

NEW OR LITTLE-KNOWN NEOTROPICAL TIPULIDAE
(DIPTERA). I

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In the present paper I am describing several new species of crane flies from various countries of Central and western South America, especially from Ecuador, Bolivia and Chile, taken by Luis E. Peña Guzman, and from Panama where they were collected by Thomas H. G. Aitken at the Fortuna Dam site on the Chiriqui River. A few further species were taken in Guatemala by Thomas H. Farr and in Costa Rica by Ira Loren Wiggins. I am greatly indebted to the above friends and co-workers for the present materials and others that have been considered in earlier papers. The types of the novelties will be placed in the United States National Museum where the Alexander Collection will be preserved. A recent brochure entitled "The United States National Entomological Collections—Smithsonian Institution Press," prepared by staff members of the National Museum of Natural History, August 1976, page 25, may be consulted. This important paper was prepared for distribution to interested parties during the XVth International Congress of Entomology held in Washington at that time.

TIPULINAE

***Leptotarsus subapterus* sp.n.**

Nearly apterous; wings (male) very reduced in size and without venation; general coloration of thorax chiefly brown, patterned with black and silvery gray; abdomen light brown, patterned with darker brown and brownish yellow; antennae of male 8-segmented, short, stout; legs long, brownish black to black; male hypopygium with outer dististyle oval, flattened; inner style bearing about 17 small spinoid setae.

Male. — Length about 10 mm.; wings vestigial; antenna about 1.2 mm.; fore leg, femora 5.5 mm., tibia 5.9 mm., tarsus about 7 mm. Middle leg, femora 7 mm.;

¹ Contribution from the Entomological Laboratory, University of Massachusetts.

tibia 6.8 mm.; tarsus about 8.3 mm. Hind leg, femora 7.5 mm.; tibia 8.5 mm., tarsus about 10 mm.

Head with mouthparts reduced; maxillary palpi very short, segments one and two subequal, nearly globular, segment three longer and stouter; terminal segment short-oval, about one-half longer than the third. Frontal prolongation of head short, without nasus. Antennae (Fig. 3) short, 8-segmented, the flagellar segments progressively enlarged outwardly to form a slender club; first flagellar segment broadened outwardly, segments two to five short, two and five and three and four subequal in length, terminal segment small, caplike, more or less fused with the penultimate; vestiture of segments short and sparse, without strong verticils. Head dorsally dark brown, vaguely pruinose, along margins of eyes very narrowly more yellowed; vertical tubercle low, apex obtuse.

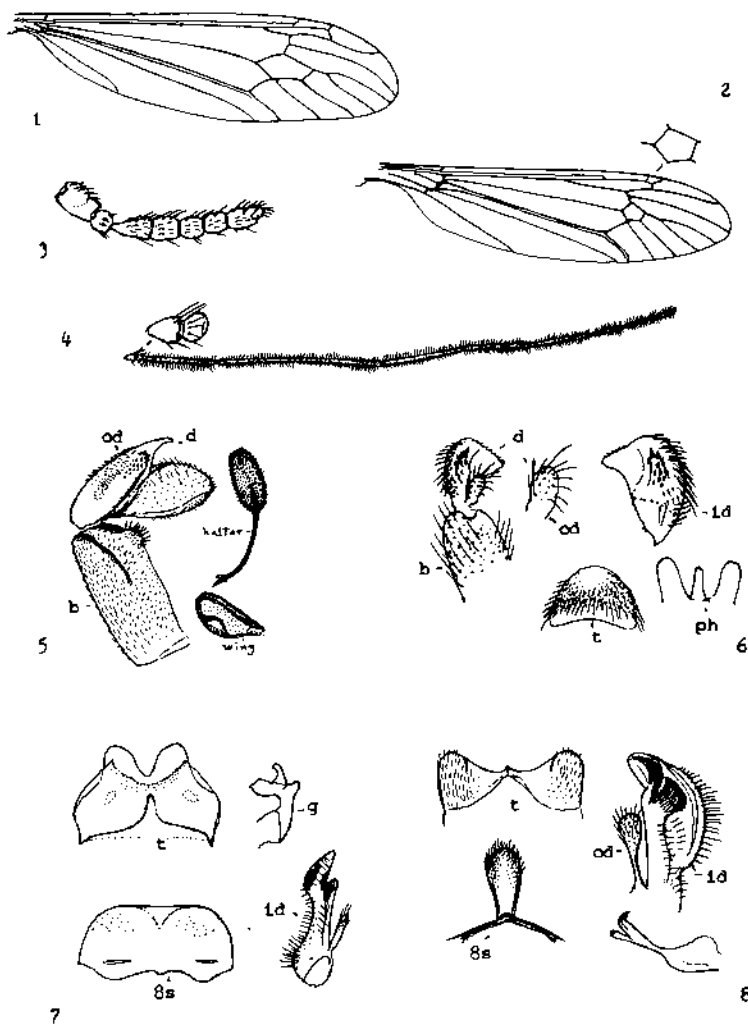
Pronotum elevated, brown, gray pruinose. Mesonotum depressed-flattened, scutellum not elevated, chiefly dark brown, on anterior half vaguely lined with black, median region posterior to the wing level broadly silvery gray; sides of scutellum and mediotergite broadly blackened. Halteres (Fig. 5) black, stem long and very slender, knob flattened, large, about three times the area of the wing. Legs long and stout; coxae light gray, trochanters more yellowish gray; remainder of legs brownish black to black; relative proportions of the individual segments shown above; tibial spur formula 1-2-1; claws smooth. Wing (Fig. 5) very reduced and deformed, dorsal in position, placed unusually forward near posterior end of praescutum, appearing as darkened ear-shaped structures lying in a shallow furrow, with no apparent venation.

Abdominal tergites light brown, lateral borders brownish yellow, with continuous sublateral darker brown lines; sternites almost uniformly brownish yellow. Male hypopygium (Fig. 5) brown; dististyles, *d*, long and conspicuous, outer style, *od*, flattened, oval, the margins more darkened; inner style extended into a flattened glabrous lobe, the apex rounded; modified spinoid setae about 17 in number, small, short-pointed; bases yellowed. Basistyle, *b*, long, outer end of mesal face with a small low tubercle that bears delicate setae.

Holotype. — ♂, North East Cocaba, Cochabamba, Bolivia, 3550 feet, January 28, 1976 (Peña).

This distinct fly is readily told from other regional species of the genus by the very reduced wings, structure of the antennae and the male hypopygium. It probably will best be assigned to the typical subgenus, based on the number of antennal segments. A comprehensive analysis of the subgenera of *Leptotarsus* Guérin has been provided by Dobrotworsky, based on the Australian species (Australian Journ. Zoology, Supplementary Series, No. 16: 11-43, figs. 1-73; 1972).

TEXT-FIGS. 1-8. — Fig. 1, *Leptotarsus (Tanypremnella) elongatus* n.sp., venation; Fig. 2, *Tipula (Eumicrotipula) acroleuca* n.sp., venation; Fig. 3, *Leptotarsus*



subapterus n.sp., antenna; Fig. 4, *Leptotarsus (Tanypremnella) elongatus* n.sp., antenna; Fig. 5, *Leptotarsus subapterus* n.sp., male hypopygium; Fig. 6, *Leptotarsus (Tanypremnella) elongatus* n.sp., male hypopygium; Fig. 7, *Tipula (Eumicrotipula) acroleuca* n.sp., male hypopygium; Fig. 8, *Tipula (Eumicrotipula) latifolia* Alex., male hypopygium. Male hypopygium: *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *id*, inner dististyle; *od*, outer dististyle; *ph*, phallosome; *s*, 8th sternite; *t*, 9th tergite.

Leptotarsus (Tanypremnella) elongatus sp.n.

General coloration of body orange or yellow; antennae of male elongate, nearly as long as the wing; legs obscure brownish yellow; wings nearly hyaline, stigma very slightly darker; outer third of vein R_{4+5} deflected caudad, ending shortly beyond the wing apex, cell R_3 narrowed at margin; male hypopygium with tergite small, narrowed at base, widened gradually outwardly, posterior border gently emarginate.

Male. — Length about 11 mm.; wing 11 mm.; antenna about 10 mm.

Frontal prolongation of head short, light orange; palpi elongate, brown. Antenna (Fig. 4) 10-segmented, very long, as shown by the measurements, nearly equal to the wing; brownish yellow; scape and pedicel very small, flagellar segments long, without basal enlargements, the relative proportions about as shown; all segments with abundant erect setae over the entire length, the setae about twice as long as the diameter of the segment. Head orange; vertex with sparse long erect setae.

Pronotum and praescutum uniformly orange, posterior sclerites of notum and the pleura paler orange yellow, without setae. Entire thorax glabrous or virtually so, each scutal lobe with four or five microscopic erect setules. Pleura yellow. Halteres elongate, stem light yellow, knob weakly infuscated. Legs with coxae and trochanters pale yellow; remainder of legs uniformly obscure brownish yellow, the outermost tarsal segments very slightly darker; claws small, strongly curved, near base with a small erect point. Wing (Fig. 1) nearly hyaline, unpatterned except for the scarcely indicated stigma; veins delicate. Veins beyond general level of cord with numerous dark trichia, lacking on all veins comprising cell $1st M_2$ and petiole of cell M_1 ; very sparse trichia on outer ends of Cu and $1st A$. Venation as shown; outer third of R_{4+5} deflected strongly caudad, ending beyond the wing apex and slightly narrowing cell R_3 at outer end.

Abdomen pale brown, variegated by yellow. Male hypopygium (Fig. 6) with the tergite, t , small, in comparison with *megacera* and others, narrowed at base, gradually widened outwardly, posterior border gently emarginate, lateral lobes obtuse; setae of outer half abundant, the outer ones longer, directed caudad or laterad on margins. Dististyles, d , and phallosome, ph , as shown.

Holotype. — ♂, chiefly mounted on two slides, Abitagua, Oriente, Ecuador, 1800 meters, April 15, 1940 (Clarke Macintyre).

The species is most similar to *Leptotarsus (Tanypremnella) megacera* (Alexander), likewise from Abitagua, Ecuador (Ann. Ent. Soc. America, 36: 105-106; 1943), agreeing in the very long male antennae, differing in the coloration of the body, wings and legs, in the venation of the outer radial field, and in hypopygial structure, especially the unusually small tergite. Other allied species have the male antennae much shorter and differing in details of coloration, venation and in hypopygial structure.

The type station, Abitagua, was one of the favored areas where William Clarke Macintyre collected very many insect specimens

from the 1920s until his death in 1952. A paper by the writer concerning this locality and work by Macintyre may be consulted (Rev. Ecuat. Ent. Par., 1: 1-9; 1953).

Tipula (Eumicrotipula) acroleuca sp.n.

General coloration of head and thorax gray, praescutum with a broad blackened central stripe, lateral markings narrow, pleura light gray; wings with cells before the cord obscurely whitened, cell *C* pale brown, *Sc* uniformly dark brown; cell *M* adjoining vein *Cu* with a broad pale brown stripe; wings with cell *1st M*₂ short-pentagonal; abdomen brownish black, lateral borders of tergites broadly yellow; male hypopygium darkened, tergite with posterior third whitened, deeply emarginate; outer dististyle small, slender; phallosome with gonapophyses distinctive, strongly arcuated, outer end with a strong erect lobe.

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

Frontal prolongation of head blackened, gray pruinose, relatively short and stout, slightly less than the remainder of head, nasus small, with long yellow setae; palpi black. Antennae with scape and flagellum black, pedicel abruptly light yellow; flagellar segments moderately incised, verticils shorter than the segments, each of the proximal three or four segments with longer setae beyond the enlarged bases. Head gray, vertex with a vague narrow more darkened line that becomes obsolete on the very low inconspicuous vertical tubercle.

Pronotum gray. Mesonotal praescutum clear light gray, with a broad blackened central stripe, narrowed at posterior end, lateral stripes narrow; posterior sclerites of notum light gray, each scutal lobe with a single elongate blackened area; scutellum and mediotergite gray, vaguely blackened medially. Pleura clear light gray, ventral sternopleurite and meron slightly darker gray; dorsopleural membrane yellowed. Halteres with stem brownish yellow, knob dark brown. Legs with coxae light gray, trochanters yellow; remainder of all legs broken. Wings (Fig. 2) with cells before cord obscurely whitened, cell *C* pale brown, *Sc* darker brown throughout; cell *M* with a broad pale brown stripe adjoining vein *Cu*; stigma uniformly pale brown; cells beyond cord pale brown, center of *1st M*₂ and adjoining parts of cells *R* and *M*₃ whitened, including the veins, remaining veins dark brown to brownish black. Free tip of *Sc*₂, *R*₁₊₂ and the veins comprising the cord and apex of *Rs* whitened. Longitudinal veins beyond general level of origin of *Rs* with trichia, including also vein *2nd A*, lacking on *1st A*. Venation: Cell *1st M*₂ short-pentagonal; second section of *M*₁₊₂ short, from one-fourth to one-fifth longer than the basal section; petiole of cell *M*₁ nearly twice *m*.

Abdomen brownish black, lateral borders of tergites broadly yellow, basal segments gray pruinose. Male hypopygium (Fig. 7) with ninth tergite, *t*, whitened, transverse, posterior third thin, deeply emarginate, anterior portion brownish black, each half with a paler area enclosing an oval pale brown area as shown; anterior margin of tergite whitened, membranous, at midline extended caudad. Dististyles, *id*, as shown; outer style small, slender. Phallosome with gonapophyses, *g*, distinc-

tive in conformation. Eighth sternite, *8s*, apparently without a modified posterior lobe as is found in most other species of the subgenus.

Holotype. — ♂ Western Cordillera, Las Raices, Malleco, Chile, 1100 meters, December 18-21, 1976 (Peña).

Tipula (Eumicrotipula) acroleuca is readily told from other generally similar regional species by the wing pattern and hypopygial structure. The distinctive color pattern of the ninth tergite has suggested the specific name. The most similar species is *T. (E.) nothofagetorum* Alexander (Chile, Argentina) which has the body and wing coloration much the same but with the hypopygium entirely different.

***Tipula (Eumicrotipula) latifolia* Alexander**

Boletín Dept. Sanidad Vegetal, Chile, 3, no. 2: 124-126, fig. 2 (hypopygium), 1943 (1944 in Catalogue).

Chile (Llanquihue, Rio Blanco), numerous records. Later taken in Argentina (Bariloche, March 1966, Axel Hemmingsen). The publication in which the species was described and figured is not readily accessible and further illustrations of the male hypopygium are provided (Fig. 8).

LIMONIINAE

***Limonia (Rhipidia) diacaena* sp.n.**

Antennae of male long-unipectinate (*Monorhipida*), flagellar segments 1 to 11 branched; general coloration brown, mesonotum and pleura patterned, especially the latter; halteres brownish black; legs with femora brownish yellow, darker brown subapically, tibiae and tarsi light brown; wings with ground color of anterior third pale yellow, remainder of ground pale brown; a series of five darker brown costal areas, including the stigma; cells beyond cord, including the wing tip, yellowed, with pale brown centers; male hypopygium with rostral prolongation of ventral dististyle long and slender, rostral spines long, gently curved; gonapophyses blackened, apices bifid.

Male. — Length about 7-7.5 mm.; wing 7.5-8.5 mm.; antenna about 2.3-2.5 mm.

Head dark brown; anterior vertex narrowed. Antennae (Fig. 10) long-unipectinate; dark brown, apical pedicels of flagellar segments pale; flagellar segments 1-11 branched, on first segment stout, longer and more slender on succeeding segments, longest on intermediates where the branch is about 2 to 2.5 times the segment, somewhat shorter on the paratype, branch of penultimate segment only slightly longer than the segment, as shown; terminal segment elongate, narrowed on outer fourth.

Pronotum small, brown, sparsely pruinose. Mesonotal praescutum and scutal lobes medium yellowish brown, anterior and lateral parts of praescutum more obscure yellow, median region of scutum and the scutellum testaceous yellow; mediotergite slightly darker yellowish brown. Pleura obscure yellowish brown, dorsally with a narrow more blackened longitudinal stripe, more expanded behind, ventrally with a narrower dark stripe. Halteres brownish black, base of stem narrowly paler. Legs with coxae brownish yellow, trochanters slightly paler; femora brownish yellow, bases clearer yellow, darker brown subapically, extreme tips yellowed; tibiae and tarsi light brown, outer tarsal segments blackened; claws slender, at near one-third the length with a single major spine, with more basal microscopic spinules. Wings with the restricted ground of anterior third pale yellow, remainder of ground pale brown; a series of five darker brown costal areas, the stigma being the outermost, smaller in the holotype, in the paratype larger, restricting the ground color; cord narrowly bordered by darker brown; cells beyond cord, including the wing tip, yellowed, with pale brown centers; *M*, *Cu* and the *Anals* almost uniformly light brown, paler in outer end of cell *1st A* adjoining vein *2nd A*; cord and outer end of cell *1st M*₁, with the extreme tips of the longitudinal veins darker brown. Venation: *m-cu* shortly before the fork of *M*.

Abdomen brown, hypopygial appendages more yellowed. Male hypopygium (Fig. 9) with tergite, *r*, transverse, slightly narrowed posteriorly, the border very gently concave. Basistyle, *b*, slightly smaller than the ventral dististyle, apex of ventromesal lobe broadly rounded. Dististyles, *d*, with dorsal style a blackened rod, outer half decurved, narrowed into an acute spine; ventral style with rostral prolongation relatively long and slender, the two spines at near two-thirds the length of prolongation, long and gently curved. Gonapophyses, *g*, blackened, apex conspicuously bifid.

Holotype. — ♂, Paracti, Chapare, Cochabamba, Bolivia, 2200-2900 meters, February 2-4, 1976 (Peña). Paratopotype, ♂, 2300 meters, February 1-5, 1976 (Peña).

Limonia (Rhipidia) diacaena is allied to *L. (R.) subcostalis* Alexander and other generally similar regional species, including *L. (R.) leda* Alexander, Peru, *L. (R.) megalopyga* Alexander, Peru, *L. (R.) mystica* Alexander, Colombia, and some others. It differs especially in hypopygial characters, including the rostral prolongation of the ventral dististyle and the gonapophyses.

***Limonia (Rhipidia) flavopostica* sp.n.**

Antennae entirely black, flagellar segments two to eleven each with a single long branch; head of male holoptic; thorax medium brown dorsally, darker behind, variegated with yellow, pleura obscure yellow, with two narrow black longitudinal stripes; halteres black; legs dark brown, posterior tarsi with segments two to four clear light yellow; wings chiefly uniform brown, costal border variegated with five

darker brown costal areas, the five yellow interspaces very reduced in size; *Sc*₁ ending about opposite two-thirds *Rs*; abdominal tergites black, sternites obscure yellow, hypopygium brownish yellow; male hypopygium with basistyle about two-thirds the ventral dististyle; rostral prolongation short, pale yellow, the two spines very small; gonapophyses blackened, apical point erect.

Male. — Length about 7 mm.; wing 8 mm.; antenna about 2.8 mm.

Rostrum and palpi black. Antennae with scape and pedicel brownish black, flagellum entirely black, including pedicels of all segments; first flagellar segment with branch shorter than the segment; segments two to eleven each with a single long branch, on middle segments the longest slightly less than twice the segment, eleventh segment equal to its branch, terminal segment longer than the penultimate, its outer half strongly narrowed. Eyes large, holoptic, obliterating the anterior vertex; posterior vertex gray.

Pronotum dark brown, pretergites and adjoining part of postnotum whitened. Mesonotal praescutum medium brown, posterior half of central stripe darker and more polished, laterally narrowly bordered with black, lateral stripes light brown; scutal lobes dark brown, paler laterally, median region pale; scutellum brown, posterior border and parascutella paler; mediotergite brown, lateral border narrowly obscure yellow. Pleura obscure yellow with two narrow black longitudinal stripes, the long dorsal stripe extending from the cervical region to base of halteres; ventral stripe short, including the ventral sternopleurite and bases of middle and hind coxae. Halteres black, base of stem narrowly yellow. Legs with fore coxae brownish black, remaining coxae obscure yellow, the bases more darkened, as described; trochanters yellow; femora and tibiae dark brown, fore and middle tarsi brown, posterior tarsi with basal segment brownish yellow, segments two to four clear light yellow, terminal segment and claw black. Wings chiefly uniform brown, darker anteriorly, variegated by five darker brown costal areas, the third at origin of *Rs*, the last being the stigma, the five yellow interspaces very reduced in size, extending slightly into the radial field; bases of anal cells narrowly pale; veins brown, slightly paler in the yellowed areas. Venation: *Sc*₁ ending about opposite two-thirds *Rs*, *Sc*₂ near its tip; *m-cu* at or shortly before the fork of *M*.

Abdominal tergites black, sternites obscure yellow, hypopygium brownish yellow. Male hypopygium (Fig. 11) with posterior border of tergite, *t*, very gently concave. Basistyle, *b*, about two-thirds the ventral dististyle, ventromesal lobe relatively small. Dorsal dististyle, *d*, slightly enlarged before the acute terminal point; ventral style with rostral prolongation short pale yellow, the two spines very small, only about one-half the diameter of the prolongation. Gonapophyses, *g*, blackened, the apical point erect.

Holotype. — ♂, Paracti, Chapare, Cochabamba, Bolivia, 2300 meters, February 1-5, 1976 (Peña).

The present fly is generally similar to *Limonia* (*Rhipidia*) *variicosta* Alexander, of Panama, differing in the uniformly blackened antennae, clear yellow posterior tarsi and especially in hypopygial details, including the very small rostral spines of the

ventral dististyle. Other somewhat similar species include *L. (R.) cermatoleuca* Alexander, Peru, *L. (R.) megalopyga* Alexander, Peru, and *L. (R.) mystica* Alexander, Colombia.

***Limonia (Rhipidia) gracililoba* sp.n.**

Antennae with flagellar segments two to eleven each with two branches, terminal segment narrowed apically; thoracic dorsum and pleura obscure yellow, conspicuously patterned with brownish black; knobs of halteres infuscated; legs light brown; wings light brown, anterior half darker, costal area with six small whitened areas, posterior cells with similar scattered pale markings; *Sc* long, *Sc*₁ ending opposite two-thirds *Rs*; male hypopygium with ventromesal lobe of basistyle very long and slender, narrowed to the subacute tip.

Male. — Length about 6.5 mm.; wing 7.5 mm.; antenna about 2.6 mm.

Head dark brown, eyes large, anterior vertex correspondingly narrow; mouthparts and maxillary palpi dark brown, terminal segment of latter slender. Antennae dark brown, apical pedicels of branched flagellar segments whitened; first flagellar segment slightly produced beneath; flagellar segments two to eleven each with two branches, longest on the middle segments, at midlength the branches about two and one-half times the segments; last branched segment with the branches slightly unequal, the longer branch slightly exceeding the segment; terminal segment narrowed apically.

Pronotum small, light brown, with conspicuous erect setae. Mesonotal praescutum with ground obscure yellow, including the broad lateral and humeral regions, disk with three broad stripes, the median one narrowed and indistinctly trifid at anterior end, posterior half entire, lateral stripes narrower, crossing the suture to include the scutal lobes. Median region and scutellum light gray pruinose; parascutella obscure yellow; mediotergite medium brown, pleurotergite obscure yellow. Pleura yellow, with two conspicuous brownish black stripes, dorsal line extending from the propleura across the anepisternum and pteropleurite, narrowly reaching the base of halter, ventral stripe including the subventral sternopleurite and meron. Halteres with stem light yellow, knob infuscated. Legs with coxae light yellow, fore and middle pairs weakly darkened basally, posterior coxae less darkened; trochanters yellow; femora brown, restrictedly paler basally; tibiae and tarsi light brown, outer segments darkened. Wings chiefly light brown, anterior half darker, the costal fourth with six small whitened areas from the arculus to outer end of stigma, all areas smaller than the darkened interspaces; posterior cells with similar small pale areas on outer third of wing, at outer end of cell *R*, two in cell *R*₃, with others in center of cell *1st M*₂ and at outer end of cell *1st M*₂ adjoining vein *2nd A*; smaller vague pale areas in cells of outer part of wing; veins brown, darker on costal border, yellowed in the pale areas. Venation: *Sc* long, *Sc*₁ ending opposite two-thirds *Rs*, *Sc*₂ near tip; free tip of *Sc*₂ some distance basad of *R*₂; cell *1st M*₁ rectangular, subequal in length to vein *M*₁; *m-cu* close to fork of *M*.

Abdomen chiefly dark brown, with indistinct longitudinal more whitened lines on segments two to seven, outer segments uniformly darkened. Male hypopygium

(Fig. 14) with tergite, *t*, very narrow, the breadth slightly more than four times the length; posterior border nearly straight; setae of moderate length, smaller toward the midline. Basistyle, *b*, with ventromesal lobe very long and slender, narrowed to the subacute tip, vestiture very reduced, including microscopic setulae at apex. Dorsal dististyle unusually long, very slender, gently curved, very slightly more expanded before the decurved acute terminal spine. Ventral dististyle, *vd*, with the prolongation long and slender, pale yellow, including the two short nearly basal spines. Gonapophysis, *g*, with mesal apical lobe darkened, apex subobtuse. Aedeagus, *a*, pale, apex twisted in the unique type, the details uncertain as to position. No blackened proctiger as in various related species.

Holotype. — Yungas, South Corani, Chapare, Cochabamba, Bolivia, 2900 meters, January 31, 1976 (Peña).

The most evident specific characters of the present fly are hypopygial, including the long slender ventromesal lobe of the basistyle and the rostral prolongation of the ventral dististyle. Related species include *Limonia (Rhipidia) complexa* Alexander, Peru, *L. (R.) perarmata* Alexander, Peru, and *L. (R.) superarmata* Alexander, all most readily separated by hypopygial characters.

***Limonia (Rhipidia) martinezi* sp.n.**

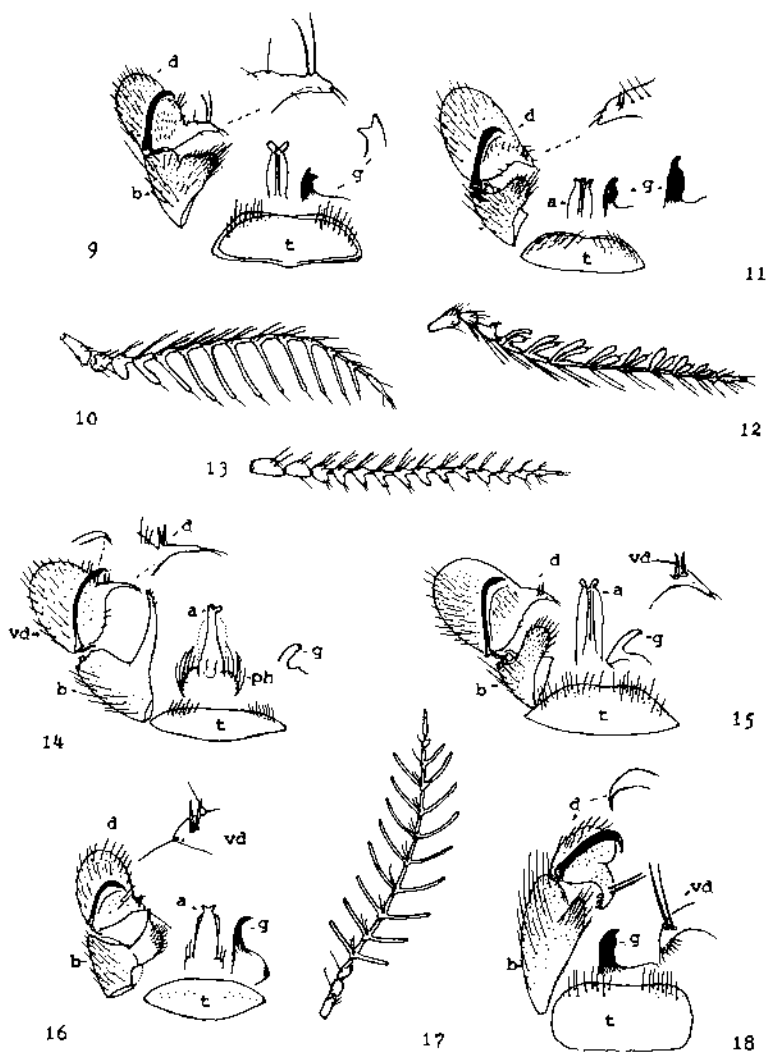
General coloration of mesonotum light brown, more yellowish brown behind; antennae with proximal 11 flagellar segments unipectinate, short; praescutum broadly darker medially, pleura yellowed, with two darkened longitudinal stripes, the more dorsal darker and broader; legs brownish yellow, clearer yellow outwardly, outer three tarsal segments blackened; wings brownish yellow, costal region more yellowed, a very restricted darkened pattern; abdomen light brown; male hypopygium with rostral prolongation of ventral dististyle slender, with two subequal short spines at and beyond midlength.

Male. — Length about 5.5 mm.; wing 7 mm.; antenna about 1.8 mm.

Head and hypopygium mounted on slide. Head brownish yellow, rostrum, mouthparts and antennae darker brown; anterior vertex narrower than the diameter of the antennal scape. Antennae (Fig. 13) brown, flagellar segments short-unipectinate, the pedicels slightly paler; all flagellar segments excepting the last with conspicuous apical pedicels; segments 1 to 11 unipectinate, the first broadly so, the pedicel abrupt, succeeding segments with more slender branches, the longest at near midlength, slightly shorter than the segment.

Pronotum reduced, light brown. Mesonotal praescutum light brown, central area slightly darker to form a broad pale brown stripe, humeral region restrictedly

TEXT-FIGS. 9-18. — Fig. 9, *Limonia (Rhipidia) diacaena* n.sp., male hypopygium; Fig. 10, *Limonia (Rhipidia) diacaena* n.sp., male antenna; Fig. 11, *Limonia (Rhipidia) flavopostica* n.sp., male hypopygium; Fig. 12, *Limonia (Rhipidia) polythrix* n.sp., male antenna; Fig. 13, *Limonia (Rhipidia) martinezi* n.sp., male



antenna; Fig. 14, *Limonia (Rhipidia) gracililoba* n.sp., male hypopygium; Fig. 15, *Limonia (Rhipidia) martinezi* n.sp., male hypopygium; Fig. 16, *Limonia (Rhipidia) neorhasma* n.sp., male hypopygium; Fig. 17, *Limonia (Rhipidia) subproctigerica* n.sp., male antenna; Fig. 18, *Limonia (Rhipidia) polythrix* n.sp., male hypopygium. Male hypopygium: *a*, aedeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *ph*, phallosome; *t*, 9th tergite; *vd*, ventral dististyle.

pale yellow; posterior sclerites of notum pale yellowish brown, clearer yellow laterally. Pleura yellowed with two long darkened stripes, the dorsal one broader and darker, extending from the fore coxae to base of abdomen, the very narrow ventral line best indicated on the sternopleurite. Halteres pale brown, base of stem yellowed. Legs with coxae and trochanters yellow; femora brownish yellow, tibiae and tarsi slightly clearer yellow, outer three tarsal segments blackened; claws long and slender; ventral surface near base with a powerful straight spine and a more basal group of three or more spinules. Wings brownish yellow, prearcular and costal fields clearer yellow; darkened pattern very restricted and inconspicuous; very small slightly darker brown seams at *h*, origin of *Rs* and tip of *Sc*; narrowly interrupted markings at origin of *Rs*, cord, outer end of cell *1st M*₂ and outer end of stigma in free tip of *Sc*₁ and *R*₁; wing apex pale; veins light brown, slightly darker in the patterned areas. Venation: *Sc*₁ ending about opposite two-fifths *Rs*, *Sc*₂ near tip; free tip of *Sc*₂ and *R*₁ in transverse alignment; *m-cu* shortly before fork of *M*; veins *M*₃₊₄ and *M*₄ subequal.

Abdomen light brown, hypopygium slightly paler. Male hypopygium (Fig. 15) with tergite, *t*, transverse, posterior border very slightly emarginate. Basistyle, *b*, small, its area about one-third that of the ventral dististyle; ventromesal lobe obtuse. Dorsal dististyle, *d*, a gently curved slender rod, slightly enlarged before the acute apical spine; ventral dististyle large and fleshy, rostral prolongation slender, with two short spines at and beyond midlength. Gonapophysis, *g*, weakly darkened, apex slightly emarginate, outer point slightly longer. Aedeagus, *a*, long and relatively narrow, sides parallel, apical lobes small.

Holotype. — El Limbo, Chapare, Cochabamba, Bolivia, 2000 meters, February 1959 (Antonio Martinez).

The species is named for the collector, the Coleopterist, Antonio Martinez. It is distinguished from other generally similar species with unipectinate antennae in the male sex in the coloration and structure of the antennal flagellar segments and in the details of the hypopygium, especially the ventral dististyle and gonapophyses.

***Limonia (Rhipidia) neorhasma* sp. n.**

Allied to *rhasma*; general coloration of mesonotum brownish orange, pleura with a broad blackened dorsal stripe; antennae black throughout, with eight long-biflabellate flagellar segments, the twelfth segment with a single branch; wings almost uniformly brown, with a sparse darker and whitened pattern; male hypopygium with the rostral spines of the ventral dististyle short, the prolongation very short, obtuse.

Male. — Length about 7 mm.; wing 7 mm.; antenna about 2.4 mm.

Head, including the mouthparts and antennae, black. Antennae elongate, including the flagellar branches, the formula 2 + 1 + 8 + 1 + 2; longest branches slightly less than three times the segment (on segments seven and eight), the single branch of

segment twelve slightly exceeding the segment itself; the strong flagellar setae less than half as long as the branches.

Mesonotum almost uniformly brownish orange, pleura more yellowed, with a broad blackened dorsal longitudinal stripe. Halteres black, base of stem yellowed. Legs with coxae and trochanters yellow, remainder of legs dark brown. Wings almost uniformly brown; stigma and four larger costal areas darker brown, separated by very small whitened areas, the largest of these before the stigma; veins darker brown. Veins beyond general level of cord with abundant long trichia. Venation: Sc long, Sc_1 ending about opposite three-fifth Rs , Sc_2 near its tip; cell $1st M_2$ slightly shorter than vein M_4 ; $m-cu$ at fork of M .

Abdomen dark brown, centers of segments slightly paler than the apices. Male hypopygium (Fig. 16) with the tergite, t , narrow, transverse, posterior border straight; setae small and weak. Basistyle, b , with ventromesal lobe produced caudad into a narrow point, outer margin with a concentration of long delicate setae. Dorsal dististyle a slender curved sickle, apex a curved acute spine. Ventral dististyle, vd , about twice the size of the body of the basistyle; rostral prolongation very short, obtuse, terminating in two long delicate setae; rostral spines short and pale, on face of prolongation. Gonapophysis, g , relatively small, mesal-apical lobe a slender black spine, curved and narrowed outwardly. Aedeagus, a , terminating in two small divergent lobules.

Holotype. — ♂, Paracti, Chapare, Cochabamba, Bolivia, 2200-2900 meters, February 2-4, 1976 (Peña).

Limonia (Rhipidia) neorhasma is most similar to *L. (R.) rhasma* Alexander, of Peru, differing especially in the larger size, long flagellar branches and in hypopygial structure, including especially the rostral prolongation of the ventral dististyle, ventromesal lobe of basistyle, gonapophyses, and aedeagus.

***Limonia (Rhipidia) polythrix* sp.n.**

General coloration of body dark brown, thorax patterned with yellow, extensively so on pleura with two broad brown stripes; antennae 13-segmented, dark brown, outer ends of flagellar segments pale, flagellar segments 2 to 9 each with two relatively short conspicuous flattened blades; knobs of halteres brown; legs dark brown; wings chiefly brown, costal fourth with five yellowed areas; cells of outer third of wing with abundant macrotrichia, lacking in cell C ; Sc long, Sc_1 ending about opposite midlength of Rs ; cell $1st M_2$ subequal in length to vein M_4 ; abdomen light brown, apices of intermediate tergites conspicuously darker brown; male hypopygium with posterior border of tergite nearly straight; ventral dististyle small, slightly smaller than the basistyle; rostral prolongation large, with two long spines.

Male. — Length about 5.5 mm.; wing 6 mm.; antenna about 1.9 mm.

Described from type mounted on slide. Rostrum and palpi dark brown. Antennae 13-segmented (Fig. 12), dark brown, the outer ends of flagellar segments whitened; first flagellar segment simple or slightly produced laterad at apex; flagellar

segments two to nine short-bipectinate, the branches subequal in length to the segments; outer two segments simple, the terminal one long, narrowed to apex. Head dark brown.

Pronotum brown. Mesonotal praescutum obscure yellow, with brown stripes, posterior sclerites of notum brown. Pleura obscure yellow, with two broad brown longitudinal stripes. Halteres with stem pale, knob brown. Legs with coxae brown, pale apically; trochanters yellow; remainder of legs dark brown. Wings chiefly brown, the costal fourth with five yellowed areas extending from the costa into the upper radial cells, the pale areas smaller than the darkened interspaces, the latter including four in the subcostal field and the larger stigma; a smaller yellowed area at outer end of vein *2nd A* in cell *1st A*; veins brown. Cells of about the outer two-thirds of wing with abundant macrotrichia, lacking in cell *C*, including other cells beyond origin of *Rs*, in cell *R* with sparse scattered trichia almost to base. Venation: *Sc* long, *Sc*₁ ending near midlength of *Rs*, *Sc*₂ near its tip; free tip of *Sc*₂ slightly proximad of *R*₁; cell *1st M*₂ subequal in length to vein *M*₂; *m-cu* shortly before the fork of *M*.

Abdominal segments light brown, apices of intermediate tergites conspicuously dark brown, narrower than the pale bases; hypopygium light brown. Male hypopygium (Fig. 18) with tergite, *t*, transverse, posterior margin nearly straight, without lobes. Basistyle, *b*, narrow, ventromesal lobe simple. Dorsal dististyle, *d*, with apex strongly decurved into a spine. Ventral dististyle, *vd*, small, its area slightly less than that of the basistyle; rostral prolongation large, the two spines subequal in length or exceeding the prolongation itself. Gonapophysis, *g*, blackened, erect, the apex a small point.

Holotype. — ♂, on slide. Fortuna Dam Site, Chiriqui River, Chiriqui Province, Panama, 920 meters, February 1976 (Thomas Aitken).

The present fly is readily told from all other regional species by the 13-segmented antennae, with the flagellar branches conspicuously flattened, and by the abundant macrotrichia in the outer wing cells. Of the more than one hundred Neotropical members of the subgenus presently known only two others have trichia in the wing cells, these being *Limonia (Rhipidia) aphrodite* Alexander and *L. (R.) mordax* Alexander, both from Peru. These latter species differ conspicuously in the wing pattern and the hypopygium. The latter fly named above has the flagellar branches modified somewhat as in the present fly but differs evidently in the unpatterned wings and in hypopygial structure, including the short rostral spines of the ventral dististyle.

***Limonia (Rhipidia) pumillistyla* sp.n.**

Allied to *flabelliformis*; general coloration of head and thorax brown, legs

medium brown; antennae of male with nine long-biflabellate segments, segments four to twelve each with two long branches; wings generally as in *flabelliformis*, pale brown, the costal border with five extensive darker brown areas; abdominal segments obscure yellow, posterior borders of segments two to seven dark brown; male hypopygium with ventral dististyle small, only slightly larger than the basistyle; rostral spines very long and straight, about one-half longer than the prolongation; style with modified black setae along the furrow of the dorsal dististyle, including four more apical ones.

Male. — Length about 7 mm.; wing 6.8 mm.; antenna about 2.5 mm.

Type on slide in balsam. Rostrum and palpi black. Antennae of male with nine long-biflabellate segments, the formula $2 + 1 + 9 + 2$; segments four to twelve each with two long branches, the longest at midlength of the organ, progressively shorter on outer segments, the outermost pair (12) about twice the segment; longest branch (7) nearly three times the segment; antennae black, the pedicels of segments three through thirteen whitened. Head dark brown.

Pronotum brown. Mesonotum and pleura yellowed, heavily patterned with brown. Halteres short, pale, apex of knob slightly darkened. Legs with coxae brown; trochanters yellow; remainder of legs medium brown, outer tarsal segments only slightly darker. Wings generally as in *flabelliformis*, pale brown, costal border with five extensive darker brown areas, the broad interspaces pale; cord and outer end of cell *1st M*₂ broadly seamed with pale brown; several yellowed areas on disk, in virtually all cells excepting *Cu* and *2nd A*; veins brown, darker in the costal markings. Venation: *Sc*₁ ending near two-thirds *Rs*, *Sc*₂ close to tip; *m-cu* at fork of *M*.

Abdominal segments obscure yellow, segment one and broad posterior borders of segments two to seven dark brown, broadest on the proximal segments, segments eight and nine darker brown. Male hypopygium (Fig. 22) with tergite, *t*, transverse, posterior border nearly straight, lateral ends rounded. Basistyle, *b*, with ventromesal lobe large, triangular in outline, the outer angle bearing a large seta. Dorsal dististyle long and slender, apex a slender gently curved spine. Ventral dististyle, *vd*, distinctive, unusually small, only slightly larger than the basistyle; rostral prolongation relatively short, terminating in two long modified setae; rostral spines two, very long, straight, narrowed into acute points, about one-half longer than the prolongation; notch of the style before the prolongation with four long conspicuous black setae, with other similar modified setae on face of style adjoining the dorsal style. Gonapophysis, *g*, with mesal-apical lobe relatively slender, blackened.

Holotype. — ♂, on slide. Fortuna Dam Site, Chiriqui River, Chiriqui Province, Panama, 920 meters, February 1976 (Thomas Aitken).

The closest relative is *Limonia (Rhipidia) flabelliformis* Alexander, with somewhat similarly lengthened flagellar branches, the penultimate flagellar segment two-branched, thus having ten long-branched segments instead of nine as in the present fly. In this

species the ventral dististyle of the hypopygium is unusually small, suggesting the specific name.

***Limonia (Rhipidia) subproctigerica* sp.n.**

Antennae of male with eight biflabellate segments, the first and eleventh only slightly produced; legs dark brown, femoral bases yellowed; male hypopygium with beak of ventral dististyle long and slender, spines basal in position; proctiger with modified blackened bars, as shown.

Male. — Length about 7-7.5 mm.; wing 7.5-8 mm.; antenna about 2.8-3 mm.

Head dark brown, mouthparts and palpi black. Antennae (Fig. 17) black, including the flagellar pedicels; formula $2+1+8+1+2$; first and eleventh flagellar segments only shortly produced, segments two to nine biflabellate, the branch of first segment subequal to body, on succeeding segments longer, the extreme at midlength of the organ, on segments five and six slightly more than twice the segment, segment ten with branch about one-half longer than the segment.

Pronotum dark brown, pretergites yellow. Mesonotal praescutum with a grayish brown central stripe, lateral stripes dull brownish orange, interspaces more infuscated; scutal lobes brownish orange, mesal edge darker brown, central line obscure yellow; scutellum and postnotum dull yellow. Pleura yellow, with a narrow brownish black dorsal longitudinal stripe extending from the cervical region to abdomen, involving the propleura, dorsal anepisternum, pteropleurite and pleurotergite; in paratype the darkened strip paler and less conspicuous. Halteres black, extreme base of stem yellowed. Legs with fore coxae light brown, remaining coxae and all trochanters light yellow; remainder of legs dark brown, femoral bases yellowed. Wings of holotype pale brown, the costal third variegated by five darker brown areas, the outermost being the stigma, the four interspaces whitened; cord and outer end of cell *1st M*₂ seamed with pale brown; veins darker brown, yellowed in the costal interspaces. Venation: *Sc* long, *Sc*₁ ending about opposite three-fifths *Rs*, *Sc*₂ near its tip; free tip of *Sc*₂ and *R*₁ in transverse alignment; *m-cu* at fork of *M*. Paratype with wings almost uniformly brown, the five costal areas and the seam along cord only slightly darker; venation virtually the same, *m-cu* slightly before the cord.

Abdomen chiefly dark brown, intermediate sternites with central part obscure yellow, the smallest area on the seventh segment; hypopygium dark brown. Male hypopygium (Fig. 23) with tergite, *t*, narrowly transverse, posterior border shallowly emarginate. Basistyle, *b*, with ventromesal lobe strongly narrowed outwardly, base of lobe with long setae. Gonapophysis, *g*, erect, with a small subterminal point. Proctiger, *pr*, about as figured.

Holotype. — ♂, Chuspipata, Yungas La Paz, Cochabamba, Bolivia, 3100 meters, January 20, 1976 (Peña). Paratopotype, ♂.

Among the relatively few Neotropical species of the subgenus that have a proctigeral scaffolding of the hypopygium somewhat as in the present fly, the closest ally seems to be *Limonia (Rhipidia) proctigerica* Alexander, of Brazil. This differs in details of colora-

tion of the body and wings, in antennal structure, and in the details of the hypopygium, including the tergite, ventral dististyle and the proctigeral scaffolding.

***Limonia (Geranomyia) cocoensis* sp.n.**

Size small (wing about 4 mm.); general coloration of body brown; head black; thoracic pleura brownish yellow; rostrum relatively short, especially the labial palpi; antennae short; legs brown, darker outwardly; wings pale brown, stigma unusually small, darker brown; longitudinal veins beyond general level of origin of *Rs* with long black trichia; *Sc* short, ending about opposite one-third to one-fourth *Rs*, vein *m* lacking; abdominal tergites brown, sternites yellowed.

Female. — Length, excluding rostrum, about 5 mm.; wing about 4 mm.; rostrum about 2 mm.; antenna about 0.75 mm.

Head and mouthparts brown. Rostrum, especially the labial palpi, short and stout when compared with *aneura*, apices of palpi curved and shortly divergent. Antennae with scape and pedicel pale brown, flagellum brownish black; flagellar segments short-oval, terminal segment with outer end pointed. Head black.

Pronotum brown. Mesonotal praescutum and scutum polished dark brown, margins brownish yellow; median region of scutum and the scutellum yellowed, postnotum dark brown. Pleura almost uniformly brownish yellow. Halteres with stem yellow, knob brown. Legs with coxae and trochanters brown; femora and tibiae light brown, tarsi brownish black. Wings (Fig. 19) pale brown, stigma unusually small, oval, darker brown; veins dark brown. Longitudinal veins beyond general level of origin of *Rs* with long black trichia. Venation: *Sc* ending about opposite one-third to one-fourth the length of the nearly straight *Rs*, *Sc*₁ shortly removed, *m* lacking; in one wing of a single specimen of the extensive series available cell *1st M*₂ is closed; *m-cu* at or shortly before fork of *M*; cell *2nd A* narrow. In *aneura* the degree of wing trichiation is different, in the radial field being restricted to the longitudinal veins beyond the cord, in the medial field even more reduced, especially on veins *M*₁₊₂ and *M*₃, lacking on *M*₄.

Abdomen with tergites brown, sternites yellowed. Ovipositor with valves short, cerci very slender.

Holotype. — ♀, Isla Del Coca, Bahia de Chatham, Costa Rica, January 22, 1967 (Ira L. Wiggins). Paratopotypes, 38 ♀ ♀; in California Academy, and in Alexander Collection.

The only other Neotropical member of the subgenus *Geranomyia* having cell *M*₂ of the wings open as in the present fly is *L. (G.) aneura* Alexander, of Panama (*Studia Entomologica*, 14: 233-234; 1971). This is readily told by the larger size, venation and pattern of the wings, and especially in the trichiation of the wing veins, as discussed above. It should be emphasized that the extensive series of these flies included only females, a common occurrence in light-collected materials.

***Limonia (Geranomyia) picturella* sp. n.**

Rostrum approximately one-half the length of wing; general coloration of mesonotal praescutum obscure yellow, with three narrow dark brown discal stripes and darkened lateral borders; knobs of halteres black; legs with femora light brown with a narrow dark brown subterminal ring, apex and a subterminal ring yellow; wings attractively patterned with brown and white, cells *C* and *Sc* yellow; posterior cells white with a striking dark brown pattern, as described; central area of stigma pale brown; *Sc*₁ ending nearly opposite outer end of *Rs*, the latter unusually short, only slightly exceeding *R*₂₊₃; male hypopygium with the basistyle about one-third the ventral dististyle; rostral prolongation of the latter relatively small, slender, rostral spines two, at and near apex of a slender lobe that is subequal in length to the rostral prolongation.

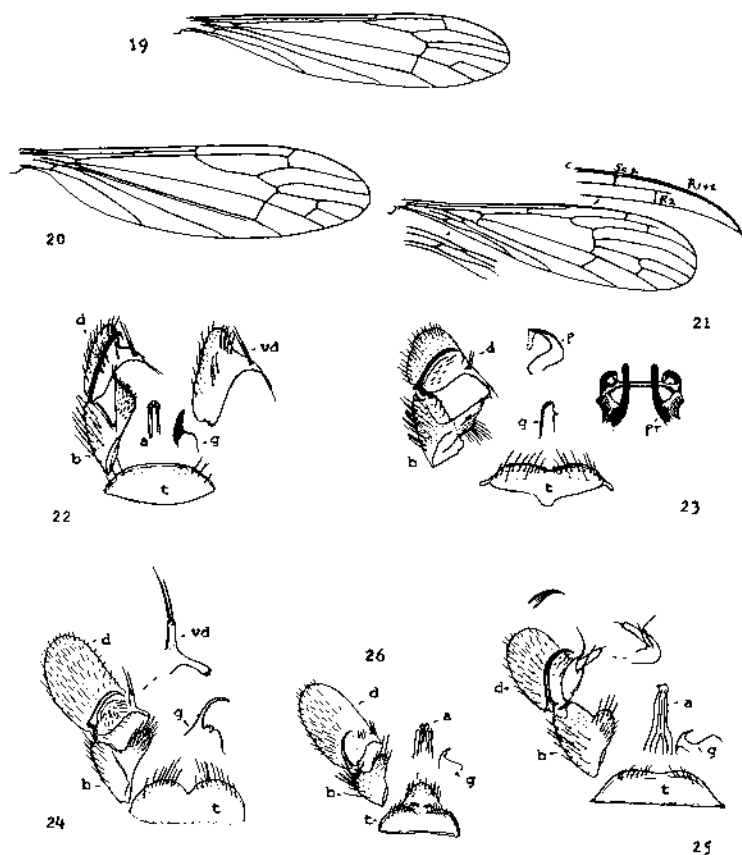
Male. — Length, excluding rostrum, about 8.5 mm.; wing 9 mm.; rostrum about 4.5 mm.

Female. — Length, excluding rostrum, about 8 mm.; wing 8.5 mm.; rostrum about 5 mm.

Rostrum brownish black. Antennae black. Head above gray, on either side of anterior vertex adjoining the eye with a large blackened area, separated medially by a narrow ground vitta.

Pronotum light gray, with a broad median brown stripe. Mesonotal praescutum with ground obscure yellow, sublateral stripes broader, pale silvery yellow; disk with three narrow dark brown stripes that are broader than the interspaces, median stripe ending before suture, laterals crossing the suture onto the inner margins of the scutal lobes; in females lateral praescutal borders broadly dark brown to black, less evident in males; scutum yellowed medially, lobes darker gray, the inner parts dark brown, as described; scutellum very pale gray with a vague central yellow line; postnotum brownish gray, paler brown in male. Pleura chiefly gray to brownish gray, sternopleurite more silvery, especially dorsally. Halteres with stem yellow, knob conspicuously black. Legs with coxae brown, trochanters paler brown; femora light brown, before apex with a narrow dark brown ring, the apex and a more diffuse subterminal ring yellowed; tibiae and basitarsi light brown, outer tarsal segments dark brown. Wings attractively patterned with brown and white, cells *C* and *Sc* yellowed, posterior cells white, slightly more extensive than the heavy brown pattern that is distributed as follows: Prearcular and postarcular, with a small oval white area behind *h*; larger brown areas in cells *C* and *R*, the most basal one at near one-fourth cell *R*, reaching *M* behind; second dark area at origin of *Rs* not attaining *M* behind; third area distinctive, U-shaped, extending from tip of *Sc*, crossing cell *R*₁ over the radial veins, thence extended to *C* over the radial veins, center area of stigma conspicuously paler brown; a major brown area in outer ends of cells *R*₁ through *M*₃; further conspicuous brown seams over outer ends of vein *M*, *M*₁₊₂, and *m-cu*; a narrow darkening over vein *2nd A*, with a small circular marginal spot near base of this cell; outer fourth of *1st A* darkened; veins in ground areas pale, slightly darker in the patterned areas. Venation: *Sc*₁ ending nearly opposite the outer end of *Rs*, the latter unusually short, only slightly exceeding *R*₂₊₃; vein *R*₅ arcuated at base, narrowing *r-m*; cell *1st M*₁ longer than vein *M*₁₊₂; *m-cu* shortly before fork of *M*.

Abdomen dark brown, outer segments and genitalia slightly paler brown. Male hypopygium (Fig. 24) with posterior margin of tergite, *t*, with two broadly rounded lobes, with very long submarginal setae. Basistyle, *b*, about one-third the area of



TEXT-FIGS. 19-26. — Fig. 19, *Limonia (Geranomyia) cocoensis* n.sp., venation; Fig. 20, *Limonia (Geranomyia) wigginsii* n.sp., venation; Fig. 21, *Limonia (Peripheroptera) auranticolor* n.sp., venation; Fig. 22, *Limonia (Rhipidia) pumilistyla* n.sp., male hypopygium; Fig. 23, *Limonia (Rhipidia) subproctigerica* n.sp., male hypopygium; Fig. 24, *Limonia (Geranomyia) picturella* n.sp., male hypopygium; Fig. 25, *Limonia (Geranomyia) wigginsii* n.sp., male hypopygium; Fig. 26, *Limonia (Peripheroptera) auranticolor* n.sp., male hypopygium. Male hypopygium: *a*, aedeagus; *b*, basistyle; *d*, dististyle; *dd*, dorsal dististyle; *g*, gonapophysis; *pr*, proctiger; *t*, 9th tergite; *vd*, ventral dististyle.

the ventral dististyle, ventromesal lobe with abundant setae, the lower and apical ones very long. Dorsal dististyle, *d*, a long slender white rod, terminating in a darkened spine; ventral style, *vd*, large and fleshy; rostral prolongation relatively small, slender, apex with several microscopic spinules; two rostral spines at and near apex of a slender lobe that is subequal in length to the rostral prolongation but slightly stouter. Gonapophysis, *g*, with mesal-apical lobe long and slender.

Holotype. — ♂, Siberia, Cochabamba, Bolivia, 2900 meters, February 18-19, 1976 (Peña). Allotopotype, ♀, with identical data.

The present fly is most similar to species such as *Limonia* (*Geranomyia*) *parilis* Alexander, Ecuador, *L. (G.) neoparilis* Alexander, Bolivia, *L. (G.) gaudens* Alexander, Argentina, *L. (G.) neogaudens* Alexander, Peru, *L. (G.) subgaudens* Alexander, Peru, *L. (G.) forsteriana* Alexander, Bolivia, *L. (G.) sumptuosa* Alexander, Peru, and some others, differing from all in the wing and leg pattern and in details of the hypopygium. The large species *subgaudens* still is known only from the female; this agrees in certain features but differs in venation and in the darkened pattern of the radial field of the wing.

***Limonia* (*Geranomyia*) *wigginsii* sp.n.**

General coloration of thoracic dorsum brownish yellow, praescutum with three narrow brown stripes, pleura yellowed; head brownish black, with a narrow silvery longitudinal stripe; legs with femora yellow with a narrow light brown subterminal ring; wings yellowed, with a restricted light brown pattern, including the stigmal region, cord and outer end of cell *1st M*₂; male hypopygium with ventral dististyle small, only slightly larger than the basistyle; rostral spines of the ventral style from very unequal basal tubercles, the longer one with spine strongly bent beyond base.

Male. — Length, excluding rostrum, about 5 mm.; wing 5 mm.; rostrum about 2 mm.

Female. — Length, excluding rostrum, about 5-5.5 mm.; wing 4-5 mm.; rostrum about 2-2.5 mm.

Rostrum dark brown to black, in male about twice the length of antenna, in female about two and one-half times. Antenna black, flagellar segments oval. Head anteriorly light silvery above, continued caudad as a narrow line over the vertex, remainder of head brownish black, sides sparsely pruinose.

Cervical region and pronotum dark brown. Mesonotal praescutum brownish yellow with three narrow brown stripes, the lateral pair crossing the suture and over the inner part of scutal lobe, the dark lines slightly wider than the ground interspaces; scutal lobes brownish yellow, inner part darkened as described; scutellum brownish yellow. Pleura yellowed, clearer below and on sternum. Halteres with stem yellow, knob darkened. Legs with coxae yellowed, trochanters paler; femora

yellow with a narrow light brown subterminal ring, the yellow apex about twice as extensive; remainder of legs light brown. Wings (Fig. 20) yellowed, with a restricted light brown pattern, including the stigma, a larger area involving the apex of Sc and base of Rs , with narrow paler brown seams over the cord and outer end of cell $1st M_2$; veins in the ground areas and costal field yellow, infuscated in the clouded areas. Wing veins beyond cord with trichia, in some specimens including also Rs and outer ends of longitudinal veins before cord. Venation: Sc_1 ending opposite or shortly before origin of Rs , Sc_2 near tip; supernumerary crossvein in cell Sc distinct; $m-cu$ at or close to fork of M .

Abdominal tergites dark brown, basal sternites yellowed, the outer ones brown. Male hypopygium (Fig. 25) with posterior border of ninth tergite, t , shallowly emarginate, cephalic margin straight. Basistyle, b , with ventromesal lobe small. Ventral dististyle, vd , unusually small, only slightly larger than the basistyle; rostral prolongation narrow, the two rostral spines from basal tubercles, outer spine strongly bent beyond base, the tubercle long; inner spine subequal in length, straight, its basal tubercle very small. Aedaeagus, a , straight, the inner tubes closely approximated to appear single. Gonapophysis, g , with mesal apical lobe terminating in a low acute spine.

Holotype. — ♂, Bahia de Chatham, Isla del Coco, Costa Rica, January 22, 1967 (Ira L. Wiggins). Allotopotype, ♀. Paratopotypes, 9 ♀ ♀, with type; three retained by author.

The species is named for Dr. Ira Loren Wiggins, distinguished botanist, who collected many interesting insects on the Isla del Coco. The fly is allied to *Limonia (Geranomyia) plumbeipleura* Alexander, Ecuador, wide-spread, *L. (G.) marthae* Alexander, Colombia, in northern Andes, *L. (G.) sylvania* Alexander, Dominica, and some others, all having the male hypopygium of a similar type, differing among themselves in hypopygial characters, including the ventral dististyle, tergal characters and in details of structure of the prolongation of the ventral dististyle and its armature.

***Limonia (Peripheroptera) auranticolor* sp.n.**

Size medium (wing of male about 11 mm.); general coloration of thoracic dorsum polished orange, with a restricted polished black pattern, including a median praescutal stripe, with the lateral darkenings reduced to a small circular area on either side; pleura orange, white pollinose ventrally; knob of halteres brownish black; legs with femora brownish yellow, tibiae slightly darker, tarsi dark brown; wings yellow, with restricted pale brown areas, especially in the expanded stigmal region; free tip of Sc_2 far basad of R_1 , R_{1+2} extended.

Male. — Length about 7.5 mm.; wing 11 mm.; antenna about 1.5 mm.

Rostrum light yellow; palpi short, black. Antennae black throughout; flagellar segments progressively longer and more slender outwardly; verticils elongate, especially on outer segments. Head with front yellow, remainder abruptly dark brown above, lighter brown below.

Pronotum yellow, scutum narrowly blackened medially. Mesonotal praescutum polished orange, interspaces with microscopic setulae, median three-fifths with a narrow polished black stripe, sublateral darkenings reduced to a small circular area on either side; scutum orange, each lobe with a single small orange brown area, smaller than the sublateral praescutal darkenings; scutellum and pronotum more yellowish orange, unmarked. Pleura orange, extensively dusted with microscopic whitened pollen, including the mesopleura, pteropleurite and meron; pleural membrane paler yellow. Halteres with stem yellow, knob brownish black. Legs with coxae and trochanters orange; femora brownish yellow, bases clearer yellow, tips vaguely darkened; tibiae yellowish brown; tarsi dark brown; claws with a group of basal spines, short and compact. Wing (Fig. 21) with the ground yellowed, prearcular field and much of cell *Sc* clearer yellow; pale brown darkenings include the entire stigmal area in cells R_1 and R_3 , wing apex slightly clouded; narrow darker brown clouds at arculus, Sc_2 , free tip of Sc_3 , R_2 and the cord, paler brown over the outer end of cell *1st M*; veins yellowish brown to light brown, darker in the patterned areas. Venation: Free tip of Sc_1 far basad of R_2 , the distance greater than the arcuated R_5 ; apical spur of R_{1+2} subequal in length to R_2 ; elements of remainder of cord in transverse alignment; cell *1st M*; slightly longer than distal section of M_{1+2} ; *m-cu* oblique, about one-third its length beyond the fork of *M*; cell *1st M*; long and narrow.

Abdomen brownish yellow, lateral margins narrowly darkened, incisures pale; hypopygium with basistyle and ventral dististyle brownish black. Male hypopygium (Fig. 26) with lobes of tergite, *t*, very low. Basistyle, *b*, relatively small, its area about one-fourth that of the ventral dististyle; ventromesal lobe with long setae on lower face. Proctiger semioval, with numerous long delicate setae. Dorsal dististyle, *d*, a small sickle, narrowed gradually into a spine; ventral dististyle large and fleshy, rostral prolongation a pale flattened blade; rostral spines closely approximated, basal tubercles small.

Holotype. — ♂, El Palmar, Chapare, Bolivia, 900 meters, September 3-6, 1956 (Peña).

The most similar regional species are *Limonia* (*Peripheroptera*) *cochabambae* Alexander, Bolivia, and *L. (P.) fulvistigma* Alexander, Peru, both of which have the venation of the stigmal region and the transverse cord generally as in the present fly. All of these species differ among themselves chiefly in body coloration, as described.

Helius (Helius) eremnophallus sp.n.

Belongs to the *albatarsis* group; general coloration of body dark brown, thoracic pleura paler; antennae nearly three times as long as the short rostrum; legs dark brown, tarsi, including the outer end of basitarsus, snowy white; wings with *r-m* distinct; male hypopygium with basistyle long, dististyles nearly terminal, leaving a small apical tubercle; aedeagus very long and slender, blackened, the sinuous outer end more yellowed.

Male. — Length about 5-5.5 mm.; wing 4.3-4.8 mm.; rostrum about 0.4-0.45 mm.; antenna about 1.3 mm.

Female. — Length about 5-6 mm.; wing 4.5-5 mm.; rostrum about 3.5-4 mm.; antennae about 1.0-1.2 mm.

Described from materials mounted in balsam. Rostrum short, brown; palpi brown, terminal segment longer than the combined two intermediate segments. Antennae relatively long, brown throughout; flagellar segments cylindrical, progressively smaller outwardly, terminal segment very small, oval. Head dark brown.

Thorax above almost uniformly brown, pleura slightly paler brown. Halteres with stem light brown, knob darker. Legs with coxae and trochanters brown; femora and tibiae dark brown, basitarsi broadly brown, the apex and remainder of tarsi snowy white. Wings (Fig. 27) faintly tinged with brown, prearcular region, costal field and stigma pale brown; veins darker. Venation: *r-m* distinct, subequal to or shorter than basal section of R_{4+5} ; *m-cu* slightly variable in position, from about midlength of cell $1st M_2$ to slightly beyond.

Abdomen, including hypopygium, dark brown. Male hypopygium (Fig. 31) with the basistyle, *b*, long, dististyles, *d*, nearly terminal, leaving a small apical tubercle with about five long setae; near base on inner face of style with a concentration of smaller erect setae. Outer-dististyle, *od*, short and straight, apex bidentate, the subterminal point slightly smaller than the apex; inner style, *id*, with the narrowed apex short, about one-half the enlarged base. Interbase, *i*, strongly curved at base. Aedeagus, *a*, distinctive, very long and slender, exceeding the basistyle in length, the more thickened basal half black, the arcuated outer end more yellowed.

Holotype. — ♂, on slide, Fortuna Dam, Chiriqui River, Chiriqui Province, Panama, 920 meters, February 1976 (Thomas Aitken). Allotopotype, ♀, on slide. Paratopotypes, 2 ♂♂, 2 ♀♀, on slides.

Other generally similar regional members of the *niveitarsis* group are most readily distinguished from the present fly by hypopygial structure, especially the very long slender blackened aedeagus. A further species, *Helius (Helius) melanophallus* Alexander, of Ecuador, similarly has the aedeagus blackened, contrasting with allied regional members of the group where the aedeagus is yellowed. This latter species has a short stout aedeagus and with differently shaped dististyles.

Helius (Helius) liguliferus sp.n.

Belongs to the *albitarsis* group; general coloration of body dark brown; rostrum and antennae short; legs with tarsi extensively snowy white; wings with fusion of veins R_{4+5} and M_{1+2} extensive; male hypopygium with ninth segment distinctive, medially with a broad lobe that is provided with strong setae; apex of basistyle long-extended, with very long setae, the area surrounding the bases of the dististyles with abundant microscopic black spinules.

Male. — Length about 5.6 mm.; wing 4.8-5.7 mm.; rostrum about 0.4-0.45 mm.; antenna about 0.9-1.0 mm.

Female. — Length about 5.5-6 mm.; wing 5-5.5 mm.; rostrum about 3.5-4 mm.

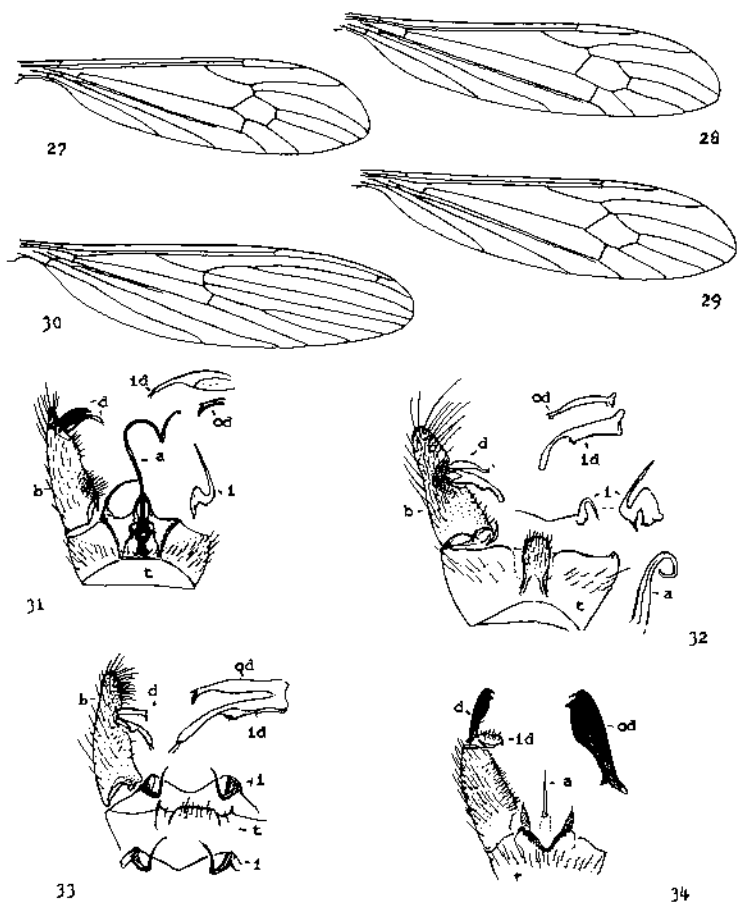
Described from materials mounted in balsam. Head, including rostrum, dark brown; palpi and antennae brown.

Thoracic dorsum dark brown, pleura somewhat paler brown. Halteres brown. Legs with coxae and trochanters dark brown; femora, tibiae and most of basitarsi dark brown, remainder of tarsi white. Wings (Fig. 28) light brown, costal region and stigma very slightly darker brown; veins dark brown. Outer radial and medial veins with trichia, lacking on M_{3+4} , M_4 , and the posterior veins. Venation as shown: Fusion of R_{4+5} and M_{1+2} very extensive, subequal to or slightly longer than the basal section of M_{1+2} ; *m-cu* at midlength of M_{3+4} or beyond, as shown.

Abdominal tergites brown, sternites paler, outer segment darker brown. Male hypopygium (Fig. 32) with ninth tergite, *t*, distinctive; medially with a broad lobe that bears strong setae, apex rounded. Basistyle, *b*, elongate, the conspicuous outer lobe with very long setae on mesal face, other vestiture short; area surrounding the bases of the dististyles with abundant microscopic black spinules. Dististyles, *d*, inserted shortly beyond midlength of basistyle, apex of outer style, *od*, microscopically bidentate; inner style, *id*, longer, the outer two-fifths narrowed into a long paddlelike blade. Interbase, *i*, about as shown, extended into a long straight spine. Aedeagus, *a*, relatively short, outer third strongly curved.

Holotype. — ♂, on slide, Fortuna Dam, Chiriqui River, Chiriqui Province, Panama, 920 meters, February 1976 (Thomas Aitken). Paratopotypes, 2 ♂♂, 3 ♀♀, on three slides, with holotype.

The most similar regional species include *Helius (Helius) quadrivena* Alexander, Panama, which has the venation much the same but with the hypopygial dististyles terminal in position. *H. (H.) quadrifidus* Alexander, Mexico, and *H. (H.) tetracradus* Alexander, Honduras, have the venation and the subterminal dististyles of the hypopygium about as in the present fly but with the other hypopygial details entirely distinct.



TEXT-FIGS. 27-34. — Fig. 27, *Helius (Helius) eremnophallus* n.sp., venation; Fig. 28, *Helius (Helius) liguliferus* n.sp., venation; Fig. 29, *Helius (Helius) protumidus* n.sp., venation; Fig. 30, *Polymera (Polymera) aitkeni* n.sp., venation; Fig. 31, *Helius (Helius) eremnophallus* n.sp., male hypopygium; Fig. 32, *Helius (Helius) liguliferus* n.sp., male hypopygium; Fig. 33, *Helius (Helius) protumidus* n.sp., male hypopygium; Fig. 34, *Polymera (Polymera) aitkeni* n.sp., male hypopygium. Male hypopygium: *a*, aedeagus; *b*, basistyle; *d*, dististyle; *i*, interbase; *id*, inner dististyle; *od*, outer dististyle; *t*, 9th tergite.

***Helius (Helius) protumidus* sp.n.**

Belongs to the *albitarsis* group; general coloration of body varying from medium to darker brown; rostrum short; legs with tarsi extensively snowy white; wings with

fusion of veins R_{4+5} and M_{1+2} , variable, short in the holotype, longer in other specimens of the type series; male hypopygium with posterior border of tergite with a low transverse lobe that bears sparse setae; apex of basistyle long-extended, with very long setae; area surrounding the insertion of the dististyles without blackened spinules.

Male. — Length about 5.5-6.5 mm.; wing 5-6.2 mm.; rostrum about 0.35-0.4 mm.; antenna about 0.9-1.0 mm.

Described from materials mounted in balsam. Rostrum about one-half the length of remainder of head, brown; palpi brown, terminal segment long and slender, exceeding in length the combined second and third segments. Antennae relatively long; flagellar segments long-cylindrical, terminal segment slightly smaller than the penultimate. Head dark brown.

Thorax medium to dark brown, pleura paler brown. Halteres medium brown. Legs with coxae and trochanters brown; remainder of legs dark brown to nearly black, including most of basitarsi, the distal third to fourth of the latter snowy white. Wings (Fig. 29) light brown, costal region and stigma slightly darker brown; veins brown. Venation as shown; fusion of vein R_5 and M_{1+2} unusually variable, in the holotype short and slightly variable in the two wings, one wing about as shown, in the other wing punctiform, barely eliminating $r-m$; paratypes with fusion of these veins longer, subequal to vein M_{1+2} beyond it; $m-cu$ at or beyond midlength of M_{3+4} .

Abdomen brown, hypopygium darker brown. Male hypopygium (Fig. 33) with ninth tergite, t , terminating in a low central lobe, the apex truncate, surface with sparse setae. Basistyle, b , elongate, the outer lobe with conspicuous erect setae on mesal face; no darkened spinules at insertion of dististyles. Dististyles, d , as shown; outer style, od , terminating in two unequal spines; inner style, id , with the outer end paddlelike, subequal in length to the base. Interbases, i , at lateral ends of a long central plate. Aedeagus short, outer half widened, apex decurved.

Holotype. — σ , on slide, Fortuna Dam, Chiriqui River, Chiriqui Province, Panama, 920 meters, February 1976 (Thomas Aitken). Paratopotypes, 3 σ , on slides, with type.

The most similar regional species include *Helius* (*Helius*) *quadrifidus* Alexander, Mexico, *H. (H.) quadrivena* Alexander, Panama, *H. (H.) tetracradus* Alexander, Honduras, and the presently described, *H. (H.) liguliferus* sp.n., likewise from Panama, all species being most readily distinguished by hypopygial characters, as described and figured.

Polymera (Polymera) aitkeni sp.n.

Allied to *niveitarsis*; size very large (male, wing 9 mm.; antenna 13.8 mm.); general coloration of body brown, thoracic pleura more yellowed; antennae of male very long, flagellar segments only slightly modified; wings uniformly pale brown, stigma lacking; cord of wing far basad, before midlength, cell M_1 lacking; male hypopygium with apex of outer dististyle bidentate.

Male. — Length about 9 mm.; wing 9 mm.; antenna 13.8 mm.

Described from type mounted in balsam. Rostrum and palpi brown, terminal palpal segment more slender, about twice the length of the penultimate. Antennae black; very long, as shown by measurements, about one-half longer than the body or wing; flagellar segments long-subcylindrical, nearly equal in diameter throughout, the bases very slightly dilated; vestiture of flagellar segments almost completely lost through immersion in spirits and contacts, a few very long verticillate hairs remain on first flagellar segment; at near two-fifths the length of segment supplementary small stouter setae remain on all segments. Head dark brown.

Thoracic dorsum brown, praescutum and postnotum appearing paler than the scutum; pleura more yellowed. Halteres brown. Legs light brown; outer tarsal segments broken but apparently concolorous with remainder of leg, not whitened as in many species. Wings (Fig. 30) with membrane very pale brown throughout with no indication of a stigma; veins darker brown. Venation: R_s slightly longer than R_{2+3+4} , in direct alignment with R_3 ; R_7 far distad, about one-half R_{1+2} ; cell M , lacking, M_2 deep; $m-cu$ about its own length beyond fork of M .

Abdominal tergites dark brown, still darker laterally, sternites more yellowed. Male hypopygium (Fig. 34) having the posterior border of tergite, t , with a deep U-shaped emargination, the lobes farther extended into a narrow blade, the tip acute. Basistyle, b , with mesal face set with abundant setae, the more basal ones longer. Dististyles, d , terminal, outer style, od , blackened, basal third narrowed, apex with two points, the outer a slender subappressed spine; inner style, id , with conspicuous erect setae. Aedeagus, a , a very slender straight pale rod, extended outwardly into a hairlike point.

Holotype. — ♂, on slide, Fortuna Dam, Chiriqui River, Chiriqui Province, Panama, 920 meters, February 1976 (Thomas Aitken).

I take great pleasure in naming this conspicuous fly for Dr. Thomas H. G. Aitken who collected the type and many other new and rare species of craneflies in Panama and elsewhere in Tropical America. The fly is the largest known member of the genus. The most similar species are *Polymera (Polymera) niveitarsis* Alexander, Guatemala, south to Peru and Brazil, and *P. (P.) anticalba* Alexander, of Brazil, with generally similar male antennae and venation, differing in the loss of cell M_1 of the wings and in other venational details, including the long vein R_{2+3+4} and the longer veins beyond the cord. Attention is called to *P. (P.) regina* Alexander, Paraguay, which similarly is a large conspicuous species that lacks cell M_1 of the wing, differing in other venational details, especially the veins and cells beyond the cord that are quite distinct from the condition found in the present fly.

Gynoplistia (Gynoplistia) basituberosa sp.n.

Allied to *variicalcarata*; size larger (wing to 15.2 mm.); antennae 19-segmented, with 12 branched segments; body gray, praescutum with four slightly darker gray stripes; halteres yellowed; wings yellow, the stigma and a small cloud over the basal section of R_s brown; no darkening at origin of R_s .

Male. — Length about 15-17 mm.; wing 13.5-15.2 mm.; antenna about 4-4.5 mm.

Rostrum gray pruinose, with long white setae; palpi brown to dark brown, terminal segment slender, about one-half longer than the penultimate. Antennae black, the pedicel and first flagellar segment paler; 19-segmented, the formula $2+2+10+5$; flagellar branches of moderate length, the longest (segments six to eight) between one-third and one-fourth the length of the antenna. Head light gray, clearer anteriorly; a low tubercle immediately behind each antennal fossa.

Pronotum gray. Mesonotal praescutum light gray with four slightly darker gray stripes, pseudosutural foveae black; scutal lobes chiefly medium gray, scutellum and postnotum light gray pruinose. Pleura clear light gray, dorsopleural membrane buffy. Halteres yellowed, knobs slightly infuscated. Legs with coxae light gray; trochanters yellow; femora yellow, outer half weakly darkened; tibiae and tarsi light brown, terminal tarsal segment brownish black. Wings (Fig. 35) yellowed, prearcular and costal fields somewhat clearer yellow; stigma light brown; a small circular slightly darker brown cloud over basal section of R_s ; no darkening at origin of R_s ; veins dark brown. Veins posterior to R chiefly glabrous, beyond cord with about 15 trichia on outer two-thirds of distal section of vein R_s , and, in cases at extreme outer end of M_1 . Venation as shown; R_s long, angulated shortly beyond origin, with a small spur.

Abdomen dark brown, gray pruinose, extreme lateral borders of tergites paler. Male hypopygium (Fig. 39) very similar to that of *variicalcarata*, as figured.

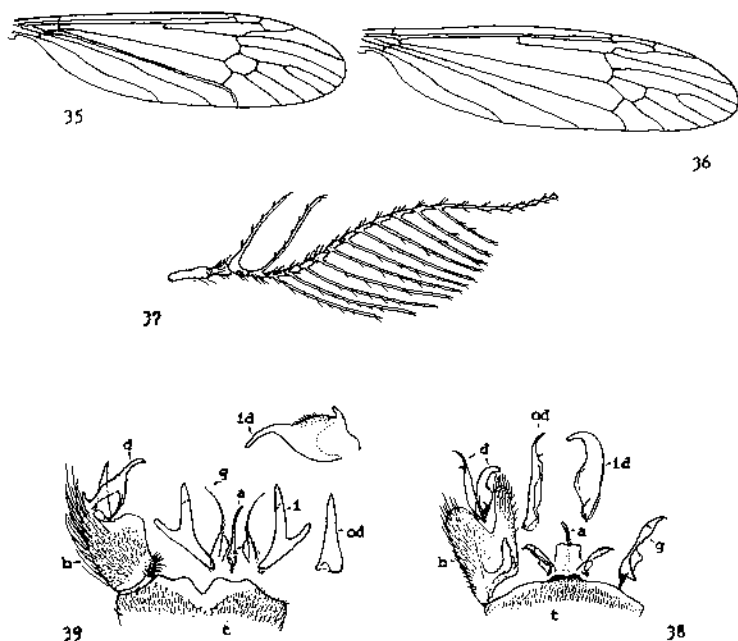
Holotype. — ♂, on slide, Las Trancos, Nuble, Chile, 1400 meters, December 14, 1976 (Peña). Paratopotype, ♂. Paratype, ♂, La Fusta, Malleco, 1200 meters, December 31, 1967 (Peña).

Although the present fly is very similar to *Gynoplistia variicalcarata* Alexander in hypopygial characters, it differs in the large size, number of antennal segments, and in details of wing coloration, including no darkened area at origin of R_s .

Gynoplistia (Gynoplistia) gloriosa sp.n.

Size large (wing of male about 22 mm., body length 32 mm.); abdomen very long, exceeding the wing; antennae 20 to 21 segmented with 13 branched segments; legs brown, inconspicuously patterned; wings pale yellow, strikingly patterned with brown on the proximal three-fourths; R_s long; male hypopygium with outer dististyle slender, with a small subterminal spine.

Male. — Length about 31-32 mm.; wing 21.5-22 mm.; abdomen about 27.5-28 mm.; antenna about 4.5-4.6 mm.



TEXT-FIGS. 35-39. — Fig. 35, *Gynoplistia (Gynoplistia) basituberosa* n.sp., venation; Figs. 36, 37, 38, *Gynoplistia (Gynoplistia) gloriosa* n.sp., venation, male antenna, male hypopygium; Fig. 39, *Gynoplistia (Gynoplistia) basituberosa* n.sp., male hypopygium. Male hypopygium: *a*, aedeagus; *b*, basistyle; *d*, dististyles; *g*, gonapophysis; *i*, interbase; *id*, inner dististyle; *t*, 9th tergite.

Frontal prolongation of head light brown, darker above, with conspicuous long setae; palpi black, all segments subequal in length. Antennae of male (Fig. 37) 20-21-segmented, the formula in holotype $2+2+11+6$, in paratype $2+2+11+5$, with thirteen branched segments; branch of third segment slightly longer than the last branch, longest branches at near midlength of organ; scape and pedicel black; proximal 3 flagellar segments with the long branches obscure yellow, narrowly darkened basally, succeeding segments black with the extreme base yellowed, outer simple segments uniformly blackened; terminal segment longer than the penultimate, constricted at midlength. Head with the relatively narrow anterior vertex dark brown, remainder of vertex and the occiput brownish black with a narrow silvery line adjoining the posterior border of eye.

Pronotum orange with a whitish pruinosity, variegated with black medially and on sides. Mesonotal praescutum yellowed with three darker stripes, the central one darker on anterior half with a vague paler capillary line on central half, sides of

praescutum broadly more depressed, blackened behind; scutal lobes obscure yellow, on anterior half vaguely patterned with brown, central area and the scutellum light gray, parascutella more obscure yellow; postnotum obscure brownish yellow, mediotergite broadly pruinose, with a narrow black central area. Propleura surrounding the anterior spiracle blackened, narrowly bordered by pale. Mesopleura brown and black dorsally, sternopleurite pale, with an oblique narrow silvery stripe extended dorsad over the metapleura onto the pleurotergite. Halteres long, stem whitened, knob very pale brown. Legs with fore and middle coxae more yellowed pollinose; trochanters blackened; femora light brown, broadly more blackened subterminally; tibiae brown, tips narrowly blackened; tarsi light brown, terminal segment darker. Tibial spur formula $0+2+2$, spurs long and conspicuous, especially the posterior pair. Wings (Fig. 36) of type pale yellow, strikingly patterned with brown on the proximal three-fourths; cells *C* and *Sc* uniformly light yellow, except basad of the humeral crossvein; three conspicuous irregularly shaped marks in cell *R*, brown, margins narrowly more darkened; cell *M* almost clear, with a longitudinal very pale brown central wash, cell *Cu* similar, with a very small central darkening; Anal cells pale, each with two conspicuous brown areas; stigma light yellow, darkened at either end, the basal area extended caudad across cells *R*₃ and *R*₄; an isolated small marginal brown spot over *R*₁₊₂; three isolated brown marginal spots in cells *R*₃ and *R*₄; vein *R*₅ narrowly seamed with brown over its entire length, reaching tip at wing apex; a small pale brown spot in center of cell *1st M*₂, with comparable areas in cells *R*₃, *M*₂, *M*₃, and *Cu*; outer fourth of wing virtually unpatterned; veins brown. In the paratype the darkened wing patterned is virtually the same but more intense in outer radial, cubital and anal fields. Venation as shown; *R*₅ long, angulated and short-spurred at origin, in longitudinal alignment with the short element *R*₂₊₃₊₄; vein *R*₂₊₃ long, sinuous; veins *R*₂ and *R*₁₊₂ short, subequal, *R*₂ straight; *m-cu* at near two-thirds cell *1st M*₂; vein *Cu*₂ not apparent.

Abdomen very long, as shown by the measurements, exceeding the wing in length; basal tergites dark brown, medially light pruinose, succeeding tergites light brown, darker laterally, extreme margins narrowly pale; sternites paler yellowish brown; hypopygium dark brown. Male hypopygium (Fig. 38) with posterior border of tergite, *t*, produced into a narrow more darkened central lobe. Outer dististyle, *od*, slender, outer third more narrowed into a spine, with a smaller point at its base; inner style, *id*, broader on basal half, the outer end strongly curved, apex obtuse. Gonapophysis, *g*, narrow, outer half more slender, terminating in a spine.

Holotype. — ♂, Cabreria, Nahuelbuta, Malleco, Chile, 1100 meters, January 15-20, 1977 (Peña). Paratopotype, ♂, January 9-10, 1977 (Peña).

This striking species is most similar to *Gynoplistia* (*Gynoplistia*) *costospilota* Alexander, Chile, *G. (G.) peñana* Alexander, Chile, and *G. (G.) schachovskoyana* Alexander, Argentina (Neuquen), all readily distinguished among themselves by the wing pattern and in details of structure of the antennae and male hypopygium.

Hexatoma (Eriocera) setosivena sp. n.

Head dull black; thoracic dorsum blackened, praescutum yellow, with four polished orange stripes; dorsal pleurites and membrane blackened, sternopleurite, meron, coxae and trochanters orange, remainder of legs brownish black; wings light brown, prearcular and costal fields darker brown, the small stigma darker brown; longitudinal veins in outer radial and medial fields with long conspicuous trichia, more sparse on vein M_4 ; Sc_1 ending opposite fork of R_{2+3+4} ; abdominal tergites brownish black, proximal sternites and hypopygium yellow, outer sternites brownish black.

Male. — Length about 14 mm.; wing 12.5 mm.; antenna about 3 mm.

Rostrum black, gray pruinose; palpi black. Antennae dark brown, 7-segmented; all flagellar segments long-cylindrical, progressively shorter outwardly, all with long conspicuous setae, especially on lower face. Head dull black, sparsely pruinose; vertical tubercle entire, more heavily pruinose; eyes conspicuous.

Prothorax blackened. Mesonotal praescutum yellow, with four more polished orange stripes, the intermediate pair narrowly margined with darker orange; scutum polished black, scutellum and the entire postnotum less conspicuously blackened. Dorsopleural membrane, anepisternum and the extreme dorsal margin of pleura blackened, sternopleurite and meron abruptly orange. Halteres black. Legs with coxae and trochanters orange; remainder of legs dark brown to brownish black, femoral bases not brightened. Wings light brown, prearcular field and cells C and Sc darker brown, the small long-oval stigma darker brown; veins dark brown. Most longitudinal veins beyond cord with long conspicuous trichia, including the radial and medial fields, more sparse on vein M_4 , veins before cord and posterior to R glabrous. Venation: Sc_1 ending opposite the fork of R_{2+3+4} ; cell $1st M_2$ rectangular, with $m-cu$ at midlength.

Abdominal tergites brownish black, second segment vaguely more yellowed; proximal sternites light yellow, outer sternites brownish black; hypopygium yellow.

Holotype. — ♂, Finca Monteguini, Chicacao, Guatemala, 3500 feet, July 4, 1949 (Thomas H. Farr).

In its general appearance the present fly is most like *Hexatoma (Eriocera) haemorrhoea* (Osten Sacken) and *H. (E.) mesoxantha* (Osten Sacken), both described from Mount Orizaba, Mexico, collected by Sumichrast. The latter is most similar to this fly, differing in the venation of the radial and medial fields of the wings and especially in the trichiation of the wing veins, lacking trichia on all veins posterior to R with the exception of four or five scattered punctures on the distal section of R_5 .

Shannonomyia crepera sp. n.

General coloration of head and thorax dark brown, gray pruinose, abdomen more uniformly dark brown; antennae very small; knobs of halteres dark brown; legs

yellowish brown to pale brown; wings light brown, vaguely patterned with darker brown and more hyaline areas in the regions of the stigma and cord; cell *1st M*₂ long and narrow, with *m-cu* at near one-third to one-fourth the length; elements of cord transverse; male hypopygium with tergal lobes very broad, subtruncate; interbase a small curved horn; dististyles slender; aedeagus relatively short, gently sinuous, not convoluted.

Male. — Length about 5.5-6 mm.; wing 4.5-5 mm.; antenna about 0.7-0.8 mm.

Rostrum and palpi black. Antennae small; scape and pedicel large, dark brown, flagellum paler, obscure yellow, short and slender, the outer segments longer. Head brown, gray pruinose.

Thorax almost uniformly gray, praescutum with three very pale brown stripes, scutal lobes weakly darkened. Halteres with stem obscure yellow, knob dark brown. Legs with coxae and trochanters obscure yellow; remainder of legs yellowish brown to pale brown. Wings (Fig. 40) pale brown, vaguely patterned with darker brown and more whitened areas, the latter in the regions of the stigma and cord, the latter brown; veins light brown. Trichia on veins *R*, *R*₄, *R*₅, *M*₁₊₂ and *M*₃, veins basad of cord glabrous. Venation: *Sc*₁ ending shortly before to nearly opposite the fork of *Rs*; *R*₂ at or before the upper radial fork; elements of cord transverse; cell *1st M*₂ long and narrow, subequal to or somewhat shorter than the outer section of vein *M*₁₊₂; *m-cu* about opposite one-third to one-fourth the length of cell *1st M*₂.

Abdomen dark brown. Male hypopygium (Fig. 46) with posterior border of tergite, *t*, with two very broad subtruncate lobes, the emargination small. Basistyle, *b*, with the interbase, *i*, a small curved horn. Outer dististyle, *od*, slender, outwardly extended into a narrow blackened spine; outer margin near apex with a similar subterminal more narrowed point; inner dististyle, *id*, slender. Aedeagus, *a*, relatively short, only slightly sinuous, not convoluted, with a flattened lateral flange.

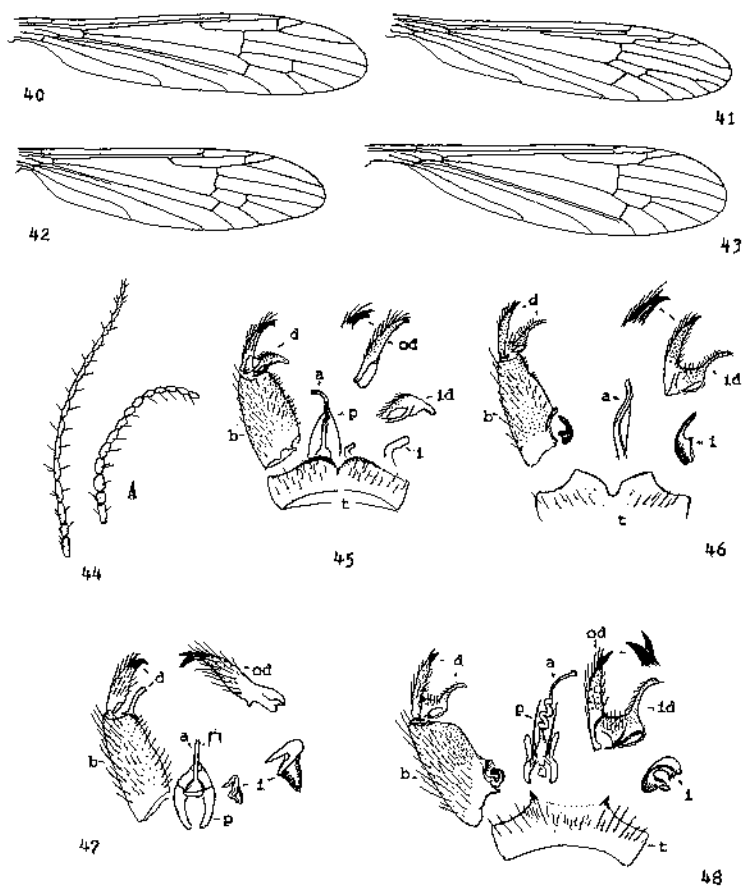
Holotype. — Sur Rio Tricua, Alto Beni, Bolivia, January 15-18, 1976 (Peña). Paratopotypes, 2 ♂♂, with type.

Most similar to species such as *Shannonomyia argenteiceps* Alexander, Panama, Ecuador, *S. cingara* Alexander, Peru, and *S. providens* Alexander, Venezuela, differing in details of wing coloration and venation and especially in hypopygial structure.

***Shannonomyia evanescens* sp.n.**

General coloration of head and thorax light gray, abdominal tergites brownish gray, sternites and hypopygium yellowed; legs with femora obscure yellow, tips broadly blackened, tibiae and basitarsi yellow; wings yellow, with a very pale brown spotted to weakly reticulated pattern; *Rs* long, subequal to its anterior branch; cell *M*₁ present; male hypopygium with tergal lobes very low and broad.

Male. — Length about 8-9 mm.; wing 9-10 mm.; antenna about 1.7-1.8 mm.



TEXT-FIGS. 40-48. — Fig. 40, *Shannonomyia crepera* n.sp., venation; Fig. 41, *Shannonomyia evanescens* n.sp., venation; Fig. 42, *Shannonomyia galindoi* n.sp., venation; Fig. 43, *Shannonomyia lignyptera* n.sp., venation; Fig. 44, *Shannonomyia setulicornis* Alexander, male antenna; Fig. 45, *Shannonomyia evanescens* n.sp., male hypopygium; Fig. 46, *Shannonomyia crepera* n.sp., male hypopygium; Fig. 47, *Shannonomyia galindoi* n.sp., male hypopygium; Fig. 48, *Shannonomyia lignyptera* n.sp., male hypopygium. Male hypopygium: a, aedeagus; b, basistyle; d, dististyles; i, interbase; id, inner dististyle; od, outer dististyle; p, phallosome; t, 9th tergite.

Rostrum pruinose; palpi black. Antennae short, brownish black; proximal four or five segments enlarged, the outer ones abruptly smaller, with long verticils. Head brownish gray.

Pronotal scutum gray, restrictedly patterned with brown, including a central stripe, scutellum obscure yellow. Mesonotum light gray, praescutum with two approximated brown stripes, lateral pair paler; scutal lobes weakly patterned with brown, pleurotergite more yellowed. Pleura light gray. Halteres elongate, yellow, knob weakly darkened outwardly. Legs with coxae and trochanters yellow; femora obscure yellow, tips broadly blackened; tibiae and basitarsi yellow, tips darkened, remainder of tarsi black. Wings (Fig. 41) yellow; veins light brown; a very pale brown spotted pattern in basal cells, somewhat more reticulated in cells beyond cord; certain proximal wing cells with the darkened pattern much reduced to quite lacking; holotype and others of type series with a concentration of darkened dots along vein R_3 , in both cells R_4 and R_5 , forming linear streaks. Venation: R_5 long subequal to or slightly longer than the anterior branch of R_5 ; cell M_1 present; cell $1st\ M_2$ long, $m-cu$ at or beyond midlength.

Abdominal tergites brownish gray, sternites more obscure yellow; hypopygium large, yellow, much paler than in *reticularis*. Male hypopygium (Fig. 45) about as figured. Lobes of tergite, t , very low and rounded, the notch acute. Outer dististyle, od , narrowed gradually to the bispinous blackened tip, outer spine slightly longer and more slender. Interbase, i , shaped like a boomerang, outer end obtuse. Phallosome, p , with aedeagus relatively short, the free apex gently curved, the subtending flanges broad.

Holotype. — Tarqui, Ecuador, 2800 meters, March 8, 1965 (Peña). Allotopotype, ♀. Paratopotypes, 4 ♂♂. Paratype, ♂, Carchi, Troya, Ecuador, 2900 meters, June 13, 1965 (Peña).

Shannonomyia evanescens is generally similar to *S. reticularis* Alexander, differing especially in the coloration of the legs and wings and in details of body coloration and hypopygial structure. Despite some marked similarities between the two I believe that distinct species are involved.

Shannonomyia galindoi sp.n.

General coloration of body dark brown; legs light brown, outer tarsal segments darker; wings brownish yellow, with a sparse light brown pattern; male hypopygium with apex of outer dististyle unequally bifid; gonapophyses very small; aedeagus short, straight, apex truncated.

Male. — Length about 5.5-6 mm.; wing 5-5.5 mm.; antenna about 1.8-2 mm.

Female. — Length about 5.5-6 mm.; wing 5-5.2 mm.

Described from materials mounted in balsam. Rostrum and palpi dark brown. Antenna (Fig. 44) of moderate length; scape and pedicel light yellow, flagellum dark brown; flagellar segments long-oval, lower face slightly produced; segments with dense short yellow setulae, the major verticils darkened, about one-half the

segments. The antenna of *setulicornis* is shown for comparison (Fig. 44 A). Head dark brown.

Thoracic dorsum dark brown, pleura paler, especially ventrally. Halteres with the large knobs whitened. Legs with coxae yellow, trochanters paler yellow; remainder of legs light brown, outer tarsal segments darker. Wings (Fig. 42) brownish yellow with a restricted light brown pattern, including the stigma and more restricted areas at origin of R_s and over the cord; veins light brown. Venation: Sc_1 ending about opposite four-fifths R_s , Sc_2 near its tip; veins R_3 and R_4 strongly divergent, cell R_3 at margin exceeding four times that of cell R_2 ; vein R_2 variable in position, in cases only slightly beyond the fork of R_{2+3+4} , in others, including the holotype, more than one-half its length beyond.

Abdomen dark brown, eighth and base of ninth segments more yellowed. Male hypopygium (Fig. 47), about as shown. Outer dististyle, *od*, unequally bifid at apex, the outer point shorter; inner style long and slender. Interbase, *i*, very small. Aedeagus, *a*, short, straight, apex truncated.

Holotype. — ♂, on slide. Fortuna Dam Site, Chiriqui River, Chiriqui Province, Panama, 920 meters, February 1976 (Thomas Aitken). Allotopotype, ♀. Paratopotypes, 6 ♂ ♀.

The species is named for Pedro Galindo who was of great help to Dr. Thomas Aitken in his 1976 visit to Panama. The detailed account of this trip by Dr. Aitken is of very great interest and importance. It still is in manuscript but presumably will be published. The primary purpose of the trip was to study five families of biting flies of Panama (Culicidae, Ceratopogonidae, Simuliidae, Phlebotominae and Tabanidae). Señor Pedro Galindo is the present Director of the Gorgas Memorial Laboratory.

There are various other regional species of *Shannonomyia* known from Panama, including *S. exilostyla* Alexander, *S. lipernes* Alexander, *S. microstyla* Alexander, and *S. setulicornis* Alexander, (see *Studia Entomologica*, 14: 242-246; 1971). These species differ among themselves in antennal length and structure, wing pattern, and especially in details of hypopygial structure, as further discussed in the above reference. In the present fly the very small gonapophyses, and the short straight aedeagus provide distinctive characters.

Shannonomyia lignyptera sp.n.

General coloration of entire body dark brown; legs brownish black; wings almost uniformly light brown, costal border and stigma slightly darker; R_s long; male hypopygium with tergal lobes appearing as small points; interbase small, strongly

convoluted; outer dististyle slender, with a small subapical spine; phallosome with the aedeagus strongly convoluted.

Male. — Length about 6 mm.; wing 6.3 mm.; antenna about 1.2 mm.

Rostrum and palpi dark brown. Antennae with scape and pedicel dark brown, flagellum paler brown; proximal flagellar segments short-oval, succeeding segments slightly more elongate, terminal segment about one-third longer than the penultimate. Head dark brown.

Thorax brown, praescutum with a darker brown central stripe. Halteres with knob brown, stem slightly paler. Legs with coxae and trochanters brownish yellow; remainder of legs brownish black, outer segments more intensely blackened. Wings (Fig. 43) almost uniformly light brown, costal border and the small stigma very slightly darker brown; veins light brown. Longitudinal veins beyond cord with abundant trichia, sparse or lacking on R_{1+2+3} and M_{1+2} , Rs and outer end of Cu with trichia. Venation: Rs long; elements of cord in transverse alignment, $r-m$ straight; $m-cu$ at near midlength of cell $1st M_2$.

Abdomen dark brown, the outer segments, including hypopygium, more blackened. Male hypopygium (Fig. 48) with tergite, t , transverse, lateral angles of the posterior extension appearing as small points (central portion damaged in the unique type and not shown in figure). Basistyle, b , with interbase, i , small, strongly convoluted, about as shown. Outer dististyle, od , slender, narrowed apically into a small stout spine, before tip with a more slender suberect spine; inner style, id , unusually slender. Phallosome, p , with aedeagus relatively long, strongly convoluted.

Holotype. — ♂, Yungas, Chapare, Cochabamba, Bolivia, 2900 meters, January 29-31, 1976 (Peña).

Shannonomyia lignyptera is generally similar to *S. cerebereana* Alexander, Ecuador, differing especially in the closed cell $1st M_2$ and the presence of sparse macrotrichia in the outer wing cells, as well as hypopygial differences, including the tergite, dististyles and interbase.