly darkened; scutellum and central area of scutum whitened. Legs with femora yellowish brown, clearer yellow basally, tips yellow. Certain of the specimens are smaller and show slight differences in coloration, the praescutum yellow with a central median brown stripe, the centers of the scutal lobes darkened, and the pleura yellow without pattern. The wing pattern and hypopygial structure, however, are so similar to typical material that the identification is considered to be correct. Male hypopygium (Figure 17) with the basistyle, *b*, about one-third to one-half the large fleshy ventral dististyle,

*d*; rostral prolongation of the latter slender, the 2 spines from conspicuous basal tubercles, that of the longer outer spine subequal in size to the prolongation beyond it. Gonapophysis, *g*, with concave margin of apical lobe with a conspicuous flange. Aedeagus terminating in 2 long pale lobes, tips obtuse, not extended into a point as in many other species.

DOMINICA.—Fond Figues River, 121.9 m (400 ft), in light trap, 13 March 1965 (Wirth); 29 April 1966 (Gagné). D'leau Gommier, 17 March 1956 (Clarke). 1,609 m (1 mile) east of Pont Casse, 29 January 1965 (Wirth). 2,736 m (1.7 miles) east, light trap, 12 March 1965 (Wirth).

*Limonia (Geranomyia) neptis*, new species

FIGURE 19

Size small (wing to 5 mm); general coloration of thoracic notum brownish yellow, patterned with pale brown, including 3 praescutal stripes, pleura clearer yellow; rostrum black, approximately one-half the remainder of body; antennae and knob of halteres black; legs medium brown; wings weakly tinted, unpatterned except for the small pale brown stigma, vein *Sc* short, *Sc*<sub>1</sub> ending opposite origin of *Rs*, *Sc*<sub>2</sub> shortly removed; abdominal tergites dark brown, sternites yellowed; male hypopygium with the dorsal dististyle extended into a long straight spine, ventral style with rostral prolongation small, the 2 spines pale, from a common low rounded tubercle; gonapophysis with mesal-apical lobe flattened, inner margin conspicuously emarginate to form 3 unequal lobes; aedeagus broad, terminating in 2 acute pale spines, without setulae on margin before apex.

MALE.—Length, excluding rostrum, about 4.2-4.5 mm; wing 4-5 mm; rostrum about 1.8-2.5 mm.

FEMALE.—Length, excluding rostrum, about 4 mm; wing 5 mm; rostrum about 2.4 mm.

Rostrum black, approximately one-half the remainder of body. Antennae black, less than one-half the rostrum; flagellar segments oval, crowded, verticils short. Head behind brownish gray, front more silvery, anterior vertex about equal in width to the antennal scape.

Pronotum brownish yellow. Mesonotal praescutum brownish yellow with 3 pale brown stripes that are poorly indicated against the ground; scutal lobes and scutellum darker yellowish brown, remainder of notum brownish yellow. Pleura clearer yellow, more so on ventral half. Halteres with stem brown, paler at base,

knob black. Legs with coxae and trochanters yellow; remainder of legs medium brown, femoral bases narrowly more yellowed; claws relatively long, the slender spines grouped at base. Wings weakly tinted, prearcular field yellow; stigma small, pale brown; veins darker brown. Macrotrichia on longitudinal veins beyond general level of cord, including also  $R_5$  and outer end of  $M$ , lacking on  $Cu$  and the anals. Venation:  $Sc$  short,  $Sc_1$  ending opposite origin of  $R_5$ ,  $Sc_2$  shortly removed;  $M_{3+4}$  subequal in length to vein  $M_4$ ;  $m-cu$  subequal to distal section of  $Cu_1$ , shortly before fork of  $M$ ; vein 2nd  $A$  relatively short, nearly straight to gently convex.

Abdominal tergites dark brown, sternites slightly paler, yellowed in the female. Male hypopygium (Figure 19) with tergite,  $t$ , transverse, posterior border with 2 low rounded lobes provided with numerous setae. Basistyle,  $b$ , about one-third the area of the ventral dististyle; ventromesal lobe relatively small, oval, with very long setae, some exceeding the lobe in length. Dorsal dististyle,  $d$ , a curved sickle, apical fourth a long straight spine; ventral style with rostral prolongation small, the 2 spines short and straight from a common low rounded tubercle. Gonapophysis,  $g$ , with mesal-apical lobe conspicuously flattened, darkened, inner edge emarginate to form 3 unequal lobes. Aedeagus broad, outer apical angles produced into acute pale spines, lateral margins before the spine without setulae, such as are found in *microphaea*.

Holotype, male, 321.8 m (0.2 mile) east of Pont Casse, 10 April 1966 (Gagné). Allotopotype, female, 1,609 m (1 mile) east of Pont Casse, at light, 29 January 1965 (Wirth). Paratopotypes, male, 2,414 m (1.5 miles) west of Pont Casse, at light, 27 January 1965 (Wirth); males and females, Pont Casse, 8–16 October 1966 (Gurney). Paratypes, 2 males, 1 female, Freshwater Lake, 5–8 November 1966 (Gurney); 804.7 m (0.5 mile) west of Pt. Lolo, at light, 25 January 1965 (Wirth).

The most similar regional species is *Limonia (Geranomyia) microphaea* Alexander, likewise described from Dominica, as considered earlier. Both are small brown species with the wings unpatterned or virtually so. The two flies differ from one another in the length of vein  $Sc$  and very evidently in hypopygial structure, especially both dististyles, gonapophyses, and the apex of the aedeagus, as described and figured for both species.

*Limonia (Geranomyia) plumbeipleura* (Alexander), 1916

*Geranomyia plumbeipleura* Alexander, 1916c, pp. 10–11, pl. 2, fig. 4.

*Limonia (Geranomyia) plumbeipleura* Alexander, 1939b, p. 94.

Type from Huigra, Ecuador. Widely distributed in tropical America from Dominica, Trinidad, and Panama, southward to Brazil and Peru.

DOMINICA.—Antrim, 304.8 m (1,000 ft), 11–12 March 1956 (Clarke). Clarke Hall, light trap, 21–28 February, 1–10 March 1965 (Wirth), 27 May 1966 (Steyskal). 4,828 m (3 miles) east of Pont Casse, 13–16, 28–30 October 1966 (Gurney). Roseau, at light, 28 December 1964, 3 January 1965 (R. T. Bell). Sylvania Estate, 548.6 m (1,800 ft), 28–30 August 1938 (Hodge).

*Limonia (Geranomyia) recondita civica* Alexander, 1939

FIGURE 20

*Limonia (Geranomyia) recondita civica* Alexander, 1939a, pp. 70–71.

*Geranomyia recondita* Alexander, 1921, pp. 42–43.

Type of *Limonia (Geranomyia) recondita* from Iquitos, Amazonian Peru, May 1920. Type of *L. (G.) civica* from Vergel, Chiapas, Mexico, 800 meters (about 0.5 mile), June 1935.

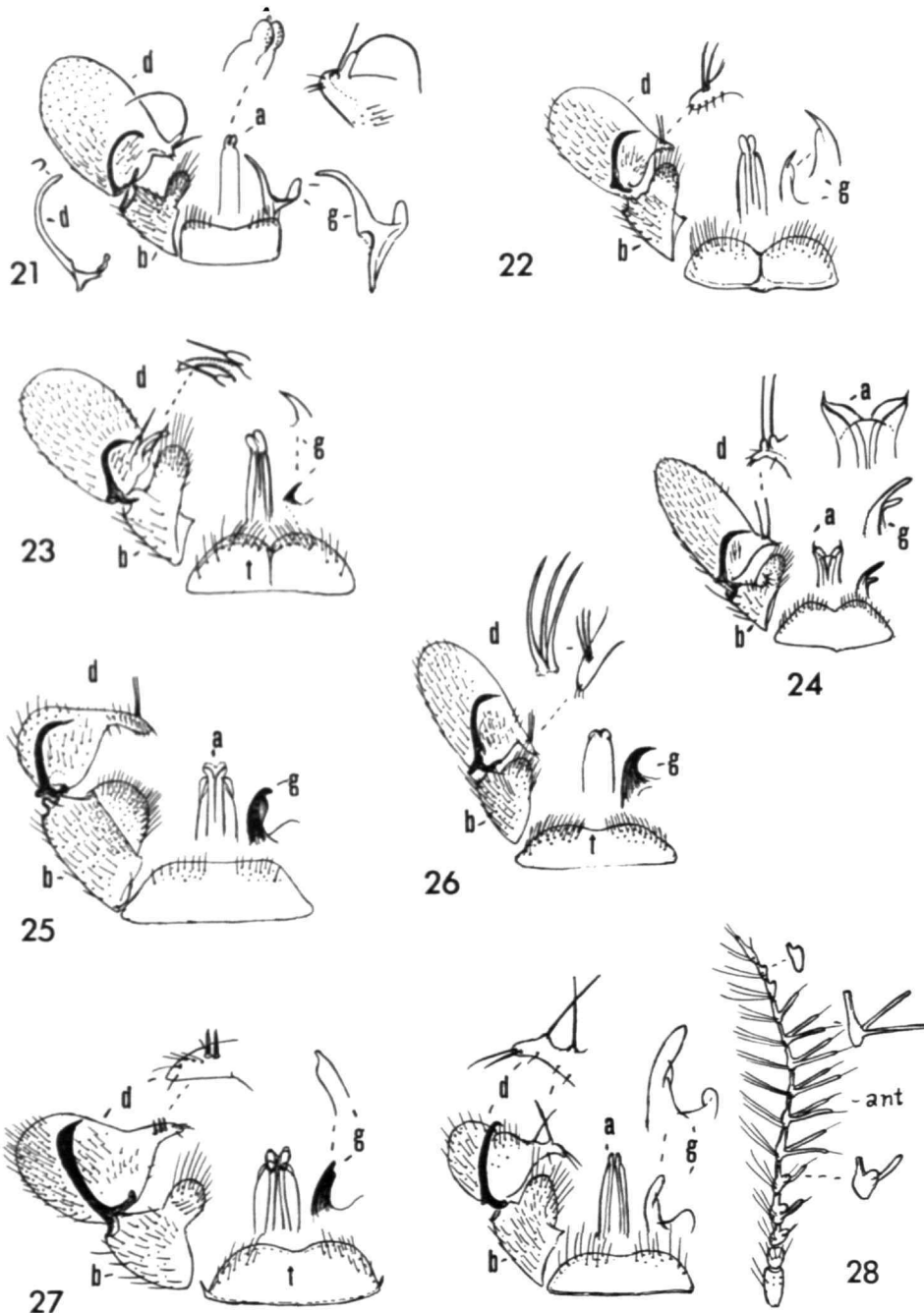
Typical *recondita* generally is more southern but has been recorded from Puerto Rico. The present race is known also from Jamaica. It has vein  $Sc$  short, with  $Sc_1$  ending opposite the origin of  $R_5$  and with the femora darkened, with only the apex yellowed. In the male specimen from Pont Casse, recorded below, the legs are uniformly blackened, with no indication of pale femoral tips.

DOMINICA.—Fond Figues River, in rain forest, 1 February 1965 (Wirth). 4,828 m (3 miles) east of Pont Casse, 13–16 October 1966 (Gagné).

*Limonia (Geranomyia) spangleri*, new species

FIGURE 21

Size small (wing of male 4.5 mm); rostrum about one-half the wing; thorax above brownish yellow, pleura clearer yellow; legs light brown; wings very weakly



FIGURES 21-28.—Male hypopygium: 21, *Limonia (Geranomyia) spangleri*, new species; 22, *Limonia (Geranomyia) subvirescens* Alexander; 23, *Limonia (Geranomyia) sylvania* Alexander; 24, *Limonia (Geranomyia) tibialis* (Loew); 25, *Limonia (Rhipidia) bipectinata* (Williston); 26, *Limonia (Rhipidia) eremnocera*, new species; 27, *Limonia (Rhipidia) tetraleuca* Alexander. Antenna: 28, *Limonia (Rhipidia) willistoniana* Alexander. [SYMBOLS: a, aedeagus; ant, antenna of male; b, basistyle; d, dististyle; g, gonapophysis; t, tergite.]

tinted, stigma subcircular, pale brown,  $Sc_1$  ending nearly opposite midlength of  $R_s$ ; male hypopygium with the ventral dististyle large and fleshy, more than four times the basistyle; rostral prolongation very short and obtuse, the 2 spines unequal, the outer shorter from a very small basal tubercle, inner spine long and slender from a longer pale basal tubercle; dorsal dististyle with tip obtuse; gonapophysis with mesal-apical lobe pale, narrow.

MALE.—Length, excluding rostrum, about 4 mm; wing 4.5 mm; rostrum about 2.2 mm.

FEMALE.—Length, excluding rostrum, about 4 mm; wing 4.2 mm; rostrum about 2.1 mm.

Rostrum in both sexes approximately one-half the remainder of body, medium brown. Antennae with scape yellowish brown, remainder dark brown; flagellar segments suboval, verticils very small. Head medium brown; eyes large, anterior vertex reduced to a narrow strip.

Thoracic dorsum almost uniformly brownish yellow, scutellum somewhat clearer yellow; pleura yellowed, clearer ventrally. Halteres with stem yellow, knob dark brown. Legs with coxae and trochanters yellowed, faintly tinted with green; remainder of legs light brown. Wings very faintly tinted, stigma pale brown, subcircular; veins light brown. Longitudinal veins beyond origin of  $R_s$  with macrotrichia, including also the outer fifth of  $M$ , lacking on  $Cu$  and the anal. Venation:  $Sc$  relatively long,  $Sc_1$  ending nearly opposite midlength of the straight  $R_s$ ,  $Sc_2$  close to its tip;  $m-cu$  some distance before fork of  $M$ .

Abdominal tergites medium brown, sternites light yellow. Ovipositor with cerci slender, nearly straight. Male hypopygium (Figure 21) with the tergite,  $t$ , transverse, posterior border very shallowly emarginate, the low lobes with long coarse setae. Basistyle,  $b$ , small, ventromesal lobe long-oval. Dorsal dististyle,  $d$ , a gently curved rod, tip obtuse; ventral style large and fleshy, its area more than four times that of the basistyle, setae small; rostral prolongation distinctive, very short and obtuse, the 2 spines very unequal, the outer close to apex of prolongation, straight, from a very small basal tubercle, 2nd spine from a long pale basal tubercle, long and slender, strongly curved into a sickle that narrows very gradually to an acute point, the sickle a little shorter than the dorsal dististyle and much more slender. Gonapophysis,  $g$ , with mesal-apical lobe pale, narrow, shaped as figured; aedeagus narrow, terminating in 2 very small lobes.

Holotype, male, Fond Figues River, 1 December 1964 (Spangler). Allotopotype, female, with the type. Both types emerged from pupae, the cases being preserved with the adults; cast skins attached to small pieces of a species of moss.

I dedicate this species to the collector, Dr. Paul J. Spangler, coleopterist with the United States National Museum, who collected several interesting Tipulidae in Dominica.

Other regional species that are generally similar to the present fly include *Limonia (Geranomyia) militaris* Alexander (*L. (G.) viridula* Alexander, preoccupied), *L. (G.) subvirescens* Alexander, *L. (G.) virescens* (Loew), and *L. (G.) viridella* Alexander. The most nearly allied are *L. (G.) militaris* and *L. (G.) virescens* which differ evidently in hypopygial structure, especially both dististyles and the gonapophyses. In the present fly particular attention is called to the outer dististyle and to the rostral prolongation of the ventral style and its armature.

#### *Limonia (Geranomyia) subvirescens* Alexander, 1930

FIGURE 22

*Limonia (Geranomyia) subvirescens* Alexander, 1930, p. 112.

The types were from the Trinidad Mountains, Cuba. Other materials that appear to be strictly conspecific are from Panama and Venezuela. The subspecies, *jamaicae* Alexander, still is known only from Jamaica, differing from the present fly in slight details of hypopygial structure.

DOMINICA.—Clarke Hall, 21–31 January, 1–28 February, 11–31 March 1965, chiefly in light traps and Malaise trap (Wirth); 10 October 1966 (Gurney); along Cocoa Trail, 16 February 1965 (Wirth). Pont Casse, 27–30 November 1964 (Spangler), 2,414 m (1.5 miles) north, 12 February 1965 (Wirth), 4,828 m (3 miles) east, 13–16 October 1966 (Gurney).

#### *Limonia (Geranomyia) sylvania* Alexander, 1939

FIGURE 23

*Limonia (Geranomyia) sylvania* Alexander, 1939b, pp. 97–98, fig. 16.

Types from Sylvania, as recorded below. Male hypopygium (Figure 23).

The nearest relative is *Limonia (Geranomyia) marthae* Alexander, known from Colombia and Vene-



zuela, south to Bolivia. This differs in slight hypopygial characters, as the larger ventral dististyle and very unequal basal tubercles of the rostral spines of the style.

DOMINICA.—Sylvania Estate, 548.6 m (1,800 ft), 28 August 1938 (Hodge), type. 804.7 m (0.5 mile) east of Pont Casse, at light, 27 January 1965 (Wirth).

*Limonia (Geranomyia) tibialis* (Loew), 1851

FIGURE 24

*Aporosa tibialis* Loew, 1851, pp. 397–398.

*Limonia (Geranomyia) tibialis*.—Alexander, 1954, pp. 60–61, fig. 27.

*Limonia (Geranomyia) tibialis*.—Alexander, 1962, p. 3, figs. 3, 4.

One of the most widely distributed species in the subgenus, ranging from the Antilles (Jamaica, Puerto Rico, Dominica, Grenada) and Mexico, to southern

Brazil, Paraguay, Bolivia, and Argentina; Galapagos.

Male hypopygium (Figure 24) with rostral prolongation of ventral dististyle, *d*, very small, especially the apex which is much shorter than the 2 long straight spines, these from small basal tubercles. Gonapophysis, *g*, bidentate at apex. Aedeagus broad, the pale apical blades extended into a hairlike point.

DOMINICA.—Clarke Hall, 26–31 October 1964 (Spangler), 11 January–31 March 1965, in light traps (Wirth), 10–31 October 1966 (Gurney). D'leau Gommier, Central Forest Preserve, 13 May 1966 (Steyskal), 26 May 1966 (Gagné). Layou River, at mouth, 15 January 1965 (Wirth). Melville Hall Airport, 28 May 1964 (Steyskal). Pont Casse, 23 November 1964 (Spangler), 8–13 October 1966 (Gurney). Roseau, October–November 1967 (Krauss). Springfield, November 1967 (Krauss). Sylvania Estate, 548.6 m (1,800 ft), 30 August 1938 (Hodge), 25 October 1966 (Gurney).

Genus *Rhipidia* Meigen

Key to Species of *Rhipidia* (based on male sex)

1. Antennae of male with flagellar segments bipectinate or weakly tripectinate..... 2  
    Antennae of male with flagellar segments unipectinate to subpectinate..... 3
2. Wings infuscated, without clearly defined darker areas excepting the stigma, vein *Sc* long, *Sc*<sub>1</sub> ending nearly opposite the fork of *Rs*; antennae with 10 branched segments, bipectinate, with a rudimentary spur distad of the primary branches to appear weakly tripectinate, terminal segment simple, pale; male hypopygium (Figure 25) with spines of rostral prolongation of ventral dististyle contiguous at their bases... *L. (R.) bipectinata* (Williston)  
    Wings cream colored, with a conspicuous dark pattern, including 4 major brown areas in costal field, vein *Sc* shorter, *Sc*<sub>1</sub> ending about opposite midlength of *Rs*; antennae (Figure 28) with 6 bipectinate segments, without an additional basal spur, outer 3 segments subpectinate to simple, terminal segment dark; male hypopygium (Figure 28) with spines of rostral prolongation of ventral dististyle widely separated  
        *L. (R.) willistoniana* Alexander (*costalis* Williston, preoccupied)
3. Antennal flagellar segments uniformly blackened..... 4  
    Antennal flagellum with certain outer segments pale..... 5
4. Wings with darkened pattern restricted, the subcostal markings smaller than the ground interspaces, cell 2nd *A* unicolorous; legs with all tarsi darkened; antennae with flagellum subpectinate, the longest productions subequal to the segments; male hypopygium (Figure 26) with 3 long pale rostral spines..... *L. (R.) eremnocera*, new species  
    Wings with darkened pattern more extensive, the subcostal markings much exceeding the interspaces, cell 2nd *A* dark, its base broadly whitened; legs with posterior tarsi extensively yellowed; antennae with flagellum unipectinate, longest branches about twice the segments; male hypopygium with 2 short inconspicuous rostral spines... *L. (R.) subcostalis* (Alexander)
5. Antennal flagellum with 2 subterminal segments (12 and 13) pale..... 6  
    Antennal flagellum with more numerous pale segments..... 7
6. Wings with darkened pattern more extensive, especially in the costal field, in the stigmal region forming a pale brown ring; mesonotal praescutum brownish gray, patterned with

- darker brown, lateral margins not paler, pleura brownish gray without a clearly defined darker stripe; male hypopygium with ventral dististyle large, about twice the basistyle, rostrum with 2 or 3 spines..... *L. (R.) domestica* (Osten Sacken)
- Wings with darkened pattern restricted to small spots, stigmal area small; mesonotal praescutum light cinnamon brown, the lateral margin and dorsopleural membrane broadly and abruptly yellow, pleura yellowed, with 2 longitudinal stripes, the dorsal one blackened, extending from cervical region to abdomen; male hypopygium with ventral dististyle smaller, subequal in area to the basistyle, rostrum with 2 spines  
*L. (R.) subpectinata* (Williston)
7. Darkened wing pattern sparse, especially before cord, the areas in costal field not attaining costa, axillary region not whitened, vein *Sc* long, *Sc*<sub>1</sub> ending nearly opposite fork of *Rs*, *m-cu* beyond fork of *M*; antennae not known for male sex, in female flagellar segments short-unipectinate, basal segments darkened, outer 4 or 5 yellowed, including the terminal one..... *L. (R.) steyskali*, new species
- Darkened wing pattern more extensive and conspicuous, the major subcostal areas reaching costa, axillary region whitened, vein *Sc* shorter, *Sc*<sub>1</sub> ending nearly opposite midlength of *Rs*, *m-cu* shortly before fork of *M*; antennae of both sexes short-unipectinate, darkened, with 4 subterminal segments (10 to 13) pale, terminal segment dark brown; male hypopygium (Figure 27)..... *L. (R.) tetraleuca* Alexander

*Limonia (Rhipidia) bipectinata* (Williston), 1896

FIGURE 25

*Rhipidia bipectinata* Williston, 1896, pp. 285-286, fig. 54.

Type from Saint Vincent, at 304.8 m (1,000 ft), collected by H. H. Smith.

The specimens from Dominica agree well with Williston's brief description. A few supplementary notes are provided, based on the present specimens.

MALE.—Length about 6.5-7 mm; wing 8-9 mm; antenna about 2.8-2.9 mm.

Antennae dark brown, terminal segment abruptly whitened, longer than the penultimate; flagellar segments 2 to 11 bipectinate, with a further small spur placed slightly more distally, directed obliquely outwardly; branches of segments 2 and 11 slightly unequal, about one-fourth longer than the segment, branches of other segments longer, about one-half to two-thirds longer than the segment. Wings with vein *Sc*<sub>1</sub> about opposite fork of *Rs*; *m-cu* at fork of *M* to slightly beyond at near one-fifth the length of *M*<sub>3+4</sub>. Male hypopygium (Figure 25) with the tergite, *t*, transverse, both the anterior and posterior borders nearly truncate, the latter very slightly emarginate. Basistyle, *b*, with ventromesal lobe large, with numerous very long setae. Dorsal dististyle, *d*, gently curved, terminating in a long black spine; ventral style relatively small, its area less than that of the basistyle; rostral prolongation long and stout, the 2 long slender spines placed close together, longer than the prolongation beyond their bases. Gonapophysis, *g*, with mesal-apical lobe darkened, broad, base obtuse.

Particular attention is called to the antennae, especially the whitened terminal segment and the approach to a tripectinate condition of the flagellar segments, better developed in other members of the subgenus, as *Limonia (Rhipidia) tripectinata* Alexander, of Colombia.

DOMINICA.—Male, 2,736 m (1.7 miles) east of Pont Casse, 10 March 1965 (Wirth); male, 321.8 m (0.2 mile) east, 10 April 1966 (Gagné).

*Limonia (Rhipidia) domestica* (Osten Sacken), 1859

*Rhipidia domestica* Osten Sacken, 1859, p. 208.

*Rhipidia domestica*.—Alexander, 1919b, p. 893, fig. 40.

*Limonia (Rhipidia) domestica*.—Alexander, 1942, p. 328, fig. 37c.—1939b, p. 94.

One of the most widely distributed crane flies in America. There is considerable variation in body and wing coloration and in the degree of pectination of the male antennae. As presently known, the number of rostral spines of the male hypopygium ranges from 2 to 4.

DOMINICA.—Cabrit Swamp, 23 February 1965, light trap (Wirth). Clarke Hall, 8-17 January 1965 (J. F. G. and Thelma Clarke), 11 January-31 March 1965, chiefly at light; 1 female reared from banana stem, emerged 6 February 1965 (Wirth); 28 March 1966 (Gagné), 28 May-8 June 1966 (Steyskal), 6-31 October 1966 (Gurney). La Plaine, 17 February 1964 (Bray). Lisdara Estate, 548.6 m (1,800 ft), August 1937 (Hodge). Marigot, July 1938 (Hodge). Pont Casse, 4,023 m (2.5 miles) west, 27 January 1965, at

light (Wirth), 2,414 m (1.5 miles) west, 3 April 1965 (Davis); South Chiltern, 2 November 1966 (Gurney), Springfield, November 1967 (Krauss), Sylvania, 23 January 1965, light trap (Wirth), 25 October 1966 (Gurney).

*Limonia (Rhipidia) eremnocera*, new species

FIGURE 26

Allied to *Limonia (Rhipidia) domestica*; antennae uniformly brownish black, flagellar segments of male moderately produced; thoracic pleura above lined with brown, beneath extensively yellowed; legs brownish yellow, apices of fore pair darker brown; wings brownish yellow, restrictedly patterned with brown, including 4 darker subcostal areas, additional to the small solidly darkened stigma, remainder of wing with paler brown seams; male hypopygium with ventral dististyle large, nearly three times the basistyle, rostral prolongation long, with 3 long pale spines.

MALE.—Length about 5 mm; wing 5.3 mm; antenna about 1.1 mm.

FEMALE.—Length about 5.5 mm; wing 6 mm.

Rostrum and palpi very small, black. Antennae brownish black throughout; intermediate flagellar segments of male moderately produced, with short but conspicuous pedicels; terminal segment nearly twice the penultimate. Eyes of male large, above broadly contiguous or virtually so; posterior vertex brownish gray.

Pronotum brown, darker laterally. Mesonotal praescutum obscure yellow laterally, disk with a brown central stripe that is paler and more narrowed at near midlength, lateral stripes scarcely indicated, short and pale, humeral and lateral borders more darkened; scutellum and much of scutum obscure yellow, centers of lobes darker; postnotum brownish yellow. Pleura chiefly darkened, including a dorsal stripe, beneath, including the lower sternopleurite, patterned with obscure yellow. Halteres with stem yellow, knob weakly darkened. Legs with coxae obscure yellow, bases patterned with brown; trochanters light yellow; femora brownish yellow, apices of fore pair darker brown; remainder of legs brownish yellow, outer tarsal segments brown. Wings brownish yellow, with 4 brown costal areas that are somewhat smaller than the interspaces, darker in cell  $Sc_1$ ; stigma brown, small and solidly darkened; elsewhere on disk with pale brown washes in cells beyond cord, wing apex pale; cord and outer end of cell  $1st M_2$  narrowly seamed with pale brown; an isolated pale brown cloud in cell  $Sc_2$  beyond the

stigma, as also found in certain allied species; veins brown. Venation:  $Sc$  relatively long,  $Sc_1$  ending about opposite midlength of  $R_5$ ;  $m-cu$  some distance before fork of  $M$ , up to three-fourths its own length.

Abdominal tergites vaguely bicolored, brownish yellow, apices darker; sternites more obscure yellow, incisures narrowly pale brown; genital segments in both sexes more yellowed. Male hypopygium (Figure 26) with the tergite,  $t$ , transverse, posterior border very shallowly emarginate, lateral and posterior margins with abundant long setae. Basistyle,  $b$ , slightly more than one-third the area of the ventral dististyle. Dorsal dististyle,  $d$ , long, gently curved, terminating in a long spine; ventral style with rostrum pale, relatively long, with 3 long recurved pale spines on face at near midlength. Apical lobes of aedeagus small.

Holotype, male, Clarke Hall, 11–20 March 1965 (Wirth). Allotype, female 2,736 m (1.7 miles) east of Pont Casse, in light trap, 24 March 1965 (Wirth).

Although the present fly is generally similar and closely allied to *Limonia (Rhipidia) domestica* (Osten Sacken), it differs in some important characters, as the uniformly darkened antennae and in the wing pattern, including the small, solidly darkened stigmal area.

*Limonia (Rhipidia) steyskali*, new species

Size large (wing and body of female about 9 mm); general coloration of thoracic dorsum brownish yellow, posterior sclerites darker, pleura with a conspicuous blackened longitudinal stripe; antennae of female with all flagellar segments except the last strongly unipectinate, branches relatively slender, about two-thirds the segments; apex of knob of haltere infuscated; legs brownish yellow, tips of fore femora narrowly pale brown; wings with posterior cells weakly darkened, those of anterior half more yellowed, with a restricted pale brown pattern that includes the cord, outer end of cell  $1st M_2$  and origin of  $R_5$ , with virtually no darkenings on proximal half of wing;  $Sc$  long,  $Sc_1$  ending nearly opposite fork of  $R_5$ ,  $Sc_2$  near its tip, basal section of  $R_{4+5}$  long, about five-sixths  $R_5$ , cell  $1st M_2$  small,  $m-cu$  at near one fourth  $M_{3+4}$ ; abdomen obscure brownish yellow, patterned with pale brown; ovipositor with cerci relatively slender, with a small point on dorsal margin before apex.

FEMALE.—Length about 7–9 mm; wing 7–9 mm; antenna about 1.8–2 mm.

Rostrum dark brown; palpi black. Antennae of female with scape obscure yellow, pedicel and prox-

imal 4 or 5 flagellar segments dark brown, intermediate segments paler brown, the outer 5 or 6 light yellow, in the paratypes the proximal flagellar segments pale brown, the outer 6 or 7 yellow; all flagellar segments excepting the last with a strong branch to produce a subpectinate appearance, on intermediate segments about one-half longer than the protuberance, outer end of each segment abruptly narrowed into a glabrous pedicel. Eyes very large, eliminating the anterior vertex, posterior vertex dark brownish gray.

Cervical region and pronotum brownish black. Mesonotal praescutum with 3 confluent brownish yellow stripes that are vaguely separated, darker behind, lateral praescutal borders clearer yellow; scutal lobes brown, central region and scutellum obscure yellow; mediotergite brown, pleurotergite more yellowed. Pleura with a conspicuous blackened stripe, sternopleurite broadly light brown, dorsopleural region yellowed. Halteres with stem yellow, apex of knob infuscated. Legs with coxae yellow, fore pair darker basally, trochanters yellow; femora obscure brownish yellow, apices of fore pair narrowly pale brown; tibiae and tarsi brownish yellow; claws of female short, with 2 teeth, the outer larger, stout. Wings relatively long and narrow, cells of anterior half yellowed, prearcular and costal fields clear light yellow, remainder of ground before the cord weakly darkened; a restricted pale brown pattern that includes areas at origin of  $R_s$ , fork of  $Sc$ , cord, and outer end of cell  $1st M_2$ , as well as an isolated area over vein  $R$  at near two-thirds vein  $R$ ; a vague darkened cloud in centers of cells  $R_2$  and  $R_3$  before tips, extreme wing apex in medial field darkened; stigma small and relatively inconspicuous, pale brown, its proximal end more yellowed; no darkenings basad of cord excepting the single darkened cloud on vein  $R$  as described; in the paratypes the darkened pattern is slightly more extensive and the veins darker; veins light brown, more yellowed in the brightened fields, darker in the patterned areas. Longitudinal veins beyond cord, as well as  $R_s$ , with trichia, lacking on basal veins excepting  $C$  and  $R$ . Venation:  $h$  oblique;  $Sc$  long,  $Sc_1$  ending nearly opposite fork of  $R_s$ ,  $Sc_2$  near its tip;  $R_s$  arcuated at base, subequal to  $R_{2+3}$ ; basal section of  $R_{4+5}$  long, about five-sixths  $R_s$ ; cell  $1st M_2$  small, nearly rectangular, shorter than any of the veins beyond it;  $m-cu$  at near one-fourth  $M_{3+4}$ .

Abdomen obscure brownish yellow, clearer yellow on central parts of tergites; sternites light yellow, in-

cisures pale brown; dorsopleural membrane dark brown. Ovipositor with cerci relatively slender, on dorsal margin with a small point before the slightly longer apex.

Holotype, female, 2,736 m (1.7 miles) east of Pont Casse, Dominica, 10 March 1965 (Wirth). Paratypes, 3 females, Pont Casse, 22–23 November 1964 (Spangler.)

I dedicate this fly to George C. Steyskal, distinguished student of Diptera in the United States National Museum. In the toothed cerci the species obviously is related to *Limonia (Rhipidia) bellingeri* Alexander, of Jamaica, which differs evidently in the pattern and venation of the wings, including a series of darkened areas in cell  $Sc$ . The flagellar branches in the female are much stouter than in the present fly. The antennae, venation, and ovipositor have been figured in an earlier paper (Alexander, 1964a, figs. 21, 22). The male sex still remains unknown in both of these flies and the condition of the antenna in this sex presumably will provide further characters.

#### *Limonia (Rhipidia) subcostalis* (Alexander), 1922

*Rhipidia (Rhipidia) subcostalis* Alexander, 1922, pp. 3–4.  
*Limonia (Rhipidia) subcostalis* (Alexander), 1964a, pp. 35–37, figs. 23, 28, 30.

The type-male was from Tiribi, Costa Rica, 9 October 1920 (United States National Museum no. 24,695). Later recorded from Cuba and Jamaica. Distinguished from the generally similar *Limonia (Rhipidia) unipunctinata* (Williston), of Saint Vincent by having 11 branched flagellar segments in the male instead of 8 as in the latter species. The rostral spines of the ventral dististyle are unusually short and inconspicuous.

DOMINICA.—2,736 m (1.7 miles) east of Pont Casse, 10 March 1965 (Wirth).

#### *Limonia (Rhipidia) subpectinata* (Williston), 1896

*Rhipidia subpectinata* Williston, 1896, p. 287, fig. 57.  
*Limonia (Rhipidia) subpectinata*.—Alexander, 1950, p. 200.

Types from Saint Vincent, 304.8 m (1,000 ft), collected by H. H. Smith. Known also from Dominica and Grenada. The antennae of the type were described by Williston as being yellow, slightly brownish at tip, but in all materials available to me these structures

are dark in color, with the 2 subterminal flagellar segments pale. Despite this discrepancy I believe that my identification is correct.

DOMINICA.—Clarke Hall, 8–10 January—1–10 March 1965, at light and in Malaise traps (Wirth); 24 May 1966 (Steyskal); reared from banana stem, no. 65 W 41, 10 February 1965 (Wirth), reared from rotting cacao pods, no. 65 W 3, 31 January 1965 (Wirth). Pont Casse, 22 November 1964 (Spangler). South Chiltern, 8–10 December 1964 (Spangler).

*Limonia (Rhipidia) tetraleuca* Alexander, 1937

FIGURE 27

*Limonia (Rhipidia) tetraleuca* Alexander, 1937a, pp. 182–183.

The type, a female, was taken along the El Yunque trail, Luquillo National Forest, Puerto Rico.

The male here discussed agrees well with the type, differing chiefly in sexual characters. Antennae with scape light brown, pedicel and flagellum darker brown; four subterminal segments light yellow, as in the type-female; 1st and 2nd flagellar segments produced into simple stout lobes, branches of intermediate segments much shorter than in *Limonia (Rhipidia) subcostalis*, the longest subequal to the segment; outer pale segments with the branch stout, shorter than the segment. Male hypopygium (Figure 27) much as in *L. (R.) subcostalis*, especially in the very short rostral spines of the ventral dististyle, the rostrum deeper, blade-like, with the spines placed on the face of the blade. The only male available shows 3 rostral spines on one side, 2 on the other, as shown in the subfigure. Ninth tergite, *t*, with posterior border very shallowly emarginate, in *L. (R.) subcostalis* with the border evenly convex.

It should be noted that *Limonia (Rhipidia) subcostalis* has the antennal flagellum uniformly darkened, with the branches of the intermediate segments long and slender, approximately twice the segments, of the penultimate and antepenultimate subequal to the segment.

DOMINICA.—Pont Casse, 12–14 October 1964 (Spangler).

*Limonia (Rhipidia) willistoniana* Alexander, 1929

FIGURE 28

*Rhipidia costalis* Williston, 1896, pp. 286–287, fig. 56.

*Limonia (Rhipidia) willistoniana* Alexander, 1929a, p. 246.

New name for *costalis* Williston, preoccupied by *Limonia costalis* (Wiedemann), 1824, p. 10.

The type was from Saint Vincent, altitude 457.6 m (1,500 ft), collected by H. H. Smith. Known also from Dominica and from Costa Rica.

Williston's figure of the male antenna correctly shows the outer 3 segments simple and emphasizes the very unusual length of the flagellar verticils. These are much longer than the segment and are placed on the basal enlargement opposite the point of insertion of the branches. First flagellar segment unbranched, apical pedicel abrupt; 2nd and 3rd segments with the branches very unequal, the longer one subequal to the segment; flagellar segments 4 to 8 inclusive with branches longer than the segments, slightly unequal, tipped with a single long seta; 9th segment with a single branch subequal to the segment; 10th and 11th segments with branches indicated only by a low tubercle; terminal segment dilated on more than basal half (antenna, Figure 28). Male hypopygium (Figure 28) with tergite, *t*, transverse, narrowed outwardly, posterior border shallowly emarginate, the low lobes with thickened borders, each with about a dozen long setae. Basistyle, *b*, with body and ventromesal lobe subequal in extent, setae of the latter long and slender. Dorsal dististyle, *d*, a very gently curved darkened rod, tip suddenly curved, placed in a shallow emargination of the ventral style; rostral prolongation long, the 2 spines very long, widely separated, arising from small basal tubercles, the longer outer spine exceeding the prolongation and more than one-half the dorsal dististyle. Gonapophysis, *g*, with mesal-apical lobe stout, darkened, tip obtuse. Aedeagus with apex weakly bilobed.

DOMINICA.—Clarke Hall, 11–20 January, 1–10, 20–28 February 1965 (Wirth), 4 February 1964 (Bray), 6–8 October 1966 (Gurney). Fond Figues River, 13 March 1965 (Wirth). Pont Casse, 23 November 1964 (Spangler), 28 October 1966 (Gurney). Sylvania Estate 548.6 m (1,800 ft), 29 August 1938 (Hodge). Trafalgar Falls, 365.7 m (1,200 ft), 5–6 April 1966 (Gagné).

Genus *Orimarga* Osten Sacken*Orimarga* Osten Sacken, 1869, p. 120.Subgenus *Diotrepha* Osten Sacken, 1878, pp. 219–220.Key to Subgenera and Species of *Orimarga*

- Wings (Figure 30) with 3 branches of media— $M_{1,2}$ ,  $M_3$ , and  $M_4$ ;  $m-cu$  moderately retracted, about opposite base of  $R_5$  or close to midlength of vein  $Cu$ ; legs extensively black, outer tarsal segments white. . . . . (*O. (O.) nimbicolor*, new species) *Orimarga* Osten Sacken
- Wings (Figure 31) with 2 branches of media— $M_{1,2}$  and  $M_4$ ;  $m-cu$  far retracted, placed some distance before origin of  $R_5$  or opposite approximately one-fourth to one-fifth the length of vein  $Cu$ ; legs light brown, femora with tip brownish black, preceded by a subequal whitened ring, tarsi and tips of tibiae white. . . . . (*O. (D.) bifidaria*, new species) *Diotrepha* Osten Sacken

*Orimarga (Orimarga) nimbicolor*, new species

FIGURES 30, 32

Allied to *Orimarga (Orimarga) dichroptera*. Thorax laterally with 2 silvery white longitudinal stripes, the dorsal one on lateral border of praescutum, ventral stripe on pleura; femora brownish yellow, tip brownish black, tibiae and proximal end of basitarsi black, remainder of tarsi excepting the terminal segment snowy white; wings long and narrow, with a slender basal petiole, strongly darkened anteriorly, outer half behind the radial field paler; vein  $Sc$  very short, ending far before origin of  $R_5$ , cell 2nd  $A$  short and narrow; male hypopygium with a single dististyle that terminates in 3 points or blades, basistyle with interbase extended into a long spine, gonapophysis terminating in 2 long spines, aedeagus relatively small and weak.

MALE.—Length about 8–10 mm; wing 5.3–6 mm; antenna about 0.7–0.8 mm.

FEMALE.—Length about 9 mm; wing 6 mm.

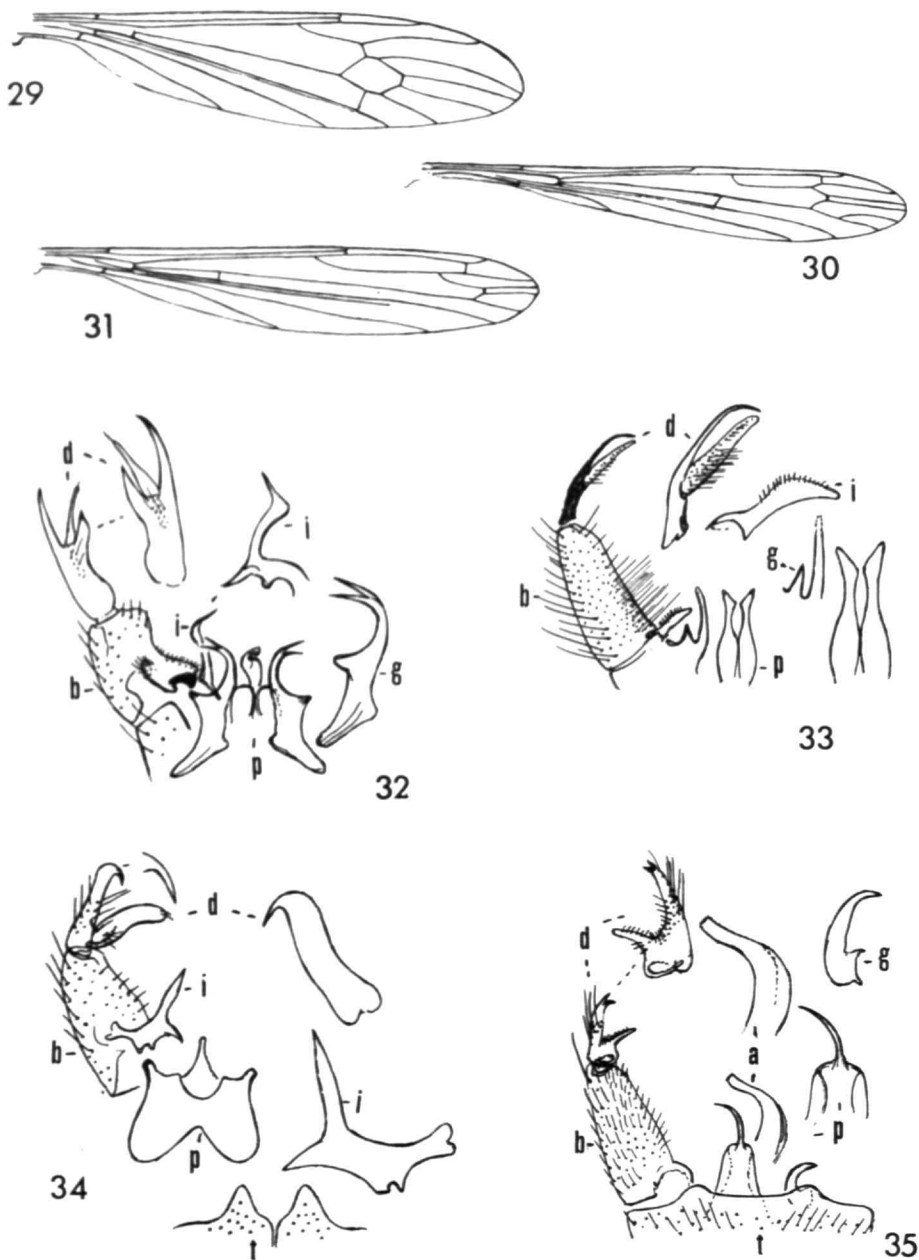
Rostrum, palpi, and antennae black; rostrum short, about one-half the remainder of head. Head blackened, gray pruinose.

Pronotum black, above pruinose. Mesonotum and pleura polished black, with 2 narrow, very conspicuous, light silvery longitudinal stripes, the dorsal one on lateral border of praescutum, extending backward to wing root, ventral stripe on dorsal portion of the extensive sternopleurite, from behind the fore coxae to base of abdomen. Halteres black. Legs with coxae and trochanters yellowish brown; femora brownish yellow basally, darker outwardly, tip brownish black; tibiae dark brown to brownish black; basitarsi chiefly black, the outer fourth and virtually all of remainder of tarsi snowy white, including the vestiture, terminal seg-

ment darkened. Wings (Figure 30) long and narrow, with prearcular field very narrow to produce a petiolate appearance with no indication of an anal angle, strongly darkened, the outer half behind the radial field paler, prearcular radial cell very large, conspicuously whitened; darkest areas include costal border, outer radial cells where they become more intense at tip, and a broad seam along vein  $Cu$  to margin; veins brown, trichia black. Longitudinal veins beyond general level of cord with strong trichia, including also the outer one-half to two-thirds of  $R_5$  and distal end of  $M$ , lacking on anal veins. Venation:  $Sc$  very short,  $Sc_1$  ending a distance before origin of  $R_5$  about equal to two-thirds to three-fourths the latter vein;  $R_{2,3}$  subequal to or a little shorter than  $R_{1,2}$  or about one-half longer than  $R_2$ , the latter in transverse alignment with  $r-m$ ;  $M_{3,4}$  subequal to or shorter than vein  $M_4$ ;  $m-cu$  opposite base of  $R_5$ , cell 2nd  $A$  narrow.

Abdomen unusually long, black. Male hypopygium (Figure 32) with outgrowths on mesal face of basistyle,  $b$ , culminating in a modified interbase that appears as a slender blade, the apex a long spine. Dististyle,  $d$ , single, basal half enlarged, terminating in 3 points or blades, as shown; on face of basal part with a group of about 18 setae, the outermost longest. Phallosome,  $p$ , complex, gonapophyses with outer arm slender, divided into 2 long spines; aedeagus relatively small and weak.

Holotype, male, Trafalgar Falls, Dominica, 365.7 m (1,200 ft) 5–6 April 1966 (Gagné). Allotype, female, Clarke Hall, along Cocoa Trail, 16 January 1965 (Wirth). Paratopotypes, 7 males, with type. Paratypes, 1 female, Carholm Estate, 7 February 1965 (Wirth); 1 male, Manets Gutter, 9 September 1965 (Jackson).



FIGURES 29-35.—Venation: 29, *Helius (Helius) albitarsis* (Osten Sacken); 30, *Orimarga (Orimarga) nimbicolor*, new species; 31, *Orimarga (Diotrepha) bifidaria*, new species. Male hypopygium: 32, *Orimarga (Orimarga) nimbicolor*, new species; 33, *Orimarga (Diotrepha) bifidaria*, new species; 34, *Epiphragma (Epiphragma) caribica*, new species; 35, *Shannonomyia urophora*, new species. [SYMBOLS: *a*, aedeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *i*, interbase; *p*, phallosome; *t*, tergite.]

The various Neotropical members of the subgenus *Orimarga* that have the legs darkened with the outer tarsal segments snowy white, and the wings with vein  $Sc$  short and having  $Sc_1$  ending some distance before the origin of  $R_s$ , include the following: *Orimarga* (*Orimarga*) *chionopus* Alexander, of Ecuador; *O.* (*O.*) *dichroptera* Alexander, Venezuela; *O.* (*O.*) *farriana* Alexander, Jamaica; *O.* (*O.*) *niveitarsis* Alexander, Panama, additional to the present species. All of these are distinguished chiefly by wing pattern and venation, the distribution of which coloration on the tarsi, and in hypopygial structure. This last character is unknown for some of these species, including *O.* (*O.*) *dichroptera*, which is most similar to the present fly, differing in the venation of the subcostal and radial fields. It appears certain that the male sex of this species when discovered will provide further characters for the separation of these flies.

#### Subgenus *Diotrepha* Osten Sacken

##### *Orimarga* (*Diotrepha*) *bifidaria*, new species

FIGURES 31, 33

General coloration of thorax brownish yellow, pleura clearer yellow, abdominal tergites light brown; rostrum light yellow, antennae black; femora pale brown, tip narrowly dark brown, preceded by a slightly broader and clearer white ring, tibiae with more than basal three-fourths pale brown, tip narrowly blackened, preceded by a broad white ring, tarsi snowy white; wings long and narrow, faintly darkened, prearcular and costal regions light yellow; male hypopygium with dististyles fused basally, phallosome complex, aedeagus relatively small, apex bifid, the blades short.

MALE.—Length about 6.8–7 mm; wing 5–5.6 mm.

FEMALE.—Length about 7.5–9 mm; wing 6–6.2 mm.

Rostrum and mouthparts light yellow, palpi with 1st segment obscure yellow, remainder black. Antennae black; flagellar segments long-oval to subcylindrical. Head light gray; eyes large, reducing the anterior vertex to a linear strip.

Cervical region and pronotum dark brown. Mesonotal praescutum almost uniformly brownish yellow; scutal lobes yellowish brown; scutellum and mediotergite darker brown; parascutella and pleurotergite more yellowed. Pleura brownish yellow to clearer yellow.

low. Halteres with stem whitened, knob medium brown. Legs with coxae and trochanters yellowed; femora pale brown, base narrowly more brightened, tip narrowly dark brown, preceded by a slightly wider clearer white ring; tibiae with more than basal three-fourths pale brown, tip narrowly blackened, preceded by a broad white ring; tarsi snowy white. Wings (Figure 31) long and narrow, faintly darkened, prearcular and costal fields light yellow; veins brown, yellowed in prearcular field. Trichia on vein  $R_{1,2}$ , all of  $R_3$ , and extensively on  $R_{4,5}$ ,  $M_{1,2}$  and  $M_{3,4}$ ; no trichia on  $Sc$  and with very few at distal end of  $R$ . Venation:  $Sc_1$  ending about opposite one-fourth  $R_5$ ,  $Sc_2$  at or some distance beyond end of  $Sc_1$ ;  $R_{2,3}$  variable in length, from about two to four times  $R_2$ .

Abdomen light brown, sternites more yellowed, outer 3 segments brownish black. Ovipositor with valves horn colored, cerci slender. Male hypopygium (Figure 33) with setae of mesal face of basistyle, *b*, abundant, more elongate near base. Dististyle, *d*, fused basally, the outer style narrowed gradually into a long spine, inner style virtually as long, with abundant setae, apex obtuse. Interbase and phallosome complex, the details about as shown. Aedeagus short, at apex split into 2 short flattened blades, their tips obtuse.

Holotype, male, D'leau Gommier, Central Forest Reserve, 518 m (1,700 ft), 26 May 1966 (Gagné). Allotype, female, Trafalgar Falls, 365.7 m (1,200 ft), 5–6 April 1966 (Gagné). Paratopotype, female, 15 February 1965 (Wirth). Paratypes, 2 females, with the allotype, 2 males, 2 females, Manets Gutter, 10 March 1965, in light traps (Wirth); 1 female, Fond Figures River, 13 March 1965, in light trap, 1 female, 9 February 1965 (Wirth); 1 female, along trail, 1,609 m (1 mile) north of junction of roads to Rosalie and Castle Bruce, 396 m (1,300 ft), 23 April 1966 (Gagné).

The most similar regional species are *Orimarga* (*Diotrepha*) *arawak* Alexander, of Jamaica, and the subgenotype, *O.* (*O.*) *mirabilis* (Osten Sacken), described from the southern United States and presumably extending farther south in tropical America. Williston's record of this species from Saint Vincent may well pertain to the present fly. It should be noted that his figure purporting to show the male hypopygium (1896, fig 65a) actually represents the ovipositor in lateral aspect. The aedeagus in the present fly is bifid, as described and figured, whereas in the two species compared above the organ is simple and very large.



## HEXATOMINI

## Key to the Genera of HEXATOMINI

1. Wings (Figures 40, 41) having  $R_s$  with 2 branches, vein  $R_2$  lacking ..... 2  
    Wings (Figures 36–39) with  $R_s$  3-branched, vein  $R_2$  preserved ..... 3
2. Rostrum elongate, exceeding one-half the remainder of body, the reduced palpi at extreme tip; wing (Figure 41) ..... *Elephantomyia* Osten Sacken  
    Rostrum short and inconspicuous, not exceeding the remainder of head; wing (Figure 40) ..... *Atarba* Osten Sacken
3. Wings (Figure 36) with a supernumerary crossvein in cell  $C$ , wings handsomely patterned ..... *Epiphragma* Osten Sacken  
    Wings (Figures 37–39) without supernumerary crossveins, unpatterned or only weakly variegated ..... 4
4. Wings (Figure 39) with cell  $1st\ M_2$  closed; antennae short in both sexes ..... *Shannonomyia* Alexander  
    Wings (Figures 37, 38) with cell  $M_1$  open by atrophy of  $M_2$ ; antennae of male longer than the wing, flagellar segments strongly binodose, the nodes with long outspreading setae (*Polymera* Wiedemann) 5
5. Wings (Figure 37) with  $M$  4-branched, cell  $M_1$  present *Polymera* (*Polymera*) Wiedemann  
    Wings (Figure 38) with  $M$  3-branched, cell  $M_1$  lacking . *Polymera* (*Polymerodes*) Alexander

Genus *Epiphragma* Osten Sacken

*Limnophila* (*Epiphragma*) Osten Sacken, 1859, p. 238.

*Epiphragma* Osten Sacken, 1869, pp. 193–194.—Alexander, 1948a, pp. 168–171.

*Epiphragma* (*Epiphragma*) *caribica*, new species

FIGURES 34, 36

General coloration of thoracic notum brown, margined with black, pleura chiefly black, lower part gray pruinose; antennae long, black, proximal flagellar segments patterned with yellow; no fusion segment, 1st flagellar segment elongate, equal to the combined 2nd and 3rd segments; femora yellowed outwardly, enclosing a broad blackened subterminal ring, tibiae and tarsi chiefly light brown; wings whitened, with a conspicuous solidly darkened brown pattern that includes 3 major darker brown costal areas, cell  $2nd\ A$  chiefly darkened, including the central half.

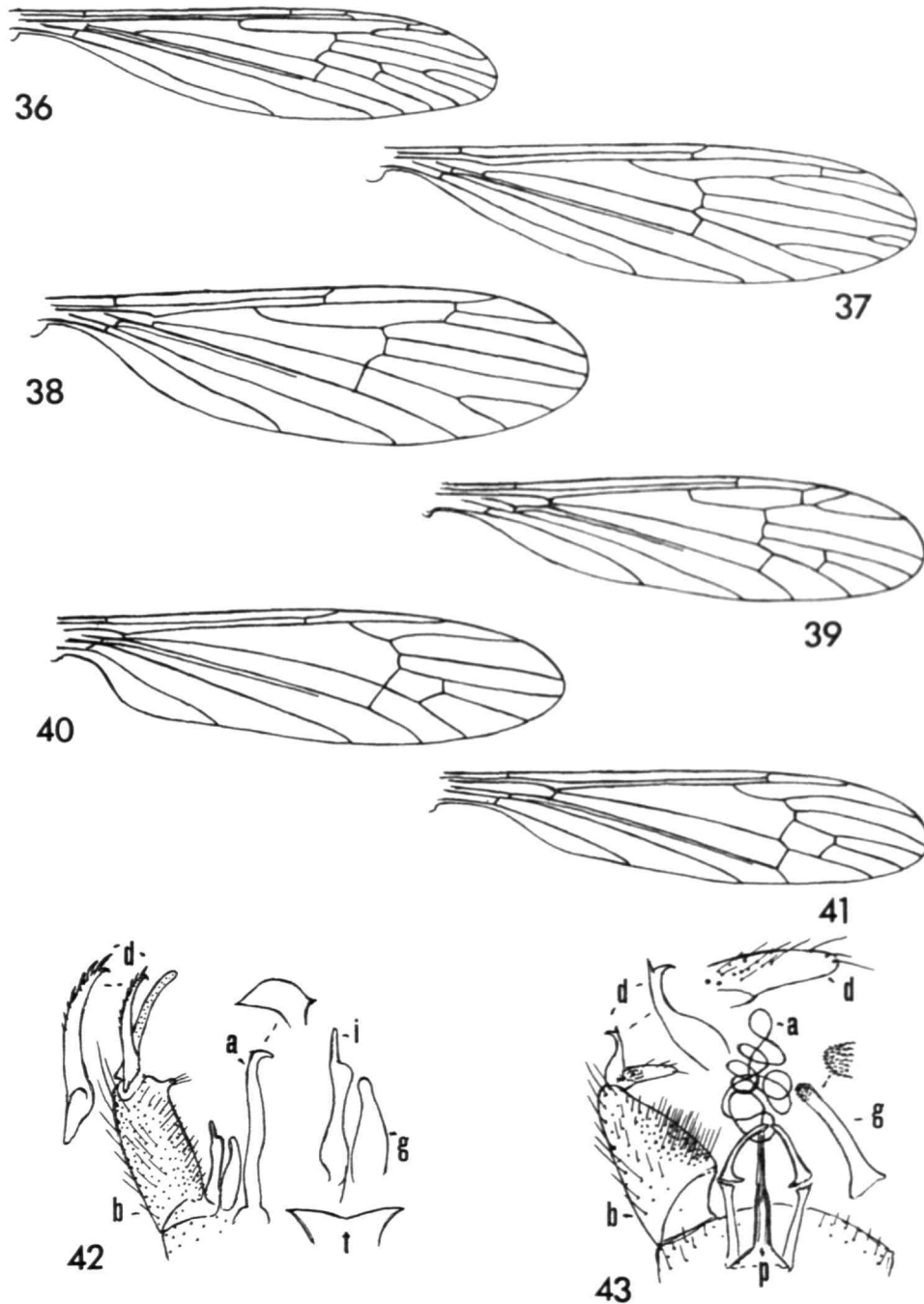
MALE.—Length about 10 mm; wing 9.5 mm; antenna about 4.5 mm.

FEMALE.—Length about 12.5 mm, abdomen alone 9 mm; wing 10 mm; antenna about 3.6 mm.

Rostrum dark brown, in front narrowly margined with obscure brownish yellow, mouthparts and palpi black. Antennae long, as shown by measurements; scape and pedicel brownish black, 1st flagellar segment light yellow, central 3rd infuscated; 2nd segment black, outer 4th yellowed, remainder of organ black excepting for extreme tips of segments 2 to 4

which are yellowed; all flagellar segments elongate, with no indication of fusion, the 1st very long-cylindrical, equal in length to the succeeding 2 segments and stouter; intermediate segments weakly dilated at bases, verticils a little shorter than the segments (in female, more so in male) and with short dense dark setulae over the entire surface; antennae of male slightly longer than in female. Head of male very large, especially the extremely large eyes, anterior vertex at narrowest point reduced to a space not exceeding the diameter of 2 rows of ommatidia. Head darkened, in female the extreme front end of anterior vertex with golden yellow areas, remainder dark grayish brown, occiput more darkened, in female anterior vertex subequal in diameter to that of the scape.

Mesonotal praescutum conspicuously patterned, disk pale; lateral and anterior margins broadly black, disk with anterior half chestnut brown, the expanded posterior half more yellow pollinose, with 6 dark brown longitudinal dashes arranged in a transverse row before the suture; scutum with anterior half brownish yellow, posterior half with a transverse brown band; scutellum dark brown, broadly margined with brownish yellow; mediotergite brownish black at either end, interconnected by a narrow central line, remainder of disk with golden yellow pollen, pleurotergite blackened. Pleura chiefly black, including a dorsal longitudinal stripe, ventral half extensively gray pruinose. Halteres elongate, stem brown, base narrowly yellowed, knob blackened in female, in male more weakly dark-



FIGURES 36-43.—Venation: 36, *Epiphragma* (*Epiphragma*) *caribica*, new species; 37, *Polymera* (*Polymera*) *albitarsis dominicae* Alexander; 38, *Polymera* (*Polymerodes*) *conjuncta* Alexander; 39, *Shannonomyia urophora*, new species; 40, *Atarba* (*Atarba*) *angustipennis* Alexander; 41, *Elephantomyia* (*Elephantomyia*) *pertenuis*, new species. Male hypopygium: 42, *Atarba* (*Atarba*) *angustipennis* Alexander; 43, *Elephantomyia* (*Elephantomyia*) *pertenuis*, new species. [SYMBOLS: a, aedeagus; b, basistyle; d, dististyle; g, gonapophysis; i, interbase; t, tergite.]

ened, apical border yellowed. Legs with coxae yellowed, with a transverse brownish black area shortly before tip; trochanters brownish yellow; femora light brown, extreme base pale yellow, outer fourth light yellow, enclosing a broad blackened subterminal ring that is about three times the yellow tip; tibiae with extreme base yellow, the succeeding fourth dark brown, in female the remainder very light brown, in male the darkened brown ring more extensive, involving more than one-half the segment; tarsi very light brown. Wings (Figure 36) narrow, whitened, with a conspicuous brown pattern, as common in the genus, the dark areas solid or virtually so, those of anterior third still darker, including 3 larger ones in cell *C* with vaguely paler centers, especially one at end of vein *Sc*; pattern in central half of wing ocelliferous, the ocelli large and open, the dark pattern subequal in extent to the ground; cell *1st A* with nearly the basal half unpatterned, cell *2nd A* in female chiefly darkened, including almost the central half, in male less extensively darkened, this including either end of cell and 3 confluent small marginal spots at near midlength; veins brownish black, those in the prearcular field and anterior border interspaces yellowed. Venation: Cell *M*<sub>1</sub> longer than its petiole; cell *1st M*<sub>2</sub> long and narrow; *m-cu* about its own length beyond fork of *M*.

Abdomen relatively long, as shown by the measurements, in female tergites yellowish brown, heavily patterned with darker brown, including a major area beyond the phragma, posterior and lateral borders narrowly yellow, in male, tergites more extensively darkened with only the posterior borders narrowly yellowed; sternites more extensively yellow, in female with a narrow pale brown ring at extreme base, terminal segment more uniformly medium brown. Male hypopygium (Figure 34) with tergal lobes, *t*, relatively long and narrow, tips obtuse. Basistyle, *b*, with normal pale setae and very abundant short dark setulae. Outer dististyle, *d*, with apex decurved into a slender spine, surface with several unusually long pale setae; inner style with tip obtuse, setae small, including a group of 5 or 6 near base. Interbase, *i*, with outer blade nearly straight, tip acute, not recurved as in various other regional species.

Holotype, female, 804.7 m (0.5 mile) north of Pont Casse, Dominica, 12 February 1965 (Wirth). Allotype, male 321.8 m (0.2 mile) east of Pont Casse, 5 May 1966 (Gagné).

The specific name, *caribica*, is a recognition of the Caribs of Dominica, last survivors of the formerly numerous aborigines of the Lesser Antilles (Hodge, 1942, pp. 189–201).

The most similar species are *Epiphragma* (*Epiphragma*) *circinata* Osten Sacken, of Central America, and *E. (E.) gracilicornis* Alexander, of Colombia, which likewise have conspicuously lengthened antennae, with all flagellar segments distinct, including the long-cylindrical basal one. The present fly differs in details of coloration of the body, legs, and unusually narrow wings. The antennal structure is noteworthy, especially the very long stout basal segment which is longer than in *circinata* which appears to be the most nearly allied species. *E. (E.) sackeni* Williston, of Saint Vincent, belongs to a different group of the genus, with the tricolored wing pattern showing the dark markings being separated from the paler ground by clear whitened borders. Other Neotropical species that have this type of wing pattern include *E. (E.) fabricii* Alexander (*maculata* Fabricius, preoccupied), *E. (E.) inaequicincta* Alexander, *E. (E.) interspersa* Alexander, *E. (E.) persancta* Alexander, and some others. Still other species from the Greater Antilles likewise are not closely related to the present fly, these including *E. (E.) cubensis* Alexander and *E. (E.) inornatipes* Alexander, of Cuba, and *E. (E.) auricosta* Alexander and *E. (E.) buscki* Alexander, of the Dominican Republic, Hispaniola.

#### Genus *Polymera* Wiedemann

*Polymera* Wiedemann, 1820, p. 40.—Alexander, 1948, pp. 168–171.

Subgenus *Polymerodes* Alexander, 1920b, p. 143.

#### *Polymera (Polymera) albitarsis dominicae* Alexander, 1939

FIGURE 37

*Polymera (Polymera) albitarsis dominicae* Alexander, 1939b, pp. 98–99.

Williston gives the body length for his series of 4 males and females of *albitarsis* Williston as being 6–7 mm. The present race is much smaller, with the following measurements:

MALE.—Length about 3.5–4 mm; wing 4–4.5 mm; antenna about 5–5.3 mm.

FEMALE.—Length about 4–4.5 mm; wing 5–5.5 mm. The venation of the present fly is shown (Figure 37).

DOMINICA.—Clarke Hall, 8–31 January, 1–10 February 1965, light trap (Wirth), 4 June 1966 (Steyskal). Fond Figue River, 13 March 1965, light trap (Wirth). D'leau Gommier, Central Forest Reserve, 15 February, 16 March 1965 (Wirth), 518 m (1,700 ft), 26 May 1966 (Gagné). 2,736 m (1.7 miles) east of Pont Casse, 12 March 1965, light trap (Wirth), 4,023 m (2.5 miles) east, along stream margin, 16 January 1965 (Wirth). Along trail, 1,609 m (1 mile) north of junction of roads to Rosalie and Castle Bruce, 396 m (1,300 ft), 29 March 1966 (Gagné). Type-male, Sylvania Estate, 548.6 m (1,800 ft), 30 August 1938 (Hodge).

### Subgenus *Polymerodes* Alexander

#### *Polymera (Polymerodes) conjuncta* Alexander, 1913

FIGURE 38

*Polymera conjuncta* Alexander, 1913a, p. 529, fig. 7.  
*Polymera (Polymerodes) conjuncta* Alexander, 1948a, pp. 182–190; 1920b, p. 143.

The types of *Polymera (Polymerodes) conjuncta* were from Pará, Brazil, collected in February 1912 by H. S. Parish. The generally similar *P. (P.) conjunctoides* Alexander, 1920b, from Amazonian Brazil, Ecuador, and Peru, has a narrow longitudinal blackened stripe on the thoracic pleura which is lacking or poorly evident in *P. (P.) conjuncta*. The present specimens show indications of such a stripe though less evident and until more materials become available it seems preferable to refer them to the present species. The venation is shown (Figure 38), with  $R_{2+3}$  very short, subequal to  $R_2$ , whereas in the holotype of *P. (P.) conjuncta* it is about one-half longer than  $R_2$  and oblique in position; in *P. (P.) conjunctoides* this vein is still more oblique to nearly longitudinal in position and fully twice the length of  $R_2$ . In the second available specimen the venation of the radial field is more as in typical *P. (P.) conjuncta*. It appears that these species are unusually variable and it is possible that a single species is represented under these two names. This is the first record of a species of *Polymerodes* in the North American fauna.

MALE.—Length about 3 mm; wing 3 mm; antenna about 4 mm.

DOMINICA.—Fond Figue River, 25 January 1965, 13 March 1965, light trap (Wirth).

### Genus *Shannonomyia* Alexander

*Shannonomyia* Alexander, 1929b, pp. 142–143.—1948b, pp. 518–520.

#### *Shannonomyia urophora*, new species

FIGURES 35, 39

General coloration of mesonotum light brown, ventral part of pleura light yellow; antenna of male short, proximal flagellar segments crowded, outer ones longer, with conspicuous verticils; vertex pale grayish white; legs pale brown; wings faintly tinged with brown, restrictedly patterned with darker brown; macrotrichia of veins unusually abundant, vein  $Sc$  long, cell  $1st M_2$  closed, elongate; male hypopygium with aedeagus pale, unusually broad, above its base with a depressed-flattened central plate, its truncated apex farther produced into a taillike extension.

MALE.—Length about 5 mm; wing 5.3 mm; antenna about 0.8 mm.

FEMALE.—Length about 7 mm; wing 7 mm.

Rostrum and palpi brownish black. Antennae of male short, as shown by the measurements; scape and pedicel clear light yellow, the former very long, about one-third the flagellum, the latter dark brown, first segment paler at base; flagellar segments short and crowded, verticils on outer faces, outer 4 segments elongate, with longer verticils, those of 10, 12, and 14 weaker than those of the alternate ones, terminal segment long, at apex with 4 strong verticils that are subequal to or slightly longer than the segment. Front broad; anterior vertex whitened, posterior vertex very pale grayish white.

Pronotum pale yellow, brown posteriorly. Mesonotum light brown, postnotum vaguely more pruinose; praescutal vestiture black, erect. Pleura light brown on dorsal half, light yellow ventrally. Halteres with stem pale, knob weakly darkened. Legs with coxae and trochanters yellow, remainder of legs very pale brown. Wings (Figure 39) faintly tinged with brown, prearcular and costal fields yellowed; a very restricted darker brown pattern includes small spots at origin of  $R_5$ ,  $Sc_2$ , cord, outer end of cell  $1st M_2$ , stigma, fork of  $R_{3+4}$ , and as minute marginal darkenings at ends of veins  $R_4$  and  $2nd A$ , smaller or lacking on other longitudinal veins; veins yellowed, darker in the patterned parts. Macrotrichia of longitudinal veins unusually abundant, beyond cord on all veins to  $Cu_1$ , and also on

$R_1$  and  $Sc$ , very sparse and scattered on 2nd  $A$ , lacking on  $Cu$  and 1st  $A$ . Venation:  $Sc$  long,  $Sc_1$  ending opposite three-fourths  $R_1$ ,  $Sc_2$  unusually close to tip;  $R_1$  strongly arcuated at origin;  $R_{1+2}$  and  $R_2$  subequal, the latter before the radial fork,  $R_{3+4}$  about one-half  $R_2$ ; cell 1st  $M_2$  elongate, shorter than distal section of  $M_{1+2}$ , slightly exceeding  $M_3$ ;  $m-cu$  at near one-third to one-fourth  $M_{3+4}$ .

Abdomen, including hypopygium, light brown. Male hypopygium (Figure 35) with axial terminal spine of outer dististyle,  $d$ , somewhat stouter than the subterminal outer point, setae of central area of outer face long; inner style with apical lobe slender, outer surface with erect to slightly reclinate pale delicate setulae. Gonapophysis,  $g$ , relatively large; aedeagus unusually broad, curved, pale, above its base with a broad depressed-flattened central plate, narrowed outwardly, apex truncated, farther produced into a slender taillike extension. I am uncertain as to the homologies of this structure.

Holotype, male, 2,736 m (1.7 miles) east of Pont Casse, Dominica, 12 March 1965 (Wirth). Allotopotype, female, 24 March 1965, light trap (Wirth).

Several other members of the genus are known from the Greater Antilles, including the Cuban *Shannonomyia brevicula* Alexander and *S. bruneriana* Alexander, which are most similar to the present fly in general appearance. The unusually stout aedeagus is suggestive of the condition in some species of *Limnophila* (*Phylidorea*), and in *Shannonomyia* is approached by *S. ovaliformis* Alexander, of Mexico.

The genus *Shannonomyia* includes many species throughout tropical America, including the extreme south, and with a few others, including the genotype, *S. lenta* (Osten Sacken) in the Nearctic. The various species show a surprising diversity in antennal structure and in the venation and trichiation of the wings. A number of species in South America have reduced wings, the condition culminating in *Shannonomyia* (*Roraimomyia*) *permonstrata* (Alexander), as presently known restricted to the summit of Mount Roraima, Venezuela. In this fly the wings are reduced to tiny pads that are appressed to the body while the halteres, which at first sight appear to be lacking, probably are represented by a microscopic knob with the stem lacking. This instance marks the extreme reduction in size of the halteres in the Tipulidae.

### Genus *Atarba* Osten Sacken

*Atarba* Osten Sacken, 1869, p. 127.—Alexander, 1948b, pp. 536–541.

#### *Atarba* (*Atarba*) *angustipennis* Alexander, 1928

Figures 40, 42

*Atarba* (*Atarba*) *angustipennis* Alexander, 1928b, p. 57.

The type, a female, was from the Sierra Rangel, Pinar del Rio, Cuba, 457.6 m (1,500 ft), 29 August 1927. Further specimens are from Loma del Gato, Sierra del Cobre, Cuba, 792.5–1,013.5 m (2,600–3,325 ft), 15–30 September 1935, and from El Vergel, Chiapas, Mexico, 800 meters (about 0.5 mile) 18 May 1935.

The genus *Atarba* is known from 2 species in Cuba and Jamaica and very numerous forms throughout continental Tropical America.

Male hypopygium (Figure 42) with the tergal horns,  $t$ , conspicuous. Basistyle,  $b$ , with a small tubercle on mesal face near apex. Outer dististyle slender, outer margin with a series of appressed spines, those near base smallest, outwardly gradually becoming longer and more appressed, the outermost longer than the small apical point. Aedeagus,  $a$ , long and pale, straight to gently sinuous, before apex on outer margin with a small point. Venation (Figure 40).

DOMINICA.—804.7 m (0.5 mile) east of Pont Casse, at light, 27 January 1965 (Wirth); 2,736 m (1.7 miles) east, at light, 12 March 1965 (Wirth); 4,023 m (2.5 miles) west, at light, 27 January 1965 (Wirth).

### Genus *Elephantomyia* Osten Sacken

*Elephantomyia* Osten Sacken, 1859, p. 220.—Alexander, 1948b, pp. 552–554.

As discussed under the accompanying description, there presently are known 3 species of *Elephantomyia* from the West Indian islands, including the new species here described.

Following our presently accepted system of classification in this family of flies, the genus is placed in the tribe Hexatomini, whereas the genus *Helius* is in the tribe Limoniini, as considered earlier in this report. It is becoming evident that these 2 genera are more nearly allied than the present arrangement shows. The structure, including especially the male hypopygium and the venation, shows marked points of similarity in the two groups. The problem had been

mentioned in another paper by the writer and seems to require further investigation (Alexander, 1964b, pp. 367-368).

*Elephantomyia (Elephantomyia) pertenuis*, new species

FIGURES 41, 43

Size small (body and wing between 6 and 7 mm); rostrum subequal in length to remainder of body; general coloration light yellow, the scutellum, central area of mediotergite, and the 8th abdominal tergite more infuscated; legs light brown; wings subhyaline, prearcular and costal regions light yellow, without darkened pattern other than the long-oval pale brown stigma; male hypopygium with numerous setae on mesal face of basistyle; phallosome with gonapophyses appearing as relatively broad blades, tip obtuse, membranous, with several microscopic points; penefilum very long and delicate, strongly looped.

MALE.—Length, excluding rostrum, about 6-6.5 mm; wing 6.2-7.2 mm; rostrum about 5-6.5 mm.

FEMALE.—Length, excluding rostrum, about 6.5 mm; wing 7 mm; rostrum about 7 mm.

Rostrum brown, subequal in length to remainder of body or to the wing. Antennae light brown; flagellar segments long, with very long verticils. Head yellow; vertex at midlength reduced to a narrow line, the eyes correspondingly large.

Thorax polished, almost uniformly light yellow, scutellum and central part of mediotergite slightly infuscated. Halteres yellow. Legs with coxae and trochanters light yellow; femora light brown, tips narrowly darker, preceded by a subequal slightly yellowed ring; tibiae light brown, tarsi slightly paler. Wings (Figure 41) subhyaline, prearcular and costal fields light yellow; no darkened pattern except for the long-oval pale brown stigma; veins brownish yellow, clearer yellow in the brightened parts. Macrotrichia on longitudinal veins beyond general level of origin of  $R_s$ , lacking on Anals. Venation:  $Sc_1$  ending about opposite two-thirds to three-fourths  $R_s$ ,  $Sc_2$  near its tip; both branches of  $R_s$  nearly parallel to one another, diverging

slightly at margin;  $m-cu$  beyond one-third the length of  $M_{3+4}$ , exceeding the distal section of  $Cu_1$ .

Abdomen yellow, pleural margins narrowly and vaguely more darkened, 8th tergite broadly brown, margined with yellow. Male hypopygium (Figure 43) with posterior border of tergite,  $t$ , very gently convex, with numerous setae. Basistyle,  $b$ , with numerous very long pale setae on mesal face. Both dististyles,  $d$ , terminal, outer style glabrous, basal half dilated, outer part narrowed, curved into a slender axial spine, outer margin with a smaller straight subterminal point; inner style longer, nearly straight, with several setae on basal half and 3 on outer margin before apex. Phallosome,  $p$ , with gonapophyses appearing as relatively broad nearly straight blades, outwardly only slightly produced, not pointed, terminating in pale membrane with numerous microscopic points; penefilum unusually long and very slender, conspicuously looped, its total length difficult to estimate but apparently subequal to the length of the combined 3 outer abdominal segments and possibly even longer.

Holotype, male, Fond Figes River, Dominica, in rain forest, 9 February 1965 (Wirth). Allotype, female, trail 1,609 m (1 mile) north of roads to Rosalie and Castle Bruce, 396 m (1,300 ft), 23 April 1966 (Gagné). Paratypes, 4 males, 321.8 m to 804.7 m (0.2-0.5 mile) east of Pont Casse, 10-11 April 1966 (Gagné); 1 male, Trafalgar Falls, 365.7 m (1,200 ft), 5-6 April 1966 (Gagné).

The present fly is distinct from the two members of the genus presently known from the Antilles. The larger *Elephantomyia (Elephantomyia) meridionalis* Alexander (*E. (E.) longirostris* Williston, preoccupied) has the body and wings conspicuously patterned with brown and with the rostrum elongate, nearly one-half longer than the remainder of body (male, length 6 mm; rostrum 8.5 mm). At present the species appears to be known only from Saint Vincent. The second species, *E. (E.) westwoodi antillarum* Alexander, is similar to the last in its large size and in the patterned body and wings. Presently it is known only from the Greater Antilles (Cuba, Hispaniola, Puerto Rico).

## ERIOPTERINI

Key to Genera of *ERIOPTERINI*

1. Rostrum very long and slender, approximately one-half the remainder of body, the reduced palpi at apex; setae of legs profoundly bifid; wings with  $R_s$  unbranched (Figure 64)
 

*Toxorhina* Loew
- Rostrum short, not exceeding remainder of head; setae of legs simple; wings with  $R_s$  having either 2 or 3 branches (Figures 44–47) ..... 2
2. Wings with  $R_s$  having 2 branches (Figures 44, 46, 47) ..... 3
- Wings with  $R_s$  having 3 branches (Figures 45, 60–63) ..... 6
3. Wings (Figure 44) with vein  $R_2$  present, placed close to fork of  $R_s$ ; vein  $Sc$  long,  $Sc_1$  ending beyond origin of  $R_s$  ..... *Teucholabis* Osten Sacken
- Wings (Figures 46, 47) with vein  $R_2$  lacking; vein  $Sc$  short,  $Sc_1$  ending opposite or before origin of  $R_s$  ..... *Gonomyia* Meigen (in part) 4
4. Wings (Figure 46) with cell  $M_2$  open by atrophy of basal section of vein  $M_1$ 

*Gonomyia* (*Neolipophleps*) Alexander
- Wings with cell 1st  $M_2$  closed ..... 5
5. Wings (Figure 47) with stigma dark brown, conspicuous; male hypopygium (Figures 57–59) with apex of basistyle produced into a spine ..... *Gonomyia* (*Paralipophleps*) Alexander
- Wings with stigma pale to scarcely indicated; male hypopygium (Figures 53–56) not produced into a spine ..... *Gonomyia* (*Lipophleps*) Bergroth
6. Wings (Figure 60) with veins  $R_1$  and  $M_{1+2}$  fused to comprise the entire cephalic border of cell 1st  $M_2$ ,  $r-m$  thus obliterated; 2 branches of  $M$  reach the margin; vein 2nd  $A$  short
 

*Trentepohlia* (*Paramongoma*) Brunetti
- Wings (Figures 44–47, 61–64) with vein  $R_1$  entirely separate from  $M_{1+2}$ ,  $r-m$  present; 3 branches of  $M$  reach the margin; vein 2nd  $A$  of normal length ..... 7
7. Wings (Figures 45, 61) with cell  $R_2$  shallow, subequal to or shorter than its petiole; vein  $R_2$  lacking ..... 8
- Wings (Figures 62, 63) with cell  $R_2$  deep, longer than its petiole; vein  $R_2$  present ..... 9
8. Wings (Figure 45) with vein  $Sc$  short,  $Sc_1$  ending opposite or before origin of  $R_s$ ; trochanters normal, short ..... *Gonomyia* (*Gonomyia*) Meigen
- Wings (Figure 61) with vein  $Sc$  long,  $Sc_1$  ending opposite or beyond midlength of  $R_s$ ; trochanters elongate ..... *Rhabdomastix* (*Sacandaga*) Alexander
9. Wings (Figure 62) with cell  $M_1$  open by atrophy of basal section of  $M_2$ ; legs with abundant long setae, without scales; male hypopygium with apex of aedeagus bifurcate, the branches recurved ..... *Erioptera* (*Mesocypbena*) Osten Sacken
- Wings (Figure 63) with cell  $M_1$  open by atrophy of  $m$ ; vestiture of legs including long, very narrow flattened scales; male hypopygium with aedeagus a simple straight spike, the tip acute ..... *Eriopterodes*, new genus

**Genus *Trentepohlia* Bigot**

*Trentepohlia* Bigot, 1854, pp. 456, 473.—Alexander, 1938, pp. 353–355; 1947a, pp. 69–72.

**Subgenus *Paramongoma* Brunetti**

Subgenus *Paramongoma* Brunetti, 1911, p. 295.  
Synonym. *Mongomella* Enderlein, 1912, p. 61.

***Trentepohlia* (*Paramongoma*) *dominicana* Alexander, 1947**

*Trentepohlia* (*Paramongoma*) *dominicana* Alexander, 1947a,

FIGURE 60  
pp. 71–72.

The holotype is from Dominica, as recorded below. The species is known from Puerto Rico (El Yunque, Luquillo National Forest). The venation is shown in Figure 60.

DOMINICA.—La Chaudiere, Hempstead River, 15 May 1940 (Hodge); type. Fond Figues River, 9–12 March 1965 (Wirth). 2,736 m (1.7 miles) east of Pont Casse, 10 March 1965 (Wirth).

**Genus *Teucholabis* Osten Sacken**

*Teucholabis* Osten Sacken, 1859, p. 222.—Alexander, 1927, pp. 17–27; 1946, pp. 375–400, 14 figs.

Key to Species of *Teucholabis*

1. Size small (wing of male to about 6.5 mm); legs with femora yellow, unpatterned except for narrow black tips of fore and middle pairs, in male, with no enlarged glandular area on basitarsus; wings with veins  $R_1$  and  $R_2$  divergent apically, cell  $R_1$  at margin widened, about two-thirds as extensive as cell  $R_2$ ; abdominal tergites annulated, bases dark brown, apices yellow; no setal modifications on sternite 6 in male; hypopygium (Figure 50)

*T. tenella*, new species

Size larger (wing of male about 7.5 mm or more); legs with femora darkened at or close to tip and with a central darkening, in male with a glandular swelling near proximal end of basitarsus; wings with veins  $R_1$  and  $R_2$  extending nearly parallel to one another throughout, cell  $R_1$  narrow, at margin only about one-third as extensive as cell  $R_2$ ; abdominal tergites annulated (*annulata*) or almost uniformly fulvous (*fulviventris*); 6th sternite in male with conspicuous modified setae. . . . . 2

2. Abdominal tergites conspicuously bicolored, the bases broadly brown, apices yellow; wings virtually unpatterned except for the small darkened stigma, apex not infuscated; male hypopygium (Figure 48) with apex of outer dististyle simple . . . . . *T. annulata* Williston  
Abdomen behind the 1st segment almost uniformly fulvous; wings with outer end, especially in the radial field, narrowly darkened; male hypopygium (Figure 49) with apex of outer dististyle bidentate. . . . . *T. fulviventris*, new species

*Teucholabis (Teucholabis) annulata* Williston, 1896

FIGURE 48

*Teucholabis annulata* Williston, 1896, p. 290, fig. 63.

The types were from Saint Vincent, without further data, collected by H. H. Smith.

Male hypopygium (Figure 48) with outer lobe of basistyle, *b*, relatively narrow, tip obtuse with sparse long setae; outer spine pale, narrowed to a blackened point, inner margin with a fringe of long yellow setae, mesal flange relatively small, with setae at anterior end, posterior margin with 3 or 4 large teeth. Outer dististyle, *d*, long and narrow, terminating in a single point; inner style with apex rounded, with about 5 long setae. Aedeagus unusually short and broad, compressed, terminating in a small darkened beak; 2 long dorsal setae and about a dozen ventral ones.

The species differs from *T. (T.) fulviventris* in important hypopygial characters. Basistyle, *b*, with the outer lobe narrow, the outer spine with a long fringe of setae, and the mesal lobe small. Both dististyles, *d*, likewise differ, including the simple apex of the outer style. The short aedeagus has the apical beak small and smooth.

DOMINICA.—Clarke Hall, 11–31 January, 1–10, 21–31 March 1965 (Wirth), 31 May 1966 (Steyskal). D'leau Gommier, 17 March 1956 (Clarke). 321.8 m (0.2 mile) east of Pont Casse, 10 April, 6 May 1966

(Gagné). Trail, 1,609 m (1 mile) north of junction of roads to Rosalie and Castle Bruce, 396 m (1,300 ft), 23 April 1966 (Gagné).

*Teucholabis (Teucholabis) fulviventris*, new species

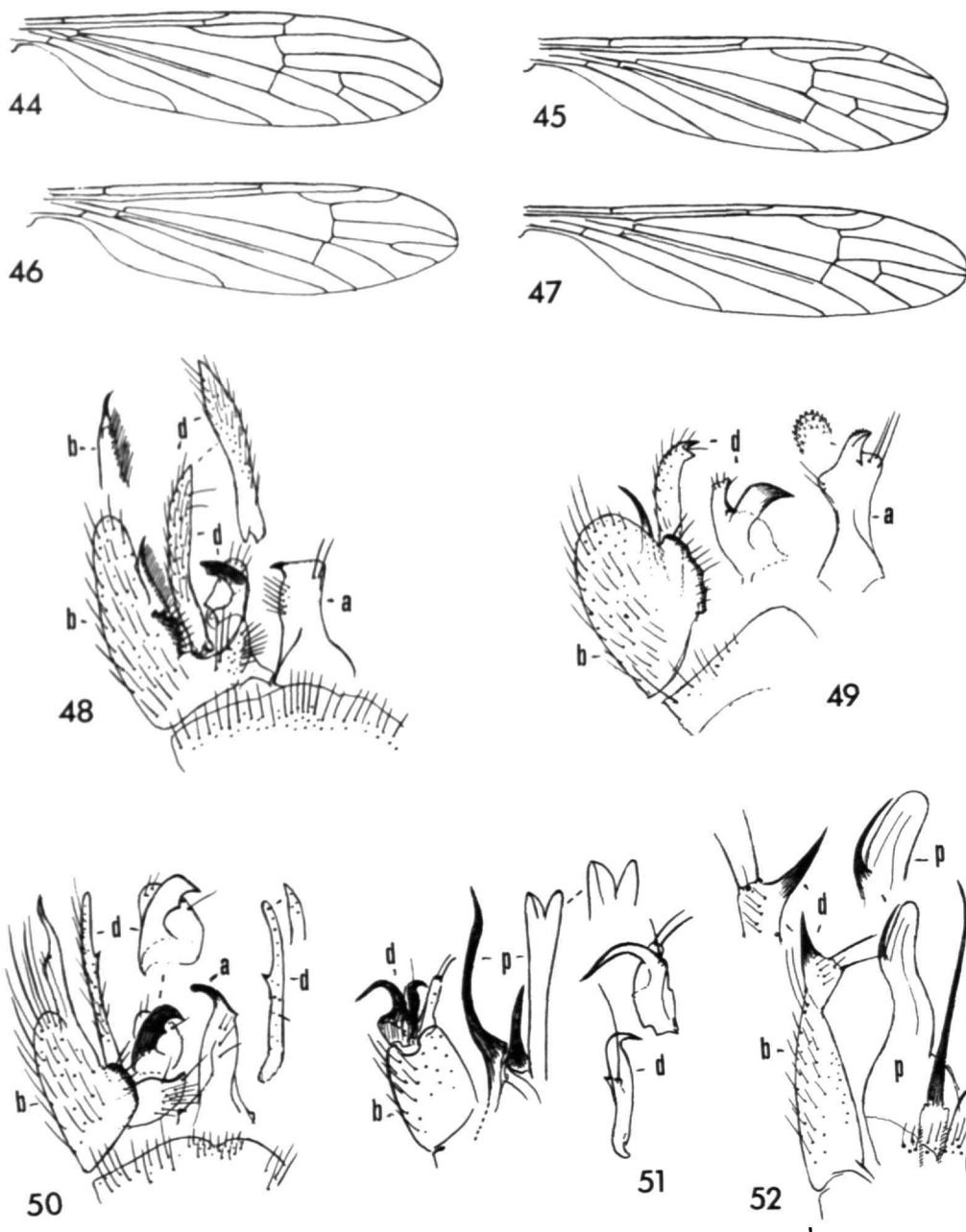
FIGURE 49

Allied to *melanocephala*; size relatively large (wing about 8 mm); head brownish black; prothorax fulvous, mesonotum orange, patterned with black, including major lateral praescutal areas; pleura blackened, extensively silvery pruinose; knob of halteres blackened, apex pale yellow; femora yellowed, with 2 brownish black rings, on middle and posterior legs broader to nearly confluent; tibiae and basitarsi brownish yellow, remainder of tarsi blackened; wings yellowed, prearcular and costal fields clear light yellow, restrictedly patterned with brown, including the narrow wing tip, vein  $Sc_1$  ending about opposite midlength of  $R_s$ , cell  $1st M_2$  closed; abdomen orange yellow, basal tergite and hypopygium darker; male hypopygium with outer spine of basistyle long and slender, mesal flange unusually large, margin roughened; outer dististyle bidentate at apex; outer end of aedeagus scooplike, margins microscopically toothed or scabrous.

MALE.—Length about 8.5–9 mm; wing 7.5–8.5 mm; antenna about 2–2.1 mm.

FEMALE.—Length about 10.5–11 mm; wing 7.5–7.8 mm.





FIGURES 44-52.—Venation: 44, *Teucholabis (Teucholabis) tenella*, new species; 45, *Gonomyia (Gonomyia) dominicana*, new species; 46, *Gonomyia (Neolipophleps) helophila* Alexander; 47, *Gonomyia (Paralipophleps) wirthiana*, new species. Male hypopygium: 48, *Teucholabis (Teucholabis) annulata* Williston; 49, *Teucholabis (Teucholabis) fulviventris*, new species; 50, *Teucholabis (Teucholabis) tenella*, new species; 51, *Gonomyia (Gonomyia) dominicana*, new species; 52, *Gonomyia (Lipophleps) acanthomelana*, new species. [SYMBOLS: a, aedeagus; b, basistyle; d, dististyle; p, phallosome.]

Rostrum fulvous, about one-third the remainder of head; palpi black. Antennae black; flagellar segments long-oval, subequal in length to the verticils. Head brownish black; anterior vertex about twice the diameter of scape.

Cervical region brownish black; pronotum fulvous. Mesonotal praescutum with ground dull orange, with 3 conspicuous blackened areas, including a central stripe beginning shortly behind anterior margin, ending far before the suture, slightly divided behind, lateral areas very extensive, polished black, extending from the lateral borders behind the foveae, crossing the suture to include the scutal lobes, narrowly confluent with the central stripe to isolate the humeral ground area from the posterior one; central area of scutum, scutellum and base of mediotergite orange, remainder of postnotum infuscated. Propleura orange; mesopleura blackened, very extensively silvery pruinose, dorsopleural region narrowly obscure yellow. Halteres with stem brown, knob brownish black, apex very pale yellow. Legs with fore coxae and trochanters orange, middle and hind coxae with outer faces blackened, trochanters yellow; fore femora yellow with 2 brownish black rings, the terminal one more extensive than the central darkening, both narrower than the intervening ground area; middle femora with darkened rings broader to virtually confluent except on lower surface; posterior femora dark brown to brownish black, bases obscure yellow; tibiae and basitarsi brownish yellow, remainder of tarsi brownish black; posterior basitarsi of male with an elongate sensory pocket close to base. Wings vaguely yellowed, prearcular and costal fields clear light yellow; stigma and narrow wing tip brown; very vague darkenings over cord and outer end of cell *1st M*<sub>2</sub>, indicated by a darkening of the included veins; very small pale brown clouds at origin of *R*<sub>5</sub> and near base of cell *1st A*; an even paler suffusion near outer end of cell *Cu*; veins brown, yellowed in the brightened fields. Venation: *Sc* long, *Sc*<sub>1</sub> ending about opposite midlength of *R*<sub>5</sub>, *Sc*<sub>2</sub> far retracted, *Sc*<sub>1</sub> about one-half *R*<sub>5</sub>; branches of *R*<sub>5</sub> nearly parallel to one another throughout their lengths, cell *R*<sub>2</sub> at margin more than three times as extensive as cell *R*<sub>1</sub>; *m-cu* shortly beyond fork of *M*.

Abdomen with basal tergite blackened posteriorly, remainder of organ orange yellow to fulvous, hypopygium slightly darker; sternites 2 to 4 with blackened

lateral areas. Sternal pocket of male blackened, broader than long, narrowed and rounded behind; sternite 6 with 2 longitudinal parallel rows of strong setae, totaling about 6 to 8 on either side. Abdomen with abundant erect yellow setae, those of hypopygium blackened. Male hypopygium (Figure 49) with outer spine of basistyle, *b*, broader at base, narrowed outwardly into a slender spine; mesal flange unusually large, more than one-third the length of the basistyle itself, outer margin irregularly roughened, with abundant setae over the whole length. Outer dististyle, *d*, a long yellow rod, apex bidentate, the lower point short and stout; inner style with outer blade darkened, cultriform, terminating in an acute point; basal lobe slender, subcylindrical, the truncate apex with a few setae, at its base with a small blackened spine. Aedeagus, *a*, with apex scooplike, doubled or folded, the margins microscopically toothed or scabrous; 2 dorsal setae and about 8 ventral ones, some longer.

Holotype, male, Clarke Hall, Dominica, 11–20 January 1965 (Wirth). Allotopotype, female, 21–28 February 1965, light trap (Wirth). Paratopotypes, both sexes, 11–31 January, 1–28 February 1965 (Wirth); 12 February 1965 (J. F. G. and Thelma Clarke); 4 February 1964 (Bray); 19–31 October, 12–17 November 1964 (Spangler); 18 July 1965 (Anderson); 19 April 1966 (Gagné); 22–31 October 1966 (Gurney). Paratypes, both sexes, Antrim, 304.8 m (1,000 ft), 11 March 1956 (Clarke); Bagatelle, 304.8 m (1,000 ft), 9 March 1965 (Clarke); Cabrit Swamp, 23 February 1965 (Wirth); Carholme Estate, 7 February 1965 (Wirth); Fond Figes, 17 March 1964 (Bray); La Plaine, 17 February 1964 (Bray); Pont Casse, 12–14 October, 23 November 1964 (Spangler), 8–14 October 1966 (Gurney); Portsmouth, 1–2 April 1966 (Gagné); South Chiltern Estate, 20 February 1965 (Wirth); Syndicate Estate, 5 March 1964 (Bray). One specimen, Clarke Hall, 11 February 1965, taken by Wirth, bears the label "reared from under bark, No. 63 W 45." The habitat indicated is the same as for all members of the genus where the immature stages are known.

*Teucholabis (Teucholabis) fulviventris* is readily told from its closest regional ally, *T. (T.) annulata* Williston, by the characters given in the key. It seems advisable to list the known members of the *T. (T.) melanocephala* group, all having the abdominal sternal pockets about as described for the present species.

These are distinguished among themselves by details of coloration of the body, legs, and wings, and especially by hypopygial structure, including the armature of the basistyle, both dististyles, and apex of the aedeagus. The species in the group are *T. (T.) amblyphallos* Alexander (Honduras to Ecuador); *T. (T.) angustapicalis* Alexander (Brazil); *T. (T.) annulata* Williston (Dominica, Saint Vincent); *T. (T.) atrolata* Alexander (Panama); *T. (T.) catharinensis* Alexander (Brazil); *T. (T.) egens* Alexander (Bolivia); *T. (T.) fulviventris*, new species (Dominica); *T. (T.) gowdeyi* Alexander (Cuba, Jamaica); *T. (T.) homilacantha* Alexander (Ecuador); *T. (T.) hondurensis* Alexander (Honduras); *T. (T.) inulta* Alexander (Brazil); *T. (T.) ludicra* Alexander (Peru); *T. (T.) melanocephala* (Fabricius) (northern South America); *T. (T.) neinulta* Alexander (Ecuador, Peru); *T. (T.) neosalva* Alexander (Peru); *T. (T.) oteroi* Alexander (Cuba); *T. (T.) perangusta* Alexander (Mexico to Venezuela); *T. (T.) salva* Alexander (Peru); *T. (T.) spica* Alexander (Ecuador).

***Teucholabis (Teucholabis) tenella*, new species**

FIGURES 44, 50

Size small (wing of male to about 6.5 mm); mesonotal praescutum light chestnut brown, humeral and lateral borders light yellow, pleura light yellow with a narrow dark brown longitudinal stripe; halteres with knob light yellow; fore and middle legs with femora, tibiae, and basitarsi yellow, tips narrowly dark brown, remainder of tarsi dark brown, posterior legs with femora and tibiae almost uniformly yellow; wings pale yellow, unpatterned except for the small pale brown stigma and a darkening over the cord,  $Sc_1$  ending beyond midlength of  $R_s$ ; abdominal tergites conspicuously patterned with yellow and brownish black, in male with broad blackened areas on either side, median and posterior regions yellow; male hypopygium with spine of basistyle pale, dilated at midlength, thence narrowed into a spine; mesal flange with margin smooth; terminal spine of aedeagus slender, curved.

MALE.—Length about 6.5–7 mm; wing 5.5–6.5 mm; antenna about 1.4–1.5 mm.

FEMALE.—Length about 5–6 mm; wing 4.8–5.5 mm.

Rostrum relatively short, chestnut brown, palpi brownish black. Antennae black; flagellar segments

oval, shorter than their verticils. Head yellow.

Pronotum and pretergites light yellow. Mesonotal praescutum with 3 virtually confluent light chestnut brown stripes, central area paler, humeral and lateral borders light yellow; scutal lobes light brown, midregion and posterior calli yellowed; scutellum clear light yellow, parascutella darker; mediotergite light brown, cephalic border darker, lateral margins yellowed, pleurotergite light brown, posterior border paler. Pleura light yellow, with a narrow dark brown longitudinal stripe extending from the cervical region to the pleurotergite. Halteres with stem obscure yellow, knob clear light yellow. Legs with all coxae and trochanters light yellow; fore and middle legs with femora, tibiae, and basitarsi yellow, tips narrowly dark brown, remainder of tarsi more uniformly dark brown; posterior legs almost entirely yellow, tips of femora and tibiae not or scarcely darker, outer segments infuscated; 5th tarsal segment with a strong basal epicondyle; no modification of basistyle. Wings (Figure 44) pale yellow, stigma brown, subcircular; cord narrowly darkened, the color virtually restricted to the veins, remaining veins yellow,  $m$  a little darker. Costal fringe of proximal third of wing relatively long and conspicuous. Venation:  $Sc$  long,  $Sc_1$  about opposite two-thirds the length of  $R_s$ ;  $R_{2+3+4}$  from about one-half to two-thirds  $R_2$ , cell  $R_2$  at margin more extensive than cell  $R_4$ ;  $m-cu$  close to fork of  $M$ .

Abdominal tergites conspicuously patterned with yellow and brownish black, in male the 2nd segment darkened medially, succeeding segments with broad black areas on basal two-thirds, the median region and posterior borders yellow, in cases the base of segment uniformly darkened, the median yellow pattern poorly indicated or lacking; hypopygium yellow; sternites more uniformly yellow; segments with long erect pale setae. In female abdominal tergites more uniformly dark brown, posterior borders obscure yellow, more extensive on anterior segments. Male with sternal pocket of 5th segment small and simple, including about 10 marginal setae that are directed inwardly, the laterals stouter, with about 4 smaller setae and longitudinal rows of microscopic setulae in the discal area; no definite setal pocket on 6th sternite. Male hypopygium (Figure 50) with spine of basistyle,  $b$ , a flattened pale blade, its outer end narrowed into a spine; mesal flange of style relatively small, the darkened margin entire,

with a few small setae near posterior end. Outer dististyle, *d*, a long slender blade bearing a small weak marginal spine beyond midlength; inner style with base a flat darkened blade, the free outer end shallowly bidentate, the teeth widely separated. Aedeagus with terminal spine slender, curved, basal enlargement with 5 setae, the outer unpaired bristle long.

Holotype, male, Clarke Hall, Dominica, 11–20 January 1965, in Malaise trap (Wirth). Allotopotype, female, 1–10 February 1965 (Wirth). Paratopotypes, both sexes, 11–20 January, 1–28 February, 1–10 March 1965, chiefly in light traps (Wirth); 13 June 1966 (Steyskal), 10 October 1966 (Gurney). Paratypes, both sexes, Cabrit Swamp, 23 February 1965, light trap (Wirth); Manets Gutter, 10 March 1965, light trap (Wirth); 804.7 m (0.5 mile) east of Pont Casse, 27 January 1965 (Wirth), 3,218 m to 4,828 m (2 to 3 miles) east of Pont Casse, 13–21 October 1966 (Gurney); Portsmouth, 2 March 1964 (Bray); Syndicate Estate, 5 March 1964 (Bray).

*Teucholabis* (*Teucholabis*) *tenella* has somewhat the appearance of *T. (T.) complexa* Osten Sacken, *T. (T.) jocosa* Alexander, and similar species, differing especially in the pattern of the legs and in hypopygial structure, including the aedeagus and lobes of the basistyle. This may be the species recorded from Saint Vincent by Williston as *T. (T.) complexa* but is an entirely distinct fly from the true *T. (T.) complexa* of eastern North America.

### Genus *Rhabdomastix* Skuse

*Rhabdomastix* Skuse, 1890, pp. 828–829.—Alexander, 1947b, pp. 318–322.

#### Subgenus *Sacandaga* Alexander

Subgenus, *Sacandaga* Alexander, 1911, pp. 349–352.

#### *Rhabdomastix* (*Sacandaga*) *fumipennis* Alexander, 1939

##### FIGURE 61

*Rhabdomastix fumipennis* Alexander, 1939b, pp. 99–100, fig. 9.

Known only from the female types taken at Sylvania Estate, 548.6 m (1,800 ft), 29 August 1938, by Hodge. Venation (Figure 61).

### Genus *Gonomyia* Meigen

*Gonomyia* Meigen, 1818, p. 146.—Alexander, 1947a, pp. 83–99.

#### Subgenus *Gonomyia* Meigen, 1818, p. 146.

#### Subgenus *Lipophleps* Bergroth, 1915, p. 55.

#### Subgenus *Neolipophleps* Alexander, 1947a, p. 98.

#### Subgenus *Paralipophleps* Alexander, 1947a, p. 97.

#### Subgenus *Progonomyia* Alexander, 1920a, p. 938.

### Key to Subgenera and Species of *Gonomyia*

1. Wings (Figure 45) with cell *R*<sub>2</sub> preserved, there being 4 branches of *R*  
*Gonomyia* (*Gonomyia*) Meigen (*G. (G.) dominicana*, new species)  
Wings (Figures 46, 47) with cell *R*<sub>2</sub> lacking, there being three branches of *R*..... 2
2. Wings (Figure 46) with cell *M*<sub>2</sub> open by atrophy of basal section of vein *M*<sup>1</sup>  
*Gonomyia* (*Neolipophleps*) Alexander  
(*G. (N.) helophila* Alexander)..... 3
- Wings (Figure 47) with cell 1st *M*<sub>2</sub> closed..... 3
3. Wings (Figure 47) with stigma dark brown, conspicuous  
*Gonomyia* (*Paralipophleps*) Alexander 4  
Wings with stigmal darkening inconspicuous, lacking or virtually so  
*Gonomyia* (*Lipophleps*) Bergroth 7
4. Male hypopygium (Figures 57–59) with basistyle near apex bearing 2 unequal spines..... 5  
Male hypopygium (Figure 59) with basistyle having a single spine  
*G. (P.) wirthiana*, new species
5. Male hypopygium with ventral plate of phallosome bifid at apex  
*G. (P.) pleuralis* (Williston) (extralimital)  
Male hypopygium (Figures 57, 58p) with ventral plate of phallosome obtuse or very shallowly emarginate at apex..... 6

6. Male hypopygium (Figure 57) with gonapophysis appearing as a narrow cultrate blade; ventral plate narrow, tip obtuse ..... *G. (P.) cultriformis*, new species  
 Male hypopygium (Figure 58) with gonapophysis a broad compressed blade; ventral plate broad, tip shallowly emarginate ..... *G. (P.) dikopsis*, new species
7. Male hypopygium (Figures 53, 54) with dististyle subterminal ..... 8  
 Male hypopygium (Figures 55, 56) with dististyle terminal ..... 9
8. Male hypopygium (Figure 54) with outer lobe of basistyle elongate, subequal to or exceeding the base of the style; dististyle very long and slender, strongly curved  
*G. (P.) producta* Alexander  
 Male hypopygium (Figure 53) with outer lobe of basistyle small, about one-third to one-fourth the base of the style; dististyle short and stout; gonapophyses appearing as small parallel or slightly decussate blades ..... *G. (L.) bicornuta* Alexander
9. Male hypopygium (Figure 55) with dististyle very small, virtually microscopic, bearing a tiny blackened point; phallosome including 2 long unequal slender spines  
*G. (L.) puella* (Williston)  
 Male hypopygium (Figures 52, 56) with dististyle larger, produced into a blackened spine or horn ..... 10
10. Male hypopygium (Figure 52) with phallosome including the very long slender aedeagus and a broader subtending plate that bears a slender appressed black spine; dististyle triangular in outline, at apex produced into a strong straight spine  
*G. (L.) acanthomelana*, new species  
 Male hypopygium (Figure 56) with phallosome including chiefly the long slender aedeagus; dististyle a strong curved horn ..... *G. (L.) puer* Alexander

### Subgenus *Gonomyia* Meigen

#### *Gonomyia (Gonomyia) dominicana*, new species

FIGURES 45, 51

Belongs to the *Gonomyia (Gonomyia) quaesita* group, allied to *G. (G.) animula*; mesonotal praescutum with 3 virtually confluent brown stripes; male hypopygium with outer dististyle terminating in a short curved hook, on outer margin with a single very long seta.

MALE.—Length about 3–3.5 mm; wing 3–4.5 mm; antenna about 0.7–0.8 mm.

FEMALE.—Length about 3.8–4 mm; wing 4.2–4.5 mm.

Rostrum yellow; palpi black. Antennae black, base of scape more yellowed; proximal flagellar segments crowded, oval, outer ones more elongate, slender; verticils of all segments relatively short, subequal to the segments. Front yellowed, remainder of head gray.

Pronotal scutum brownish yellow, scutellum clearer yellow. Mesonotal praescutum with 3 virtually confluent brown stripes, humeral and lateral parts broadly obscure yellow; scutal lobes brown, posterior sclerites somewhat lighter brown. Pleura yellowed. Halteres weakly infuscated. Legs with coxae and trochanters brownish yellow; remainder of legs dark brown to brownish black, including the vestiture. Wings (Figure 45) very weakly darkened, stigma not differentiated; veins light brown, trichia darker. Venation:  $Sc$  short,

$Sc_1$  ending a distance before origin of  $R_5$  that is about two-thirds the latter,  $Sc_2$  near its tip; vein  $R_3$  short to very short, oblique, as in the group;  $R_{1+2}$  and  $R_3$  at margin separated by a distance longer than vein  $R_3$ , in cases to more than twice this length;  $m-cu$  at near one-third  $M_{3+4}$ .

Abdomen light brown, hypopygium yellow. Male hypopygium (Figure 51) with dististyles,  $d$ , terminal; outer style shorter, narrow, appearing as a slender blade that terminates in a short curved hook, on outer margin at near two-thirds the length with a single very long seta, subequal in length to the entire style, in one specimen apparently with a marginal spine opposite this point; inner style larger, the pale yellow body long and narrow, terminating in 2 fasciculate setae, on outer margin near base with a powerful curved spine, near its base with a strong seta that is about one-fourth as long as the bristle of the outer style (for clarity the 2 sections of the style are shown as separated at bases; their correct relationship is as indicated in the subfigures provided). Phallosome,  $p$ , about as figured, including 2 unequal blackened spines and a larger pale yellow appendage that is infolded throughout most of its length, at base with a long slender pale spine.

Holotype, male, Clarke Hall, Dominica, 21–31 March 1965, in light trap (Wirth). Allotype, female, Fond Figues River, 13 March 1965, at light (Wirth). Paratopotypes, 2 males, 1 female, with type, 13–31

March 1965 (Wirth). Paratypes, 1 female, Manets Gutter, 10 March 1965 (Wirth); 5 females, Trafalgar Falls, 365.7 m (1,200 ft), 5–6 April 1966 (Gagné).

Other members of the *Gonomyia* (*Gonomyia*) *quaesita* group include *G. (G.) anduzei* Alexander, 1940 (Venezuela), *G. (G.) animula* Alexander, 1966 (Honduras), *G. (G.) birama* Alexander, 1941 (Peru), and *G. (G.) quaesita* Alexander, 1938 (Mexico). The hypopygium of the present fly is most as in *G. (G.) anduzei* and *G. (G.) animula*, differing in the details of the dististyles and phallosome.

### Subgenus *Lipophleps* Skuse

#### *Gonomyia* (*Lipophleps*) *acanthomelana*, new species

##### FIGURE 52

Size medium (wing of male about 3.5 mm); rostrum obscure yellow; antennae black; mesonotal praescutum and scutal lobes brown, posterior sclerites extensively yellowed; pleura yellow with 2 narrow brown longitudinal stripes that enclose a clearer yellow vitta; halteres and legs brown; wings tinged with brown, stigma very slightly darker, *Sc* short; male hypopygium with dististyle terminal, subtriangular in outline, outer angle produced into a powerful black spine; phallosome with gonapophysis a pale flattened blade, the margin at near three-fourths the length with a slender appressed spine; aedeagus long and slender.

MALE.—Length about 3 mm; wing 3.5 mm.

FEMALE.—Length about 3.8–4 mm; wing 3.6–4 mm.

Rostrum obscure yellow; palpi black. Antennae black. Head dark brown, sparsely pruinose.

Pronotal scutum light brown, scutellum and pretergites light yellow. Mesonotal praescutum brown, paler laterally; scutal lobes brown, midarea yellow; scutellum and postnotum yellow, central part of mediotergite light brown. Pleura yellow with 2 narrow longitudinal brown stripes, the dorsal one extending from lower cervical region to base of abdomen, ventral stripe more diffuse, the enclosed vitta somewhat clearer yellow. Halteres brown. Legs with coxae yellow, fore pair narrowly darkened apically; trochanters obscure yellow; remainder of legs brown. Wings tinged with brown, stigma very slightly darker; veins brown. Venation: *Sc* short, *Sc*<sub>1</sub> ending just before origin of *Rs*.

Abdominal tergites brown, sternites and genital segments yellow. Male hypopygium (Figure 52) with basistyle, *b*, narrowed outwardly; dististyle, *d*, terminal,

appearing as a subtriangular plate, the outer angle produced into a powerful black spine that narrows to an acute point; fasciculate bristles on inner face, widely separated. Phallosome, *p*, including a single well-developed gonopophysis, *g*, that appears as a pale flattened blade, tip obtuse, on margin at near three-fourths the length with a strong appressed blackened spine, this slightly longer and more slender than the spine of the dististyle; aedeagus, *a*, long and slender, tip acute.

Holotype, male, Freshwater Lake, Dominica, 5–8 November 1966 (Gurney). Allotopotype, female. Paratopotype, female.

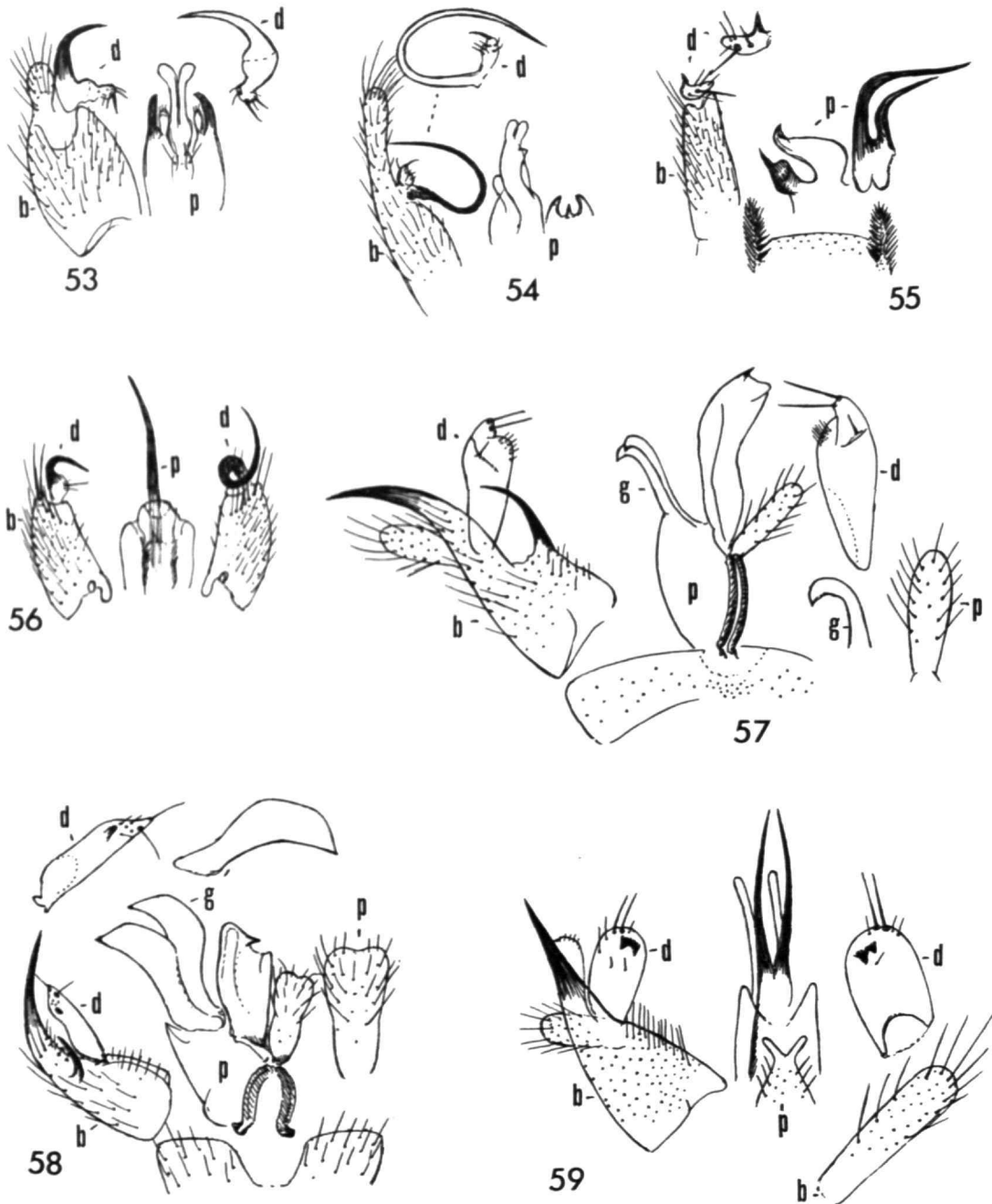
The most similar species is *Gonomyia* (*Lipophleps*) *puella* (Williston), discussed later in this paper. The details of structure of the dististyle and phallosome are quite distinct in the 2 species. In the Neotropical fauna there are numerous members of the subgenus that have the dististyle terminal, as in the present fly, virtually all of these having the style pale, subglobular to suboval, without blackened points but with the 2 fasciculate setae. Such species include *G. (L.) arajuno* Alexander, 1945 (Ecuador); *G. (L.) bifligera* Alexander, 1932 (Puerto Rico), *G. (L.) calverti* Alexander, 1914 (Costa Rica); *G. (L.) cubana* Alexander, 1931 (Cuba), *G. (L.) duurvoorti* Alexander, 1928 (Surinam), *G. (L.) haploa* Alexander, 1926 (Mexico), *G. (L.) haploides* Alexander, 1938 (Mexico), *G. (L.) inermis* Alexander, 1914 (British Guiana), *G. (L.) leonura* Alexander, 1941 (Ecuador), *G. (L.) maya* Alexander, 1927 (Mexico), *G. (L.) melancantha* Alexander, 1954 (Brazil), *G. (L.) minutistyla* Alexander, 1969 (Lesser Antilles: Grenada), *G. (L.) orthomeroides* Alexander, 1939 (Mexico), *G. (L.) parinermis* Alexander, 1940 (Venezuela), *G. (L.) phoroctenia* Alexander, 1921 (Peru), *G. (L.) prolongata* Alexander, 1940 (Venezuela), *G. (L.) scelerata* Alexander, 1945 (Peru), *G. (L.) subinermis* Alexander, 1939 (Mexico), and some others. All such species differ from one another chiefly in characters of the male hypopygium.

#### *Gonomyia* (*Lipophleps*) *bicornuta* Alexander, 1927

##### FIGURE 53

*Gonomyia* (*Lipophleps*) *bicornuta* Alexander, 1927b, pp. 276–277.—1932, p. 372, fig. 22.

Type from the Luquillo National Forest, Puerto Rico, collected 10–13 May 1927. Male hypopygium (Figure 53).



FIGURES 53-59.—Male hypopygium: 53, *Gonomyia (Lipophleps) bicornuta* Alexander; 54, *Gonomyia (Lipophleps) producta* Alexander; 55, *Gonomyia (Lipophleps) puella* (Williston); 56, *Gonomyia (Lipophleps) puer* Alexander; 57, *Gonomyia (Paralipophleps) cultriformis*, new species; 58, *Gonomyia (Paralipophleps) dikopis*, new species; 59, *Gonomyia (Paralipophleps) wirthiana*, new species. [SYMBOLS: *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *p*, phallosome.]

DOMINICA.—Clarke Hall, 8–10 January 1965, light trap (Wirth), 6–8 October 1966 (Gurney).

***Gonomyia (Lipophleps) producta* Alexander, 1919**

FIGURE 54

*Gonomyia (Leiponeura) producta* Alexander, 1919a, pp. 139–140.

Type from Blubber Valley, Antigua, Lesser Antilles, collected in March 1908. The species has a wide range in tropical America from Puerto Rico and Mexico south to Ecuador. Male hypopygium (Figure 54).

DOMINICA.—Cabrit Swamp, 23 February 1965, light trap (Wirth). Clarke Hall, 8–31 January, 1–28 February, 1–20 March 1965 (Wirth). 6–17 October 1966 (Gurney). D'leau Gommier, 16 March 1965 (Wirth). Mouth of Layou River, 15–20 January 1965 (Wirth).

***Gonomyia (Lipophleps) puella* (Williston), 1896**

FIGURE 55

*Atarba puella* Williston, 1896, pp. 288–289, fig. 60.  
*Gonomyia (Lipophleps) puella*.—Alexander, 1947a, p. 95, fig. 28.

Types were from Saint Vincent, Lesser Antilles, collected by H. H. Smith. Male hypopygium (Figure 55).

DOMINICA.—Clarke Hall, 11–28 February 1965, light trap (Wirth). D'leau Gommier, 16–17 March 1965 (Wirth). 804.7 m (0.5 mile) west of Pt. Lolo, 25 January 1965, at light (Wirth). 2,414 m (1.5 miles) west of Pont Casse, 3 April 1965 (Davis), 2,736 m (1.7 miles) east of Pont Casse, 24 March 1965 (Wirth), 4,828 (3 miles) east of Pont Casse, 13–16 October 1966 (Gurney).

***Gonomyia (Lipophleps) puer* Alexander, 1913**

FIGURE 56

*Gonomyia (Leiponeura) puer* Alexander, 1913a, p. 506, fig. 14.

Types from Hispaniola (Santo Domingo), in United States National Museum; no. 14,932. The species has a vast range in tropical and subtropical America, from the District of Columbia southward on the mainland to British Guiana, Ecuador, and Peru. There is a surprising variation in the size and structure of the dististyle of the hypopygium but it appears that a single

species is involved. In the present materials the style is relatively short and stout, only about one-half the size of certain other specimens. In all cases the dististyles of the two sides are terminal in position and are markedly asymmetrical (Figure 56).

DOMINICA.—Cabrit Swamp, 23 February 1965, light trap (Wirth). Clarke Hall, 21–31 January, 1–10 February 1965 (Wirth). Pt. Lolo, 804.7 m (0.5 mile) west, 25 January 1965, at light (Wirth).

**Subgenus *Neolipophleps* Alexander**

***Gonomyia (Neolipophleps) helophila* Alexander, 1916**

FIGURE 46

*Gonomyia (Leiponeura) helophila* Alexander, 1916b, pp. 343–346, figs. 1, 3.  
*Gonomyia (Neolipophleps) helophila* Alexander, 1947a, p. 99.  
? *Elliptera* sp., Williston, 1896, p. 290, fig. 64.

Types from Lima, Peru, taken in August 1914 by H. S. Parish. Widespread in tropical America, from the southwestern United States to Peru. It had not been recorded previously from the Antilles unless the record by Williston from Saint Vincent, above cited, pertains to this species. This certainly belongs to the present subgenus but may be found to belong to still another of the various regional species. Venation (Figure 46).

DOMINICA.—Clarke Hall, 21–31 January, 1–28 February, 1–31 March 1965, light trap (Wirth). Mouth of Layou River, 15–20 January, 6 February 1965 (Wirth).

**Subgenus *Paralipophleps* Alexander**

***Gonomyia (Paralipophleps) cultriformis*, new species**

FIGURE 57

Coloration of body and wings as in the subgenus; male hypopygium with bastistyle unequally bispinous; dististyle relatively narrow, fasciculate setae nearly terminal, below these with a group of small darker setae; phallosome with gonapophysis relatively slender, tip slightly dilated and recurved; ventral plate elongate-oval, apex obtuse, without lobes or spines.

MALE.—Length about 5.5–6 mm; wing 3.3–4 mm.

FEMALE.—Length about 6.5 mm; wing 4 mm.

Rostrum and palpi black. Antennae with scape and the enlarged pedicel yellow above, more darkened be-



low; proximal 2 flagellar segments yellow, the outer ones brown; flagellar segments 3 to 7 with exceedingly long verticils that are six or more times the length of the segments, as common in the subgenus, verticils of remaining segments abruptly shorter, subequal to the segments. Head light yellow, posterior vertex with a brown discal area.

Pronotum, pretergites and narrow lateral border of praescutum light yellow, the last bordered internally by a dark brown line, remainder of praescutum and scutal lobes light cinnamon brown; median region of scutum and most of scutellum obscure yellow, the latter on posterior border and as a central area narrowly brown; mediotergite yellow, base restrictedly patterned with brownish black. Pleura and pleurotergite conspicuously striped with very pale yellow or yellowish white, bordered both above and below by brownish black to form subequal stripes. Halteres with stem weakly darkened, knob slightly infuscated. Legs with fore coxae light yellow at bases, comprising the anterior end of the pleural stripe, apex blackened, being part of the pleural darkening; midcoxae yellow, base narrowly blackened, hind coxae uniformly yellow, all trochanters more obscure yellow; femora brownish yellow with a vague brown nearly terminal ring, extreme tip pale; tibiae and tarsi light brown. Wings very weakly darkened, prearcular and costal fields more yellowed; stigma short-oval, dark brown, with pale areas before and beyond and less evidently on either side of the cord; veins light brown, cord darker brown, anterior branch of *Rs* slightly darker and more apparent against the ground than in *Gonomyia (Paralipophleps) wirthiana*. Venation: *Sc*<sub>1</sub> ending a distance before origin of *Rs* about equal to two-thirds to three-fourths of this vein; *m-cu* at or shortly before fork of *M*.

Abdominal tergites obscure yellow, posterior and lateral borders blackened, median region weakly infuscated; sternites, base of hypopygium, and much of the basistyle yellowed. Male hypopygium (Figure 57) with the basistyle, *b*, bispinous, including a large stout outer spine and a slender curved inner one; fleshy lobe very pale, with long setae. Dististyle, *d*, relatively narrow, the fasciculate setae nearly terminal, below these with a group of small darkened setae. Phallosome, *p*, with gonapophysis, *g*, relatively narrow, tip dilated and recurved; aedeagus longer, relatively narrow; ventral plate elongate-oval, with long setae but without terminal lobes or spines, apex obtuse, in cases slightly more narrowed and darkened.

Holotype, male, Clarke Hall, Dominica, 11–20 February 1965 (Wirth). Paratopotypes several males, 8 January–31 March 1965 (Wirth), 13–17 October 1966 (Gurney). A further broken female is considered to belong here but may pertain to one or another of the other regional members of the subgenus, since it was not found associated with the male.

Other members of the subgenus having 2 apical spines include *Gonomyia (Paralipophleps) diplacantha* Alexander, *G. (P.) latistyla* Alexander, and *G. (P.) pleuralis* (Williston), all having the details of the phallosome quite distinct, particularly the ventral plate and gonapophyses. Other species have the apex of the ventral plate with 2 points or lobes and the gonapophyses terminating in acute spines, not cultriform as in the present fly. *G. (P.) dikopsis*, new species, similarly falls in this general group but has the hypopygial details even more distinct. It should be noted that the species determined as being *G. (P.) pleuralis* still remains not fully settled since the type cannot be located in any of the various collections where the Williston 1896 materials have been preserved. What has been identified as this over the past several years is the commonest and best known member of the subgenus, with a vast range in the Americas, from Georgia, Florida, and the Bahamas south to Bolivia. The immature stages were described by Rogers and the male hypopygium by the writer (Alexander, 1964a, p. 79, fig. 87). I believe that the name *G. (P.) pleuralis* should be restricted to this species.

#### *Gonomyia (Paralipophleps) dikopsis*, new species

FIGURE 58

MALE.—Length about 4.5 mm; wing 3.8 mm.

FEMALE.—Length about 5.3–5.5 mm; wing 3.8–4 mm.

General coloration of body and appendages as in *Gonomyia (Paralipophleps) pleuralis* and related species. Flagellar verticils of the male excessively long, the longest exceeding one-half the entire antenna. Thorax with dorsal dark pleural stripe broad, divided by a paler line. Legs with femora brown, more yellowed basally, darker near tip, the extreme genua whitened; tibiae and tarsi light brown.

Male hypopygium (Figure 58) with basistyle, *b*, narrowed outwardly and extended into a long slender spine, with a smaller spine near its base; fleshy lobe long. Dististyle, *d*, relatively narrow, outer end ter-

minating in a fasciculate seta, the 2nd usual bristle erect, removed a short distance from the tip, face of style with a small darkened area. Phallosome, *p*, quite distinct from other species, especially in the broadly flattened gonapophyses and the broad depressed-flattened ventral plate, its apex shallowly emarginate.

Holotype, male, Trafalgar Falls, Dominica, 365.7 m (1,200 ft), 5–6 April 1966 (Gagné). Allotopotype, female. Paratopotype, 1 broken male, abdomen lacking. Paratypes, South Chiltern, 18–19 August 1965 (Jackson). Springfield, November 1967 (Krauss).

The only other regional member of the subgenus with the phallosomic ventral plate unarmed is *Gonomyia (Paralipophleps) cultriformis*, new species, readily told by various details of structure of the male hypopygium, as discussed and keyed elsewhere in the present paper.

*Gonomyia (Paralipophleps) wirthiana*, new species

FIGURES 47, 59

General coloration of body and wings as in the subgenus, thoracic pleura conspicuously striped longitudinally with dark brown and white; male hypopygium with outer apical angle of basistyle produced into a flattened blade, with a fleshy lobe at its base; dististyle a broadly flattened pale plate, apex nearly truncate, with a blackened bidentate area; phallosome with 2 pairs of elongate rods, tips of one pair acute, of the other obtuse.

MALE.—Length about 5.5–6 mm; wing 3.5–4 mm.

FEMALE.—Length about 5.5–6 mm; wing 4–4.2 mm.

Rostrum and palpi black. Antennae with scape, pedicel, and proximal 2 flagellar segments orange yellow, remainder dark brown to black; outer flagellar segments long-cylindrical, verticils of the 3rd and succeeding 5 or 6 segments exceedingly long, about one-third the entire flagellum, of the outer segments shorter but still longer than the segments. Head very pale yellow, center of vertex weakly darkened.

Pronotum china white, including also the pretergites and narrow lateral praescutal margins, the latter extended posteriorly across the wing base to include the dorsal pleurotergite and lateral parts of the mediotergite. Mesonotal praescutum light chestnut brown, patterned with slightly darker brown, including a central stripe and narrower sublateral lines adjoining the whitened margins; scutum with lobes chestnut brown, lateral mesal borders dark brown, central region yellow

with a vague central darkening; scutellum yellow, very narrowly bordered posteriorly by dark brown, variegated as indicated above. Pleura with the ground dark brown, appearing as 2 narrow longitudinal stripes that enclose a slightly broader china white ventral line; more dorsally below the wing root with a slightly separated brown line that includes the propleura, the 2 darkened stripes enclosing a slightly paler brownish yellow line. Halteres yellow, base of stem infuscated, apex of knob yellowed. Legs with coxae whitened, apex of fore pair and base of middle dark brown, being included in the ventral dark brown pleural stripe; trochanters yellow; femora yellow, with a narrow subterminal brown ring, the narrow tip pale; tibiae and tarsi brown. Wings (Figure 47) light brown, prearcular and costal fields clear light yellow, more expanded surrounding the dark brown stigma, including all of cell  $R_1$  and along vein *C* virtually to wing tip; very narrow and vague darkenings over cord and outer end of cell 1st  $M_2$ , best indicated by a darkening of the veins; remaining veins yellowed, trichia black, very short and relatively sparse, including vein  $R_5$ , all outer medial branches and outer end of  $Cu_1$ . Venation:  $Sc_1$  ending just before origin of  $R_5$ , anterior branch of the latter strongly upcurved, very pale and difficult to see against the ground; veins  $R_5$  and  $M_{1,2}$  convergent outwardly, strongly narrowing cell  $R_5$ ; *m-cu* close to fork of *M*.

Abdominal tergites obscure yellow, posterior borders narrowly brownish black, median area with a much paler brown longitudinal line; sternites yellowed medially, light brown on sides and along posterior border; 9th tergite light yellow, remainder of hypopygium slightly darker yellow. Male hypopygium (Figure 59) with outer lateral angle of basistyle, *b*, produced into a flattened blade that terminates in an acute spine, at its base with an additional nearly apical fleshy lobe with very long setae. Dististyle, *d*, a broadly flattened pale plate, apex very obtuse to nearly truncate, bearing a slightly bidentate blackened area, the 2 modified setae at outer edge of this area. Phallosome, *p*, including 2 long acute spines and 2 longer narrow pale rods, their tips obtuse; ventral plate terminating in 2 small divergent arms.

Holotype, male, Clarke Hall, Dominica, 1–10 February 1965 (Wirth). Allotopotype, female, 21–28 February 1965 (Wirth). Paratopotypes, numerous males and females, 8 January–20 March 1965 (Wirth), 13–17 October 1966 (Gurney). Paratypes, males,

Antrim, 304.8 m (1,000 ft), 11–20 March 1956 (Clarke).

I take unusual pleasure in naming this distinct fly for Dr. Willis W. Wirth, distinguished student of the Diptera, to whom much of our knowledge of Dominican flies is due. The species is readily told from other regional members of the subgenus by the conformation of the dististyle of the hypopygium.

### *Eriopterodes*, new genus

Antennae short; pedicel enlarged-oval, proximal 2 flagellar segments short and crowded, closely approximated to partially fused, the suture indicated; succeeding segments progressively more elongate outwardly, with very long verticils, the longest exceeding twice the length of the segments; outer 3 segments very long, without verticils, the preceding one with a single such seta. Legs with trochanters, femora, tibiae, and proximal ends of basitarsi with abundant to dense elongate scales, outer segments with normal setae; claws very small. Wings (Figure 63) in the genotype, *celestis*, with trichia of veins unusually stout, from microscopic punctures, tips obtuse, in *laetipleura* the scales long and of normal thickness. Venation: Cord at near mid-length of wing; cell  $M_2$  open by atrophy of  $m$ ;  $m-cu$  at or beyond fork of  $M$ ; vein 2nd  $A$  only slightly sinuous, terminating opposite or before  $m-cu$ . Male hypopygium not inverted, the tergite dorsal in position, its median area produced into a broad lobe. Basistyle without lobes or modifications. Dististyles 2, terminal, both simple, long and slender; outer style nearly straight, at apex with 2 divergent teeth; inner style virtually as long, curved gently to the obtuse tip. Phallosome unusually simple, including the long slender aedeagus, its base broader, outwardly narrowed to the acute tip; gonapophysis simple, pale, bladelike, tip obtuse, base dilated.

GENOTYPE.—*Erioptera* (*Erioptera*) *celestis* (Alexander), 1940, page 294. Ecuador and Venezuela. I consider the materials in the present series from Dominica to represent an undescribed subspecies, *Eriopterodes celestis dominicana*, new subspecies. The Mexican *E. laetipleura* (Alexander) with unpatterned wings, likewise belongs here.

The hypopygial feature of a simple aedeagus separates the present group from *Erioptera* Meigen and its various subgenera, which have the apex of the aedeagus bifurcate. Certain other groups earlier associated with *Erioptera*, such as *Arctoconopa* Alexander, now are

believed to represent entirely distinct genera. The long slender aedeagus of *Eriopterodes* is suggestive of the condition found in the genus *Molophilus* Curtis, particularly in the subgenus *Promolophilus* Alexander, where the structure is unusually short but stout.

### *Eriopterodes celestis dominicana*, new subspecies

#### FIGURE 63

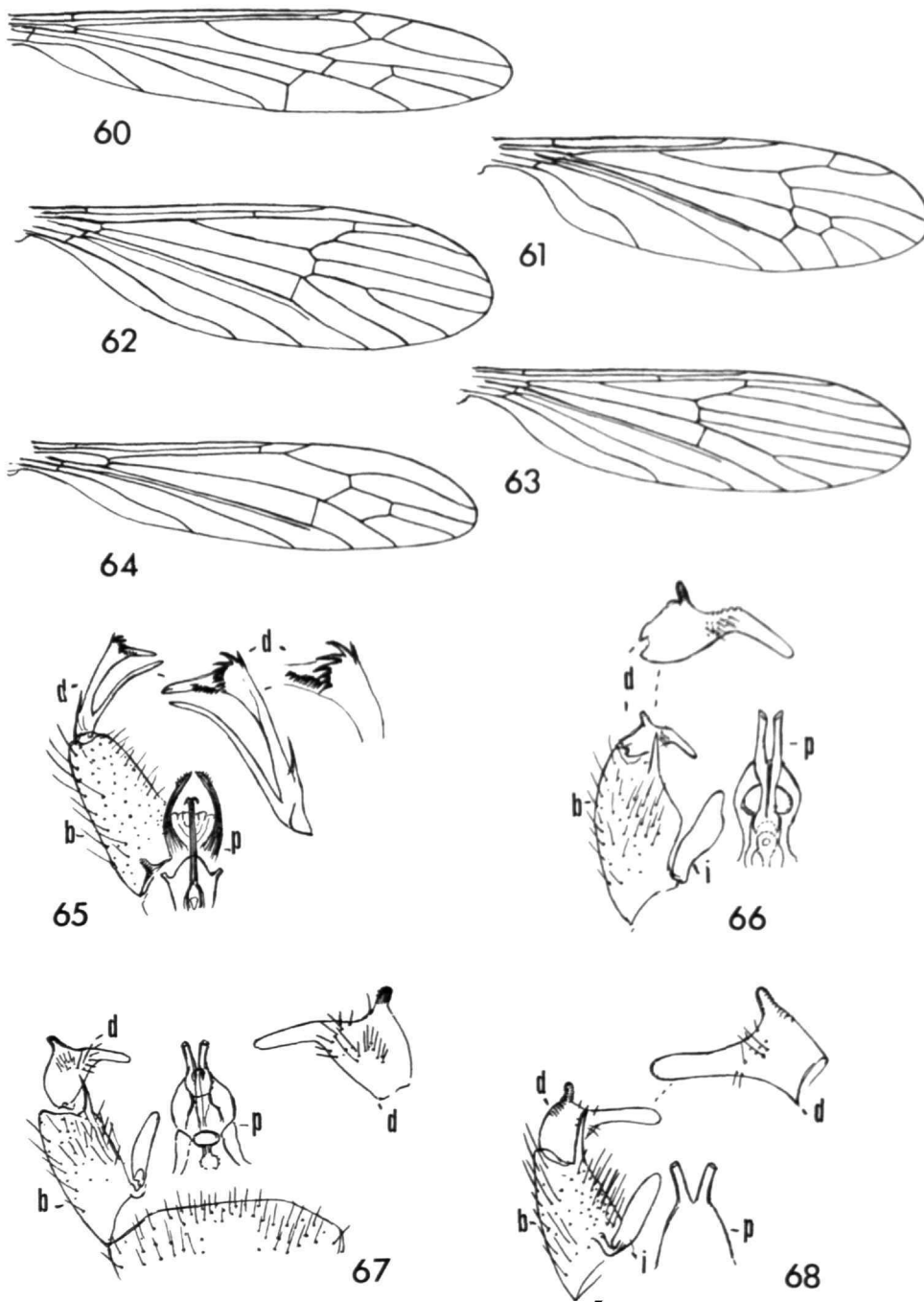
Thorax with anterior end of praescutum orange, posterior sclerites darker, pleura brownish black with a conspicuous yellow longitudinal stripe; femora blackened, the extreme tip paler; wings strongly darkened, costal border broadly yellow, with 4 brown areas that are subequal to or more extensive than their interspaces; marginal spots at ends of longitudinal veins large and diffuse.

MALE.—Length about 3.2–3.5 mm; wing 3.5–4 mm; antenna about 0.65–0.8 mm.

FEMALE.—Length about 3.5–4 mm; wing 4–4.2 mm.

Rostrum brown, palpi black. Antennae with scape and pedicel obscure yellow to light brown, flagellum brownish black, the segments with long verticils, as discussed under the genus. Vertex dark brown, orbits more pruinose.

Pronotum brownish black, representing the anterior end of the dorsal pleural stripe. Mesonotal praescutum with anterior half orange, with a capillary darkened central vitta, lateral borders more yellowed, behind the pseudosutural foveae light brown, the color continued across the suture to include the scutal lobes, median region vaguely yellowed; scutellum and mediotergite light brown, pleurotergite yellowed. Pleura very conspicuously patterned with 2 longitudinal brownish black stripes that are separated by a subequal yellow line that extends from the fore coxa to base of the posterior coxa. Halteres with stem light yellow, knob weakly darkened. Legs with coxae yellowed, fore pair brighter, as described; trochanters obscure yellow; femora blackened, the color accentuated by the abundant blackened scales, extreme tip paler; tibiae and basitarsi more yellowed, but appearing darker because of scales, outer tarsal segments yellowed. Wings (Figure 63) strongly darkened, prearcular and costal fields light yellow, the latter with 4 extensive brown areas that are subequal in extent to the yellow interspaces; a narrower and less conspicuous paler brown seam over cord and small pale brown spots at ends of longitudinal veins, excepting  $M_{1+2}$ ; cell 2nd  $A$  chiefly darkened; veins obscure



FIGURES 60–68.—Venation: 60, *Trentepohlia (Paramongoma) dominicana* Alexander; 61, *Rhabdomastix (Sacandaga) fumipennis* Alexander; 62, *Erioptera (Mesocyphona) gagneana*, new species; 63, *Eriopterodes celestis dominicana*, new subspecies; 64, *Toxorhina (Toxorhina) carunculata*, new species. Male hypopygium: 65, *Erioptera (Mesocyphona) gagneana*, new species; 66, *Toxorhina (Toxorhina) carunculata*, new species; 67, *Toxorhina (Toxorhina) polytricha*, new species; 68, *Toxorhina (Toxorhina) subfragilis*, new species. [SYMBOLS: *b* basistyle; *d*, dististyle; *i*, interbase; *p*, phallosome.]

yellow, slightly darker in the patterned parts. Longitudinal veins with yellowed setae in the ground sections, more brownish black and appearing slightly stouter in the markings, intensifying the pattern. Venation as in the genus.

Abdomen of male brownish black, 9th tergite and sternite yellowed, styli brownish black; in female genital segment light orange. Male hypopygium as discussed under the genus.

Holotype, male, 2,736 m (1.7 miles) east of Pont Casse, 12 March 1965, light trap (Wirth). Allotopotype, female, 13 March 1965 (Wirth). Paratopotypes, 2 males, with types, 10 March 1965; 2 females, 804.7 m (0.5 mile) east of Pont Casse, 27 January 1965, at light (Wirth), 8,046 m (5 miles) east of Pont Casse, 11 April 1966 (Gagné). Paratypes, both sexes, D'leau Gommier, 17 March 1956 (Clarke), Central Forest Reserve, 518 m (1,700 ft), 26 May 1966 (Gagné). Fond Figues River, 121.9 m (400 ft), 12, 29 April 1966 (Gagné), 13 March 1965 (Wirth). Freshwater Lake, 762 m (2,500 ft), 5 April 1966 (Gagné). Trail, 1,609 m (1 mile) north of junction of roads to Rosalie and Castle Bruce, 396 m (1,300 ft), 29 March 1966 (Gagné).

### Genus *Erioptera* Meigen

*Erioptera* Meigen, 1803, p. 262.—Alexander, 1947b, pp. 328–335.—Stone, et al., 1965, p. 80.

### Subgenus *Mesocyphona* Osten Sacken

Subgenus *Mesocyphona* Osten Sacken, 1869, p. 152.

### *Erioptera (Mesocyphona) caliptera* Say

*Erioptera caliptera* Say, 1823, p. 17; LeConte 1859, p. 44; *caloptera* of authors.

*Erioptera caloptera* Williston, 1896, p. 294.

*Erioptera (Mesocyphona) caloptera*.—Alexander, 1939b, p. 100; 1942, p. 457, fig. 52 I.

The species is widely distributed throughout the Nearctic region, ranging southward into tropical America. Williston (1896) had recorded it from Saint Vincent. It is known from Cuba and Puerto Rico and presumably is widespread in the Antillean islands.

DOMINICA.—Antrim, 304.8 m (1,000 ft), 11–20 March 1956 (Clarke). Boeri Lake, 22 February 1964 (Bray). Cabrit Swamp, 23 February 1965, light trap (Wirth). Clarke Hall, 8 January 1965 (Clarke), 8

January–28 February 1965 (Wirth), 1–20 March 1965 (Wirth), 6–13 April 1966 (Gagné), 6–10 October 1966 (Gurney). D'leau Gommier, 17 March 1956 (Clarke). Mouth of Layou River, 15–20 January 1965 (Wirth). Mt. Trois Pitons, 27 February 1964 (Bray), 1,609 m (1.0 mile) east of Pont Casse, 29 January 1965 (Wirth), 2,414 m (1.5 miles) north, 12 February 1965 (Wirth). Portsmouth, 2 March 1964 (Bray). Sylvania Estate, 548.6 m (1,800 ft), 29 August 1938 (Hodge), 9 February 1964 (Bray), in grassy marsh, 23–25 January 1965, light trap (Wirth).

### *Erioptera (Mesocyphona) gagneana*, new species

FIGURES 62, 65

Size small (wing about 3 mm); mesonotum chiefly dark brown, praescutum with a pale brown central stripe; pleura brownish black, with a silvery white longitudinal stripe; fore and middle femora dark brown, tips narrowly pale yellow, posterior femora obscure yellow with 2 brown rings, the subterminal one broader; wings weakly suffused with brown, unpatterned; male hypopygium with a single dististyle that bears 3 branches, the outer one a small slender basal spine, inner branch a long slender smooth rod, longest arm dilated at apex, extended into a long pale blade.

MALE.—Length about 2.8–3 mm; wing 2.7–3.2 mm; antenna about 0.5 mm.

FEMALE.—Length about 3 mm; wing 3 mm.

Rostrum and palpi black. Antennae with scape and the enlarged pedicel black, flagellum dark brown to brownish black. Head with anterior vertex yellow, posterior regions broadly dark brown.

Pronotum brown, patterned with darker, lateral borders narrowly light yellow. Mesonotal praescutum with an obscure pale brown central stripe, in cases with further less evident lateral areas, interspaces and outer margin darker brown; scutal lobes dark brown, central area and the scutellum paler brown; postnotum brownish black. Pleura brownish black with a broad silvery white longitudinal stripe, extending from the ventral sternopleurite caudad to beneath the halteres, slightly widened behind; dorsopleural region broadly whitened, midregion of sternites obscure yellow. Halteres pale yellow, knob weakly darkened. Legs with fore coxae and trochanters brownish black, mid-coxae and tro-

chanters slightly paler, posterior pair yellowed; fore and middle femora dark brown, slightly darker subterminally, tips narrowly and abruptly pale yellow; tibiae light brown, extreme base and tip yellowed; basitarsi weakly darkened, outer part and remainder of tarsi pale yellow; posterior femora obscure yellow with 2 brown rings, subterminal band broader, central annulus narrow and diffuse, posterior tibiae and tarsi as in the other legs. Wings (Figure 62) weakly suffused with brown, unpatterned, veins darker brown, trichia brownish black. Venation: Petiole of cell  $M_3$  subequal to or longer than  $m-cu$ .

Abdominal tergites brownish black, sternites and subterminal segment slightly paler, hypopygium black. Male hypopygium (Figure 65) with a single dististyle,  $d$ , that bears 3 branches, the major arm dilated on outer half, the end extended into a long pale blade, the dilated head with about 6 strong spines arranged in a transverse row at base of blade, with a further comb of about a dozen more slender spines placed longitudinally along the base; 2nd arm long and slender, smooth, placed on mesal margin close to base; 3rd branch or arm a microscopic spine on margin of style slightly distal of level of the inner arm.

Holotype, male, 2,736 m (1.7 miles) east of Pont Casse, 12 March 1965 (Wirth). Allotopotype, female, 1,609 m (1 mile) east of Pont Casse, 29 January 1965, at light (Wirth). Paratopotypes, both sexes, 27–29 January, 10–24 March 1965 (Wirth). Paratypes, both

sexes, Clarke Hall, 21–31 January 1965 (Wirth). Fond Figues River, 121.9 m (400 ft), 9 February, 13 March (Wirth), 12 April 1966 (Gagné). D'leau Gommier, 17 March 1956 (Clarke), 15 February, 16 March 1965 (Wirth). Manets Gutter, 1–10 March 1965, light (Wirth). 804.7 (0.5 mile) west of Pt. Lolo, 25 January 1965, at light (Wirth).

The species is named for Dr. Raymond J. Gagné, student of the Diptera, Entomology Research Division, United States Department of Agriculture.

There are numerous Neotropical species in the subgenus having unpatterned wings but relatively few with the leg pattern somewhat as in the present fly. All members of the subgenus are most readily separated by differences in hypopygial structure. The most similar species include *Erioptera* (*Mesocyphona*) *modica* Alexander, *E. (M.) troglodyta* Edwards, and *E. (M.) withycombei* Alexander.

#### Genus *Toxorhina* Loew

*Toxorhina* Loew, 1851, pp. 400–402, figs. 16–23.—Alexander, 1947b, pp. 356–360, figs. 30–32.

All members of the genus in Dominica are generally similar and closely allied, differing from one another chiefly in coloration of the wings and legs, trichiation of the wing veins, and in relatively slight details of hypopygial structure.

#### Key to Species of *Toxorhina*

1. Wings strongly suffused with brown; (wing veins beyond cord without trichia, vein  $R_1$  with about 10) ..... *T. fumipennis* Alexander  
Wings paler, subhyaline or only weakly tinted ..... 2
2. Legs with tips of tibiae narrowly blackened; male hypopygium with arms of aedeagus elongate, longer than the dististyle; (wing veins unusually glabrous, without trichia on  $R_5$  and about 2 on  $R_1$ ) ..... *T. stenophallus* Alexander  
Legs with tibiae uniformly light brown ..... 3
3. Wings (Figure 64) with trichia of veins more abundant, including  $R_5$  and virtually complete series on  $R_1$ ,  $R_5$ , and distal sections  $M_{1+2}$  and  $M_3$ ; male hypopygium (Figure 66) with apex of dististyle narrowly obtuse to subacute, outer margin of blade at base with low blunt tubercles ..... *T. corunculata*, new species  
Trichia of outer wing veins very sparse,  $R_1$  with a complete series,  $R_5$  and  $M_{1+2}$  with few at outer ends; male hypopygium (Figures 67, 68) with apex of dististyle more broadly obtuse, the blade without distinct tubercles ..... 4
4. Mesonotal praescutum with pale brown stripes; hypopygium (Figure 67) with major setae of blade of dististyle numerous, to about 10 in total ..... *T. polytricha*, new species  
Mesonotal praescutum dark brown; hypopygium (Figure 68) with major setae of blade of dististyle few in number, 10 or less ..... *T. subfragilis*, new species

*Toxorhina (Toxorhina) carunculata*, new species

FIGURES 64, 66

General coloration of thorax darkened, pleura yellowed ventrally, above with a narrow dark brown longitudinal stripe; rostrum longer than wing; legs brownish yellow, with abundant darker bifid setae, tips of tibiae not blackened; wing subhyaline, outer veins with trichia, including extensive series on  $R_5$ ,  $R_6$ , and distal sections of  $M_{1+2}$  and  $M_3$ ; male hypopygium with a spine on basistyle; dististyle with several low tubercles on outer margin at base of the prolongation; arms of phallosome relatively long, more than five times their diameter across base.

**MALE.**—Length, excluding rostrum, about 7–7.5 mm; wing 5–5.8 mm; rostrum about 6.5–7 mm.

Rostrum dark brown, longer than the wing and only a little shorter than remainder of body. Antennae dark brown. Head light brownish gray; anterior vertex relatively narrow, about one-half greater than the diameter of the scape.

Cervical region and pronotum dark brown. Mesonotal praescutum with disk darkened, including 3 faintly differentiated dark brown stripes and slightly paler interspaces, lateral borders more yellowed; scutal lobes similarly dark brown, central region and posterior borders of lobes paler; scutellum and mediotergite brown, light gray pruinose. Pleura with a narrow dark brown dorsal stripe extending from the cervical region to the halteres, more diffuse behind, ventral pleurites yellowed, broadly clear light yellow beneath. Halteres weakly infuscated. Legs with coxae and trochanters yellowed, anterior face of fore coxa weakly darkened; remainder of legs brownish yellow, appearing darker brown because of the abundant bifid darkened setae; tips of tibiae not darkened. Wings (Figure 64) subhyaline, veins and trichia darker brown. Trichia of veins beyond cord unusually abundant, including extensive series on  $R_5$ ,  $R_6$ , and distal sections of  $M_{1+2}$  and  $M_3$  except on their bases. Venation:  $Sc_1$  ending nearly opposite origin of  $R_5$ , about one-third to one-half  $R_{1+2}$ ;  $m-cu$  shortly before fork of  $M$ .

Abdominal tergites almost uniformly dark brown, sternites slightly more yellowed, apices of tergites very narrowly darker; hypopygium brown. Male hypopygium (Figure 66) with basistyle,  $b$ , bearing a long pale nearly terminal spine or narrow blade; setae of mesal face of style numerous, long and slender. Interbase,  $i$ , a flattened pale blade. Dististyle,  $d$ , with basal

lobe long, the outer end farther produced into a slender darkened lobule that is microscopically roughened; outer blade of style long and pale, outer margin near base with several pale tubercles, lower face of prolongation with numerous setae. Phallosome,  $p$ , with arms parallel, relatively long and slender, the length of either arm more than five times the diameter at base, tip obtuse, not prolonged into a hairlike point as in *domingensis*.

Holotype, male, Cabrit Swamp, Dominica, 23 February 1965, light trap (Wirth). Paratypes, 2 males, Clarke Hall, 11–20 February, light trap, 21–31 March 1965 (Wirth). A further broken specimen from 804.7 m (0.5 mile) east of Pont Casse, 27 January 1965, collected by Wirth, apparently belongs here.

Species from the Greater Antilles and the Bahamas include the genotype, *Toxorhina (Toxorhina) fragilis* Loew, of Puerto Rico, *T. (T.) domingensis* Alexander, of Hispaniola, and the very distinct *T. (T.) jamaicensis* Alexander, Jamaica, *T. (T.) violaceipennis* Alexander, Cuba, and *T. (T.) distalis* Alexander, Bahamas. Of the various species herein recorded from Dominica, all appear to be closely interrelated and may be separated by the characters given in the key.

*Toxorhina (Toxorhina) fumipennis* Alexander, 1939*Toxorhina (Toxorhina) fumipennis* Alexander, 1939b, p. 100.

The type female was from the Sylvania Estate, Dominica, 548.6 m (1,800 ft), 29 August 1938, collected by Hodge. In the original description erroneously recorded as a male. It is most readily distinguished from the other regional species by the markedly infumed wings.

*Toxorhina (Toxorhina) polytricha*, new species

FIGURE 67

Size small (wing of male to 4 mm); rostrum subequal in length to remainder of body; mesonotal praescutum with 4 light brown stripes, lateral borders broadly yellow; pleura yellow with a narrow dark brown dorsal stripe; wings weakly darkened, with sparse trichia on  $R_5$  and near outer ends of veins  $R_6$  and  $M_{1+2}$ ; male hypopygium with spine of basistyle slender, tip acute; dististyle with about 20 major setae on disk; arms of phallosome relatively short, separated by a distance subequal to their diameter.

MALE.—Length, excluding rostrum, about 4.5 mm; wing 3.5–4 mm; rostrum about 4.5 mm.

FEMALE.—Length, excluding rostrum, about 5.5–6 mm; wing 4–4.5 mm; rostrum about 4 mm.

Rostrum brownish black, in male subequal in length to remainder of body. Antennae with scape and pedicel dark brown, flagellum brownish black. Head gray; anterior vertex about twice the diameter of scape.

Cervical region brownish black. Pronotum brownish yellow. Mesonotal praescutum with 4 light brown stripes, the intermediate pair becoming obsolete behind, interspaces brownish yellow, humeral and lateral regions light yellow, posterior sclerites of notum dark brown. Pleura light yellow, with a narrow brown dorsal stripe. Halteres with stem obscure yellow, knob brown. Legs with all coxae and trochanters light yellow; remainder of legs light brown. Wings weakly darkened, prearcular field more yellowed; veins brown. Sparse trichia on outer ends of veins  $R_5$  and  $M_{1+2}$ , with still fewer on  $R_5$ .

Abdomen with tergites light brown, more brightened laterally, subterminal segments slightly darker to form a narrow ring; sternites and hypopygium yellow. Male hypopygium (Figure 67) with spine of basistyle,  $b$ , slender, tip acute. Dististyle,  $d$ , with apex of blade obtuse; disk below the darkened tubercle with unusually abundant major setae, to about 20 in number, the more basal ones paler, long and slender. Phallosome,  $p$ , with arms relatively short, separated by a space subequal to their own diameter.

Holotype, male, 321.8 m (0.2 mile) east of Pont Casse, Dominica, 8 April 1966 (Gagné). Allotype, female, Fond Figs River, 13 March 1965, light trap (Wirth). Paratopotypes, 4 males and females, 4,828 m (3 miles) east of Pont Casse, 13–16 October 1966 (Gurney). Paratypes, female, Clarke Hall, 21–31 January 1965, at light (Wirth). Fond Figs River, 13 March 1965 (Wirth). G'leau Gommier, 17 March 1956 (Clarke).

The most similar species are *Toxorhina* (*Toxorhina*) *carunculata*, new species, and *T. (T.) subfragilis*, new species most readily separated by the characters provided in the key.

*Toxorhina* (*Toxorhina*) *stenophallus* Alexander, 1937

*Toxorhina* (*Toxorhina*) *stenophallus* Alexander, 1937b, pp. 503–504.

The type was from Rio Grande do Sul, Brazil, known also from Panama and Venezuela.

DOMINICA.—Clarke Hall, 12–17 November 1964 (Spangler); 11–20 January 1965, in Malaise trap (Wirth), 1–20 February 1965, light trap (Wirth). Pont Casse, 22 November 1964 (Spangler).

*Toxorhina* (*Toxorhina*) *subfragilis*, new species

FIGURE 68

Mesonotal praescutum with 3 virtually confluent brown stripes, sides broadly yellow; pleura yellow with a brown dorsal stripe; wings faintly tinged with brown, prearcular field slightly more yellowed; abdominal tergites uniformly dark brown, basal sternites brownish yellow, hypopygium yellowed; male hypopygium with spine of basistyle slender; dististyle with outer blade a flattened pale paddle, apex obtuse, base with a relatively slender darkened lobe, face of style with only about 4 major setae.

MALE.—Length, excluding rostrum, about 5.5 mm; wing 5 mm; rostrum about 4 mm.

FEMALE.—Length, excluding rostrum, about 5.5 mm; wing 4 mm; rostrum about 3.5 mm.

Rostrum shorter than wing, brownish black. Antennae with scape brown, pedicel brownish yellow, flagellum black. Head light brown; anterior vertex nearly three times the diameter of scape.

Cervical region black. Mesonotal praescutum with 3 virtually confluent brown stripes, the central one darker anteriorly, sides broadly yellow; scutal lobes blackened; posterior notal sclerites brown, gray pruinose. In the allotype the praescutum and scutal lobes are paler brown. Pleura with a diffuse dark brown dorsal stripe, ventral pleurites abruptly light yellow, especially the sternopleurite and meron. Halteres dark brown. Legs with all coxae and trochanters light yellow; remainder of legs light brown, the outer tarsal segments darker. Wings faintly tinged with brown, prearcular field slightly more yellowed; veins brown. Venation:  $Sc_1$  ending about opposite origin of  $R_5$ ;  $m-cu$  at or close to fork of  $M$ .

Abdominal tergites uniformly dark brown, basal sternites brownish yellow, hypopygium yellowed. Male hypopygium (Figure 68) with spine of basistyle pale, long and slender. Dististyle,  $d$ , with blade a flattened pale paddle, apex obtuse, outer margin near base with a relatively slender, darkened, slightly roughened lobe; face of style with major setae reduced in number to about 4. Phallosome,  $p$ , with arms relatively long and narrow, the intervening space broader.



Holotype, male, Freshwater Lake, Dominica, 6 March 1965 (Wirth). Allotype, female, Fond Figues River, 13 March 1965, light trap (Wirth).

The single most similar regional species is *Toxorhina* (*Toxorhina*) *carunculata*, new species, which differs chiefly in slight details of the hypopygium, including the dististyle. This has the blade pale and narrow, with the apex subacute, and with numerous setae at base of style.

### Literature Cited

Alexander, Charles P.

1911. Notes on Two Tipulidae (Dipt.). *Entomological News*, 22: 349-354, 4 figures.
- 1912a. New Species of *Furcomya* (Tipulidae). *The Canadian Entomologist*, 44: 333-342, 1 plate with 16 figures.
- 1912b. New Neotropical Tipulinae (Tipulidae, Dipt.). *Annals of the Entomological Society of America*, 5: 343-365, 23 figures.
- 1913a. A Synopsis of Part of the Neotropical Crane-flies of the Subfamily Limnobiinae. *Proceedings of the United States National Museum*, 44: 481-549, plates 65-68 with 42 figures.
- 1913b. The Neotropical Tipulidae in the Hungarian National Museum (Diptera).—I. *Entomological News*, 24: 404-412, 1 plate with 10 figures.
1914. On a Collection of Crane-flies from British Guiana (Tipulidae, Diptera). *Transactions of the American Entomological Society*, 40: 223-255, 2 plates with 20 figures.
- 1916a. New or Little-known Crane-flies from the United States and Canada: Tipulidae, Ptychopteridae; Diptera. Part 3. *Proceedings of the Academy of Natural Sciences of Philadelphia* for 1916: 486-549, 7 plates with 98 figures.
- 1916b. New Species of Crane-flies from the West Indies (Tipulidae, Dip.). *Entomological News*, 27: 343-347, 6 figures.
- 1916c. New or Little-known Crane-flies from Colombia, Ecuador and Peru (Tipulidae, Diptera). *Transactions of the American Entomological Society*, 42: 1-32, 5 plates with 43 figures.
- 1919a. Records and Descriptions of Neotropical Crane-flies (Tipulidae, Diptera) I. *Journal of the New York Entomological Society*, 27: 132-154, plate 17 with 16 figures.
- 1919b. The Crane-flies of New York. Part I. Distribution and Taxonomy of the Adult Flies. *Cornell University Agricultural Experiment Station: Memoir* 25: 765-993, text figures 121-131, plates 30-45 with 354 figures.
- 1920a. The Crane-flies of New York. Part II. Biology and Phylogeny. *Cornell University Agricultural Experiment Station: Memoir* 38: 691-1133, portrait, plates 12-97 with 539 figures.
- 1920b. New or Little-known Crane-flies from Tropical America (Tipulidae, Diptera). *The Canadian Entomologist*, 52: 141-144.
1921. New or Little-known Crane-flies from the Amazonian Region. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 1: 39-103, 12 figures.
1922. Undescribed Species of Costa Rican Flies Belonging to the Family Tipulidae in the United States National Museum. *Proceedings of the United States National Museum*, 60(25): 1-7.
- 1927a. New or Little-known Crane-flies. Part II. *Encyclopedie Entomologique, Diptera*, 4: 17-27.
- 1927b. Records and Descriptions of Neotropical Crane-flies (Tipulidae, Diptera), III. *Journal of the New York Entomological Society*, 35: 265-278.
- 1928a. Studies on the Crane-flies of Mexico. Part IV. (Order Diptera, Superfamily Tipuloidea). *Annals of the Entomological Society of America*, 21: 101-119.
- 1928b. Records and Descriptions of Neotropical Crane-flies (Tipulidae, Diptera), IV. *Journal of the New York Entomological Society*, 36: 47-59.
- 1929a. New or Little-known Tipulidae from the Philippines (Diptera), V. *The Philippine Journal of Science*, 40(2): 239-273, plate 1 with 18 figures.
- 1929b. *Diptera of Patagonia and South Chile. Based Mainly on Material in the British Museum (Natural History). Part I—Crane-flies.* i-xvi, 1-240, 3 text figures, 12 plates with 259 figures.
1930. Records and Descriptions of Neotropical Crane-flies (Tipulidae, Diptera), VIII. *Journal of the New York Entomological Society*, 38: 109-120.
1932. The Crane-flies of Puerto Rico (Diptera). *The Journal of Agriculture of Puerto Rico*, 16(4): 347-387, plates 43-48 with 26 figures.
- 1937a. New or Little-known Species of West Indian Tipulidae (Diptera). II. *The Journal of Agriculture of the University of Puerto Rico*, 21(2): 179-190, 11 figures.
- 1937b. New or Little-known Tipulidae (Diptera). LIII. Neotropical Species. *The Annals and Magazine of Natural History*, series 10, 20: 481-504.
1938. New or Little-known Tipulidae (Diptera). LIV. Neotropical Species. *The Annals and Magazine of Natural History*, series 11, 1: 336-362, 8 figures.
- 1939a. Studies on the Crane-flies of Mexico. Part VI. (Order Diptera, Superfamily Tipuloidea). *Annals of the Entomological Society of America*, 32: 70-90.
- 1939b. New or Little-known Species of West Indian Tipulidae. IV. *The Journal of Agriculture of the University of Puerto Rico*, 23(2): 91-130, 18 figures.
1940. New or Little-known Tipulidae (Diptera). LVII. Neotropical Species. *The Annals and Magazine of Natural History*, series 11, 5: 275-297.
1942. Guide to the Insects of Connecticut. Part VI. The Diptera or True Flies of Connecticut. First Fas-

- cicle. External Morphology; Key to Families; Tanyderidae, Ptychopteridae, Trichoceridae, Anisopodidae, Tipulidae. *State Geological and Natural History Survey of Connecticut, Bulletin*, 64:vi, 1-517, 55 figures (with subfigures), 4 plates. Reprinted with two additional pages in 1966.
1946. Notes on the Tropical American Species of Tipulidae (Diptera). I. The Genus *Teucholabis* Osten Sacken. *Revista de Entomologia*, 17(3):375-400, 14 figures.
- 1947a. Notes on the Tropical American Species of Tipulidae (Diptera). II. The Primitive Eriopterini: *Sigmatomera*, *Trentepohlia*, *Gnophomyia*, *Neognophomyia*, *Gonomyia*, and Allies. *Revista de Entomologia*, 18(1/2):65-100, 31 figures.
- 1947b. Notes on the Tropical American Species of Tipulidae (Diptera). III. The Specialized Eriopterini: *Rhabdomastix*, *Cryptolabis*, *Erioptera*, *Molophilus*, *Styringomyia*, *Toxorhina*, and Allies. *Revista de Entomologia*, 18(3):317-360, 32 figures.
- 1948a. Notes on the Tropical American Species of Tipulidae (Diptera). IV. The Primitive Hexatomini: *Paradelphomyia*, *Austrolimnophila*, *Epiphragma*, *Lecteria*, *Polymera*, and Allies. *Revista de Entomologia*, 19(1/2):149-190, 33 figures.
- 1948b. Notes on the Tropical American Species of Tipulidae (Diptera). V. The Specialized Hexatomini: *Limnophila*, *Shannonomyia*, *Gynoplusia*, *Hexatoma*, *Atarba*, *Elephantomyia*, and Allies. *Revista de Entomologia*, 19(3):509-556, 36 figures.
1950. Notes on the Tropical American Species of Tipulidae (Diptera). VI. The Tribe Limoniini: Genus *Limonia*; Subgenera *Limonia*, *Neolimnobia*, *Discobola* and *Rhipidia*. *Revista de Entomologia*, 21(1/2):161-221, 42 figures.
1953. Notes on the Tipulidae of Ecuador (Order Diptera). Part IV. *Revista Ecuatoriana de Entomologia y Parasitologia*, 1(4):77-95, 9 figures.
1954. Notes on the Tipulidae of Ecuador (Order Diptera). Part V. *Revista Ecuatoriana de Entomologia y Parasitologia*, 2(1-2):51-68: 32 figures.
1962. The Crane Flies of the Galapagos Islands (Tipulidae, Diptera). *Opuscula Zoologica*. Herausgegeben von der Zoologischen Staatssammlung in München. 61:1-5, 6 figures.
- 1964a. The Crane-flies of Jamaica (Diptera, Tipulidae). *Bulletin of the Institute of Jamaica, Science Series*, 14:1-86, 97 figures.
- 1964b. Diptera (Nematocera: Tanyderidae, Ptychopteridae, Tipulidae). In *South African Animal Life*. Results of the Lund University Expedition in 1950-1951, 10:229-441, 124 figures.
1967. Notes on the Tropical American Species of Tipulidae (Diptera). VII. The Tribe Limoniini: Genus *Limonia*, Concluded; *Helius*, *Orimarga*, and Others; Tribe Pediciini: Subfamily Cyllindrotominae. *Studia Entomologica*, 10(1/4):277-352, 78 figures.
- Bergroth, Ernst E.  
1915. Some Tipulid Synonymy. *Psyche*, 22:54-59.
- Bigot, Jacques M. F.  
1854. Essai d'une Classification Generale et Synoptique de l'ordre des Insectes Dipteres. IIIe. *Annales de la Societe Entomologique de France*, (3)2:447-482.
- Brunetti, Enrico  
1911. Revision of the Oriental Tipulidae with Descriptions of New Species. *Records of the Indian Museum*, 6(5):231-314.
- Enderlein, Gunther  
1912. Studien uber die Tipuliden, Limoniiden, Cyllindrotomiden und Ptychopteriden. *Zoologische Jahrbuch*, 32, Abteilung für Systematics, 1-88, 51 figures.
- Guérin-Méneville, Felix E.  
1838. In Duperrey, L. I., editor, Voyage autour du monde sur la corvette de sa majeste La Coquille, *Zoologie*, 2(2):1-319.
- Haliday, Alexander H.  
1833. Catalogue of Diptera Occurring about Holywood in Downshire. *The Entomological Magazine* (London), 1:147-180.
- Hodge, Walter H.  
1941. The Vegetation of the Lesser Antilles, a Brief Review. *Chronica Botanica*, 6(17/18):402-404, 2 maps.  
1942. Plants Used by the Dominica Caribs. *Journal of the New York Botanical Garden*, 43(512):189-201. 26 Photographs, 1 map.
- LeConte, John L.  
1859. *The Complete Writings of Thomas Say on the Entomology of North America*, 2:1-814. (Reference pp. 38-66, 67-89).
- Linné, Carl von (Linnaeus)  
1758. *Systema Naturae per Regna Tria Naturae*, edition 10, volume 1, 824 pages.
- Loew, Hermann  
1851. Beschreibung einiger neuen Tipularia Terricola. *Linnaea Entomologica*, 5:385-406, 2 plates.  
1869. Diptera Americae Septentrionalis Indigena, Centuria Octava. *Berliner Entomologische Zeitschrift*, 13:1-52.
- Meigen, Johann W.  
1803. In Illiger's *Magazin für Insektenkunde*, 2:259-281.  
1818. *Systematische Beschreibung der Bekannten Europäischen Zweiflügeligen Insekten*, 1:xxxvi, 1-333, plates 1-11.  
1830. *Systematische Beschreibung der Bekannten Europäischen Zweiflügeligen Insekten*, 6:iv, 1-401, plates 55-66.
- Ober, Frederick A.  
1880. *Camps in the Caribbees, the Adventures of a Naturalist in the Lesser Antilles*, pages xvi-366, 34 figures (Dominica, Chapters 1-11).

- Osten Sacken, Carl R.
1859. New Genera and Species of North American Tipulidae with Short Palpi, with an Attempt at a New Classification of the Tribe. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 1859:197-256, 1 figure, 2 plates.
1869. Monographs of the Diptera of North America. Part IV. *Smithsonian Miscellaneous Collections*, 8(1, publication 219):1-345, 7 figures, 4 plates.
1878. Catalogue of the Described Diptera of North America (edition 2). *Smithsonian Miscellaneous Collections*, 16(2, Publication 270):1-276.
1887. Studies on Tipulidae. Part II. Review of the Published Genera of the Tipulidae Brevipalpi. *Berliner Entomologisches Zeitschrift*, 31:163-242.
- Saint-Fargeau, Count de (Lepelletier, Amedee L. M.), with Latreille, P. A., et al.)
1825. *Entomologie, ou Histoire Naturelle des Crustaces, des Arachnides et des Insectes*, 10:1-344.
- Say, Thomas
1823. Descriptions of Dipterous Insects of the United States. *Journal of the Academy of Natural Sciences of Philadelphia*, 3:9-54, 73-104. (See LeConte 1859.)
- Skuse, Frederick A. A.
1890. Diptera of Australia. Part VII. The Tipulidae Brevipalpi. *Proceedings of the Linnaean Society of New South Wales*, (2)4:757-892, 4 plates with 70 figures. (Preprint 1889.)
- Stephens, James F.
1829. *A Systematic Catalogue of British Insects*, 2:388.
- Stone, Alan, Curtis W. Sabrosky, Willis W. Wirth, Richard H. Foote, and Jack R. Coulson
1965. *A Catalogue of the Diptera of America North of Mexico*. United States Department of Agriculture, Agricultural Research Service, pages 1-1696.
- Walker, Francis F.
1848. *List of the Specimens of Dipterous Insects in the Collection of the British Museum*. Volume 1:1-229.
- Wiedemann, Christian R. W.
1820. Diptera exotica (edition 1). Part I:i-xix, 1-42, 1 figure.
1824. *Analecta Entomologica*, 60 pages, 1 plate.
- Williston, Samuel W.
1896. On the Diptera of St. Vincent (West Indies). *Transactions of the Entomological Society of London*, 1896:253-446, plates 8-14.



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