

Notes on the Tipulidae of Ecuador

(ORDER DIPTERA) PART IV

By Charles P. Alexander,
University of Massachusetts,
Amherst, Massachusetts.

The preceding article under this general title was published in July 1953 (Rev. Ecuat. Ent. Par. 1 (3): 29 — 41, figs. 1 — 9). In the present report and the one to follow I wish to discuss the Ecuadorian species of the subgenus *Geranomyia* in the great genus *Limonia* Meigen. To this date 31 species of *Geranomyia* have been taken in Ecuador and there are fully as many more known from the adjoining and nearby South American republics that must be considered as being regional. Further, there will be additional novelties to be discovered but it is not believed that these will be very numerous. In the present paper I wish to introduce the subgenus and discuss 9 of the species, the remainder to be considered in Part V of these Notes.

LIMONIA MEIGEN GERANOMYIA HALIDAY

Geranomyia Haliday; Ent. Mag., 1: 154, 1833; (type unicolor Haliday).

Limnobiorrhynchus Westwood; Ann. Soc. Ent. France, 1835: 683, 1835; (type brasiliensis Westwood).

Aporosa Macquart; Dipt. exot., 1, pt. 1: 62, 1838; (type canariensis Bergroth, as maculipennis Macquart, preoccupied).

Rev. Ecuat. Ent. Par. 1 (4) Octubre 1953.

- Plettusa Philippi*; Verh. zool.— bot. Ges. Wien, 15: 597, 1865; (type *valida* Loew, as *virescens* Philippi).
- Geranomyia (Triphana) Skuse*; Proc. Linn. Soc. New South Wales, (2) 4: 777, 1889; (type *lutulenta* Skuse).
- Geranomyia (Teraphana) Skuse*; Linn. Soc. New South Wales, (2) 4: 778, 1889; (type *skuseana* Alexander, as *fusca* Skuse, preoccupied).
- Geranomyia (Monophana) Edwards*; Trans. Linn. Soc. London, (2, Zool.) 15: 200, 1912; (type *immaculata* Edwards).
- Geranomyia (Proaporosa) Alexander*; Proc. Linn. Soc. New South Wales, 47: 582, 1922; (lapsus for next group below).
- Geranomyia (Pseudaporosa) Alexander*; Ann. Mag. Nat. Hist., (9) 13: 177 — 178, 1924; (type *circipunctata* Brunetti, as *venustithorax* Alexander).
- Parageranomyia Santos Abreu*; Mem. Real Acad. Cienc. y Artes Barcelona, (3) 18: 68 — 69, 1923; (type *palmensis* Santos Abreu).

The subgenus *Geranomyia* is one of the most characteristic divisions of the vast genus *Limonia*. It is represented by many species that are most numerous in the American Tropics, with fewer species in the Holarctic, Ethiopian, Oriental and Australasian Regions, being absent in New Zealand and on many of the islands of the Pacific Ocean. These are the commonest and most familiar of the "beaked" crane-flies, in many species having the rostrum from one-third to one-half the length of the remainder of the body. Unlike the *Culicidae*, with which they are sometimes confused by beginning students of insects both sexes possess the beak and it is used to suck nectar from tubular flowers in a considerable range of plant families, including the *Lauraceae*, *Umbelliferae* and *Compositae*.

The immature stages of several species are now known and all are very similar in general appearance to one another and likewise show a close relationship to *Dicranomyia* and some other subgenera of the genus *Limonia*. The larvae of most of the known species occur in constantly wet to shallowly submerged films of algae growing on or over wooden, stone or concrete spillways, pilings, drinking fountains or similar habitats. The larvae are to be found on the vertical faces of such structures, forming silken, gelatinous tubes among the algal filaments, upon which they feed. For pupation a cocoon-like

sheath is formed in the mouth of the larval tube. Still other species are found among wet mosses, liverwort thalli or in saturated algal mats. Two European species have a marine habitat. Only one of the local species have a marine habitat. Only one of the local species has been reared and since it has a life-history quite different from any of the above, it may well be surmised that a wide variation in larval and pupal habitats actually occurs and that many surprising life-histories may be found when this phase of the subject is more studied. Major R. W. G. Hingston (A Naturalist in the Guiana Forest, p. 332, 1932; copied by Edwards, Ann. Mag. Nat. Hist., ser. 10, 14: 634, 1934) writes as follows: "It seems to be unknown that any kind of Diptera go in for making pensile nests. But in the forest there was a crane-fly, *Geranomyia*, which suspended its pupa in a globule of jelly wrapped around the tip of a turu palm leaf. The globule was a firm gelatinous substance, rather smaller than a hazel-nut and as clear as water. Indeed, its appearance was that of a large drop of water about to fall from the end of the palm leaf. It was oval in shape, broader above and pointed below, and was wrapped completely round the thready leaf about half an inch from its extreme tip". Edwards described the species as *Limonia* (*Geranomyia*) *gelatifex*, with the indication that it was perhaps the earlier described *L. (G.) recondita* (Alexander), which has proved to be the case. The species will be discussed under the succeeding part of this series of papers.

Male hypopygium. Very particular attention is devoted to these structures and all of the local species will be described and figured in these two reports, none of them having been illustrated previously.

Ninth tergite. Usually transverse, widest across the base or cephalic end, narrowed outwardly, the posterior border commonly more or less emarginate, in the majority of species forming rounded lobes that are provided with abundant setae, these continued down the sides to near the base of the sclerite; margin of tergal plate usually thickened and sclerotized, the apex of the lobe more extensively so.

Proctiger. A delicate membranous sheet, the surface with abundant microscopic setulae.

Ninth sternite. Commonly a semioval plate provided with strong setae, evidently with a fairly definite chaetotaxy in each spe-

cies; in cases the setae marginal, with certain ones much stronger and arranged in pairs; other species have the setae chiefly discal with the margins narrowly glabrous. Outline of the sternite commonly regularly semioval, in other cases very broadly so; in rarer cases the structure very long and narrow, with relatively few but powerful setae (reaching an extreme in *diabolica*). In some earlier papers, this structure had been confused with the proctiger, due to the close approximation of all parts in microscopic slide mounts.

Basistyle. In virtually all regional species much smaller than the ventral dististyle, in extreme cases only about one-fourth the size.

Dorsal dististyle. A gently curved slender sickle, the tip commonly acute.

Ventral dististyle. Usually a large to very large oval structure, in *lachrymalis* smaller than the basistyle; rostral prolongation varying greatly in size and shape, furnishing the most important specific characters; usually with two spines, more rarely with a single one; very commonly the spines arise from long basal tubercles, either individual or more rarely from a common one.

Gonapophysis. Usually with the mesal--apical lobe curved to an acute point, rarely bidentate (*tibialis*); in some species, as *umbri-color*, with the surface microscopically setuliferous.

Aedeagus. With paired genital ducts, as in the genus; usually moderately slender, in cases conspicuously so, in a few forms very broad; commonly terminating in large oval flaps, in some forms extended into short acute points; a few species with the apical lobes very reduced; in some species, the surface of aedeagus setuliferous.

Key to the Species

(Based on the male sex)

- | | | |
|----|--|----|
| 1. | Wings unpatterned, except for the stigma when present. | 2 |
| | Wings more or less patterned with brown, in cases very heavily so. | 10 |

2. Mesonotal praescutum with three narrow darkened discal stripes, additional to the dusky lateral borders. 3
 Mesonotal praescutum patterned otherwise. 5
3. Wings subhyaline, unpatterned, stigma scarcely differentiated; tip of fore tibia enlarged and blackened; Sc1 ending opposite or before origin of Rs; hypopygium (fig. 27) with gonapophysis bidentate tibialis (Loew)
 Wings suffused with brown, the stigma darker; condition of legs unknown; Sc1 ending beyond origin of Rs; male hypopygium with gonapophysis simple. 4
4. Mesonotal praescutum dark brown, with indications of three still darker stripes; Sc long, Sc1 ending beyond midlength of Rs; hypopygium (fig. 13) with two subequal rostral spines.
 nugatoria Alexander
 Mesonotal praescutum grayish with three conspicuous stripes, the median one very broad; Sc short, Sc1 ending shortly beyond origin of Rs; hypopygium (fig. 26) with a single well-developed rostral spine.
 subpentheres Alexander
5. Mesonotal praescutum gray, with a broad brownish black central stripe; rostrum very short, extending scarcely to beyond the wing root; hypopygium (fig. 4).
 cinereinota (Alexander)
 Mesonotal praescutum virtually uniform in color, without pattern; rostrum longer, more than one-third the length of body. 6
6. Sc short, Sc1 ending immediately beyond origin of Rs. 7
 Sc longer, Sc1 ending opposite midlength of Rs or nearly so. 8
7. Halteres yellow with brown knobs; legs dark brown, the femoral bases paler; distal section of vein M1 plus 2 shorter than the second section; r—m short or obliterated by the fusion of veins R4 plus 5 and M1 plus 2; hy-

popygium (fig. 11) with the dorsal dististyle straight; a single rostral spine; gonapophysis glabrous.

lachrymalis Alexander

Halteres dark brown; legs black, only the extreme femoral bases yellowed; distal section of vein M1 plus 2 longer than the second section; r—m distinct; hypopygium (fig. 29) with the dorsal dististyle curved; two rostral spines; gonapophysis setiferous.

umbricolor Alexander

8. Wings subhyaline, weakly more darkened beyond the cord, stigma dark brown, conspicuous; hypopygium (fig. 18) with the dorsal dististyle narrowly obtuse at apex; rostral spines separated at origin, from small individual tubercles; mesal-apical lobe of gonapophysis very long slender.

pastazina Alexander

Wings tinged with brown, the stigma slightly darker; hypopygium (figs. 20, 32) with the dorsal dististyle acute at tip; rostral spines arising close together; mesal-apical lobe of gonapophysis a flattened blade of normal width.

9

- 9 Hypopygium (fig. 20) with the rostral spines long and slender, exceeding the prolongation, the latter produced beyond the insertion of the spines.

rabula Alexander

Hypopygium (fig. 32) with the rostral prolongation short and obtuse, the spines short.

vindicta dilucida subsp. n.

10. Wings longitudinally bicolored, the broad costal border whitened but interrupted by darkened areas, the remainder of surface infuscated; posterior basitarsi yellow, more or less flattened.

11

Wings not patterned as above; posterior basitarsi not flattened.

12

11. Size small (wing, male, 5.5 mm.); pale costal border extending to wing tip in cell R5; mesonotal praescu-

tum black; hypopygium (fig. 16) with both rostral spines arising from low tubercles.

pallidapex Alexander

Size larger (wing, male, 6.5 mm.); pale costal border not extending to the wing tip, ending as a post stigmal brightening in cell R2; mesonotal praescutum yellow with three confluent black stripes; hypopygium (fig. 12) with the inner rostral spine arising from a long tubercle, the outer one from a much smaller tubercle.

luteimana Alexander

12. Mesonotal praescutum with three darkened discal stripes, additional to any lateral infuscation. 13
 Mesonotal praescutum patterned otherwise. 22
13. Sc long, Sc1 ending nearly opposite midlength of Rs or beyond; darkened areas at origin of Rs and fork Rs, if present, separated. 14
 Sc short, Sc1 ending opposite origin of Rs or just beyond; a common darkened area including the origin of Rs and fork of Rs. 18
14. Size large (wing, male, 10 mm.); wing pattern heavy, with four darker subcostal areas that are much more extensive than the pale interspaces; hypopygium (fig. 17).
parilis Alexander
 Size smaller (wing, male 8 mm. or less); wing pattern restricted or appearing as darkened clouds only, the subcostal areas much smaller than the pale interspaces 15
15. Rostrum relatively short, approximately one-half the wing. 16
 Rostrum longer, approximately two-thirds the wing. 17
16. Wings with small darkenings in base of cell Sc and at end of vein 2nd A; Sc1 ending before midlength of Rs; hypopygium (fig. 24) with the rostral spines shorter than the slender prolongation; gonapophysis pale throughout; aedeagus broad.
separata Alexander.

Wings with base of cell Sc and end of vein 2nd A clear; Sc1 ending beyond midlength of Rs; hypopygium (fig. 25) with the rostral spines longer than the short obtuse prolongation; gonapophysis with mesal-apical lobe a blackened hook; aedeagus very narrow.

stenophallus Alexander

- 17 Mesonotal praescutum and scutum with abundant long erect setae; wings unpatterned except for a dark suffusion in the cubital and anal cells, stigma pale or lacking; hypopygium (fig. 8).

hirsutinota Alexander

Mesonotum without unusually long erect setae; wings with a restricted dark spotted pattern, including the supernumerary crossvein in cell Sc, origin of Rs, fork of Sc, cord, outer end of cell 1st M2, and stigma; hypopygium (fig. 14).

numenius (Alexander)

18. **Size large (wing more than 8mm.); wing pattern very heavy, including the wing apex.** 19
Size smaller (wing less than 8 mm.); wing pattern more restricted, the wing apex not solidly darkened. 20

- 19 Mesonotal praescutum gray with three narrow black stripes; darkened spot at origin of Rs and fork of Sc solid; hypopygium (fig. 15) with the tergal lobes conspicuous; dorsal dististyle slender; rostral spines from a large common tubercle.

opulens Alexander

Mesonotal praescutum reddish or yellowed, with three darkened stripes; darkened spot at origin of Rs and fork of Sc narrowly interrupted in cell Sc, broadly confluent behind; hypopygium (fig. 5) with the tergal lobes low and rounded; dorsal dististyle stouter; rostral spines and low tubercles on face of style at base of prolongation.

dstricta Alexander

20. **Legs brown, including the femora; hypopygium (fig. 21).**

- recondita (Alexander)
- Legs with femora paling to yellow outwardly, enclosing a blackened ring. 21
21. Thoracic pleura uniformly yellow; wing pattern heavy, including conspicuous seams over cord, outer end of cell 1st M2 and as marginal clouds, including both Anal veins; hypopygium (fig. 2).
- beatrix Alexander
- Thoracic pleura grayish plumbeous, paling to yellowish brown beneath; wing pattern paler, the cord, outer end of cell 1st M2 and ends of the veins not clouded; hypopygium (fig. 19).
- plumbeipleura (Alexander)
22. Mesonotum dark plumbeous, without stripes; legs black; Sc long, Sc1 ending opposite three-fourths Rs; dark spots at origin of Rs and fork of Sc widely separated; hypopygium (fig. 1).
- assueta Alexander
- Mesonotum not uniformly dark plumbeous; legs not uniformly blackened (not known for refuga); Sc short, Sc1 usually ending opposite or shortly beyond the origin of Rs, longer in glauca where it extends nearly to midlength of Rs; dark spots at origin of Rs and fork of Sc confluent or but narrowly separated. 23
23. Thoracic dorsum orange or with confluent orange stripes, pleura more yellowed. 24
- Thoracic dorsum patterned with darker, pleura ranging from yellow to brown. 25
24. Mesonotal praescutum with three confluent orange stripes; pattern of legs unknown; dark pattern of wings very reduced, including spots at the supernumerary cross-vein in cell Sc, origin of Rs and stigma; hypopygium (fig. 22).
- refuga Alexander
- Mesonotal praescutum orange-rufous, without apparent darker stripes; femora with tips broadly yellow, encl-

sing a wide dark brown subterminal ring; dark wing pattern more extensive, including the above darkenings as well as seams over the cord, outer end of cell 1st M2, and as marginal clouds; hypopygium (fig. 30).

xanthoplaca (Alexander)

25. Legs uniform in color, the fore femora dull yellow, the other femora more darkened; praescutum grayish brown with a darker median stripe; hypopygium (fig. 23).

scolopax (Alexander)

Legs not uniform in color, the femora paling to yellow outwardly, enclosing a darkened ring; praescutum not patterned as above.

26

26. Mesonotal praescutum yellowish green, with indistinct brown stripes, the usual broad central stripe represented by two darker lines before the suture; hypopygium (fig. 7).

glauca (Alexander)

Mesonotal praescutum yellow or greenish yellow, with broad central darker stripe, in cases with additional paler sublateral darkenings.

27

27. Wing pattern very restricted, with no distinct darkened seam over the cord or outer end of cell 1st M2.

28

Wing pattern heavier, including a more or less distinct darkening over the cord.

29

28. Wings faintly yellowed, more saturated in the costal field, veins chiefly yellow; faint darkened clouds over ends of Anal veins; hypopygium (fig. 9) with rostral spines unequal, both from low tubercles; gonapophysis entirely pale.

inaequispinosa Alexander

Wings faintly infuscated, veins chiefly brown; no darkenings on the Anal veins; hypopygium (fig. 10) with rostral spines nearly equal but from very unequal basal tubercles, the outer one very long, nearly equal in length to the spine; gonapophysis with the mesal-apical lobe hooklike, darkened.

inquisita Alexander

29. Darkened femoral ring only faintly indicated; dark wing pattern paler and more diffuse, especially the marginal clouds which are faintly indicated or lacking; hypopygium (fig. 6) with the two rostral spines from long diverging basal tubercles.

eurygramma (Alexander)

- Darkened femoral ring clearly defined; dark wing pattern more clearly defined, including marginal clouds, especially on vein R3; hypopygium (fig. 3, 28) with the rostral spines not from diverging basal tubercles. 30

30. Hypopygium (fig. 3,) typical form of species) with the ninth sternite very obtuse; rostral spine two, placed at outer end of a flattened sclerotized plate, the prolongation slender; gonapophysis with mesal-apical lobe-darkened, obtuse at tip.

carunculata manabiana subsp. n.

- Hypopygium (fig 28) with the ninth sternite semioval, longer than broad; rostral spines two, slightly unequal, from very long basal tubercles that lie separately side by side, the outermost at the very end of the truncate prolongation; gonapophysis with mesal-apical lobe chiefly pale, curved to the acute tip.

tumidibasis Alexander

In the consideration of the species, including those in Part V to follow, particular emphasis has been placed on the structure of the male hypopygium which is distinctive for each species and should be used in conjunction with the preceding key. Particular emphasis has been placed on the enlarged figure of the rostral prolongation of the ventral dististyle in each species. In almost all cases the drawing has been made from holotype or paratype material. Species included in both Parts IV and V are alphabetically arranged and are numbered consecutively throughout the two papers which should be considered as a unit.

27 **Limonia (Geranomyia) assueta** Alexander, 1943.

Abitagua, Mayorga Plaza, altitude 1100meters, April 12, 1940 (Macintyre); types.

Male hypopygium (fig. 1) with the ninth tergite, 9t, darkened, narrowly transverse, the posterior border with the lobes low, separated by a relatively narrow notch. Ninth sternite, 9s, elongate, narrowed outwardly, with strong setae. Basistyle, b, dark-colored, the simple ventromesal lobe paler. Dorsal dististyle pale, appearing as a flattened, gently curved rod, the apex suddenly narrowed into a straight spine. Ventral dististyle, d, weakly darkened, its total area about one-half greater than the basistyle; rostral prolongation relatively slender, its apex weakly emarginate; rostral spines two, a trifle shorter than the prolongation beyond their insertion, nearly straight, placed close together near the base of the prolongation, one spine a trifle shorter than the other. Gonapophysis, g, with the mesal-apical lobe darkened, relatively stout, narrowed to the acute tip. Aedeagus narrow, the apical lobes small.

28. *Limonia (Geranomyia) beatrix* Alexander, 1945.

Abitagua, altitude 1200 meters, August 15, 1937 (Macintyre);
type.

Male hypopygium (fig. 2) with the ninth tergite, 9t, transverse, the posterior border very shallowly emarginate, the low lobes with unusually strong setae. Basistyle, b, small, its ventromesal lobe oval, constricted at base. Dorsal dististyle a gently curved rod, narrowed to the acute tip. Ventral dististyle, d, large and fleshy, its area exceeding four times the basistyle; rostral prolongation stout, strongly narrowed distad of the spines, the latter from small basal tubercles, one placed just behind the other; spines approximately equal, acute at tips. Gonapophysis, g, with mesal-apical lobe darkened, shell-like in appearance separated from the main body by a deep emargination. Aedeagus, a, terminating in two large divergent flaps.

29. *Limonia (Geranomyia) carunculata* Alexander, 1941.

The types were from Potrerillos, Chiriqui, Panama, altitude 3000 — 3500 feet, taken in May by Brown and MacSwain. The typical form, as shown, does not occur in Ecuador where it is replaced by the race described below.

Male hypopygium (fig. 3) with the ninth tergite transverse, the cephalic or anterior margin convex, the posterior border narrowed,

truncate, without lobes. Ninth sternite, 9s, broadly oval, nearly as extensive as the tergite, the posterior border very obtuse; setae chiefly marginal, the outer pair larger and more powerful, decussate. Basistyle with the ventromesal lobe oval, strongly narrowed at base. Dorsal dististyle a slender weak rod that extends only about two-thirds across the face of the ventral style, at outer end gently curved to the acute tip. Ventral dististyle, d, large and fleshy, its area exceeding three times that of the basistyle; rostral prolongation slender, the two spines arising from the outer end of a conspicuous sclerotized plate; spines strongly recurved, longer than the prolongation itself. Gonapophysis, g, with the mesal-apical lobe long and narrow, only slightly curved, the tip obtuse, main body of apophysis large and pale, broadly rounded. Aedeagus, a, long and pale, terminating in two nearly hyaline oval flaps; surface glabrous.

L. (G.) carunculata manabiana subsp. n.

Much as in the typical form, differing in slight details of the male hypopygium, particularly the emarginate ninth tergite, the posterior border of which is distinctly notched forming obtuse lobes that are provided with strong setae. Dorsal dististyle somewhat stouter.

Holotype, male, Palmar, Manabi, altitude 200 meters, May 20, 1941 (Laddey).

It is probable that this race has a wide range to the south since material that seems to be identical occurs as far as central Bolivia.

30. Limonia (Geranomyia) cinereinota (Alexander, 1913).

Abitagua, Cunibunda, altitude 1100 meters, April 7 — 8, 1940 (Macintyre). Very widely distributed throughout Tropical America—Dominican Republic, Puerto Rico; Venezuela, British Guiana, Paraguay.

Male hypopygium (fig. 4) with the ninth tergite, 9t, transverse, narrowed outwardly, the posterior border with a broad V-shaped emargination, the lobes rather narrowly obtuse, with abundant setae. Ninth sternite broadly oval, setae relatively few, chiefly marginal, the outer ones larger and stouter. Basistyle, b, with relatively few setae on outer face; ventromesal lobe of moderate size, with a small tu-

bercle on its base. Dorsal dististyle a gently curved rather stout rod, narrowed to a long terminal spine. Ventral dististyle, d, relatively small, its area about twice that of the basistyle; rostral prolongation unusually long and slender, the two widely separated spines from small subequal basal tubercles, outer spine longer, about equal to the entire prolongation. Gonapophysis, g, with the mesal-apical lobe flattened, chiefly pale, terminating in a small darkened knob. Aedeagus, a, glabrous, relatively narrow, terminating in two large pale flaps with obtuse tips.

31. ***Limonia (Geranomyia) dstricta*** Alexander, 1940.

Baños, altitude 2000 meters, May 25, 1937 (Macintyre); type. Known also from Venezuela and Peru.

Male hypopygium (fig. 5) with the tergite transverse, its posterior border with a shallow V-shaped emargination, the lobes low, with strong setae, these continued to the base of the tergite along the lateral margin. Ninth sternite, 9s, longer than broad, narrowed outwardly, the tip obtuse; setae chiefly marginal, the outer pair larger. Basistyle, b, with the ventromesal lobe slightly narrowed at base. Dorsal dististyle a gently curved rod, narrowed very gradually into a long terminal spine. Ventral dististyle, d, slightly more than twice as extensive as the basistyle; rostral prolongation slender; spines from small individual tubercles placed at summit of a larger elevation on face of style at base of rostrum; spines straight, subequal in length. Gonapophysis with mesal-apical lobe long and slender, curved gently to the subacute tip.

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

Zumbi, Rio Zamora, altitude 700 meters, November 1, 1941 (Laddey). Widespread from Mexico southward to Ecuador.

Male hypopygium (fig. 6) with the tergite transverse, narrowed outwardly, the posterior border with a relatively deep notch, the lobes conspicuous, with thickened margins and abundant long setae. Ninth sternite semioval, relatively broad; setae sparse, chiefly marginal, the two outer pairs larger and stronger. Basistyle with the ventromesal lobe large. Dorsal dististyle a gently curved rod, narrowed very gradually into the straight terminal spine. Ventral dis-

tistyle, d, large and fleshy, its area exceeding three times the basistyle; rostral prolongation long and slender, the two spines from conspicuous tubercles; outer spine straight, nearly twice as long as its tubercle which is virtually as long as the prolongation beyond it; inner spine strongly bent at base, arising from a smaller tubercle. Gonapophysis, g, pale, the acute apex weakly darkened, the lower concave margin with a conspicuous flange. Aedeagus glabrous, relatively narrow, terminating in two very pale flaps.

33. ***Limonia (Geranomyia) glauca*** (Alexander, 1916).

Huigra, altitude 4500 feet, June 16, 1914 (Parish); type. Abitagua, altitude 1200 meters, August 15, 1937 (Macintyre). Known also from Peru.

Male hypopygium (fig. 7) with the tergite transverse, narrowed outwardly, the posterior border with a broad notch, the lobes obtuse, with long setae. Ninth sternite (not figured) with its outline not clearly visible in the type slide, apparently broadly oval, with strong setae. Basistyle small. Dorsal dististyle a moderately stout rod, narrowed gradually to the acute point. Ventral dististyle, d, large, its area exceeding three times the basistyle; rostral prolongation beyond the spines slender, nearly parallel-sided; spines from small separated but approximated tubercles, spines long, exceeding the prolongation in length. Gonapophysis, g, with the mesal-apical blade relatively broad, pale. Aedeagus, a, broad with the oval terminal flaps very large.

The Peruvian material above mentioned may represent a distinct race. It has the rostral spines shorter, the apical flaps of the aedeagus proportionately smaller.

34. ***Limonia (Geranomyia) hirsutinota*** Alexander, 1943.

Abitagua, altitude 1100 — 1800 meters, March 21 — April 15, 1940 (Macintyre); types.

Male hypopygium (fig. 8) with the tergite transverse, narrowed outwardly, the posterior border with a broad notch, the lobes conspicuous, provided with long setae that are continued cephalad along

the lateral margins of the tergal plate. Ninth sternite longer than broad, the tip obtuse; setae numerous, chiefly grouped in the central half, the broad margins without setae; surface with additional short setulae. Basistyle, b, with the ventromesal lobe unusually long; apex of style blackened. Dorsal dististyle a relatively slender curved rod, near apex suddenly narrowed into a long straight spine. Ventral dististyle, d, large and fleshy, dark-colored, its area about two and one-half times of the basistyle; rostral prolongation short, specially that part beyond the spines which is very obtuse; spines moderately long, straight, arising from the summit of a low common tubercle. Gonapophysis, g, a flat blackened plate, its mesal-apical lobe a very short curved hook. Aedeagus, a, long and narrow, as in *stenophallus*, narrowed to the tip, terminating in two tiny lobules.

35. ***Limonia (Geranomyia) inaequispinosa* Alexander, 1940.**

Baños, altitude 2000 meters, May 25, 1937 (Macintyre); type.

Male hypopygium (fig. 9) with the **ninth tergite, 9 t, transverse**, narrowed outwardly, the posterior border with broad lobes that have a conspicuous outer margin or flange. Ninth sternite broadly obtuse, the setae chiefly lateral in position, the outer pair largest; a pair of small more discal bristles. Basistyle with the ventromesal lobe large. Dorsal dististyle a relatively slender gently curved rod, narrowed to the long terminal spine. Ventral dististyle, d, large and fleshy, its area exceeding three times the basistyle; rostral prolongation beyond the spines relatively slender; spines very unequal, slightly separated, arising from small tubercles; inner spine longer and stouter, the outer spine placed slightly beyond on the upper margin of the prolongation, slender and hairlike. Gonapophysis, g, pale, the mesal-apical lobe long, its margin vaguely crenulate. Aedeagus glabrous, apical lobes relatively large, hyaline, with obtuse margins.

EXPLANATION OF PLATE

Male hypopygia of *Geranomyia*.

Fig. 1. *Limonia (Geranomyia) assueta* Alexander, 1943.

Fig. 2. *Limonia (Geranomyia) beatrix* Alexander, 1945.

- Fig. 3. *Limonia* (*Geranomyia*) *carunculata* Alexander, 1941.
- Fig. 4. *Limonia* (*Geranomyia*) *cinereinota* (Alexander, 1913).
- Fig. 5. *Limonia* (*Geranomyia*) *destricta* Alexander, 1940.
- Fig. 6. *Limonia* (*Geranomyia*) *eurygramma* (Alexander, 1928).
- Fig. 7. *Limonia* (*Geranomyia*) *glauca* (Alexander, 1916).
- Fig. 8. *Limonia* (*Geranomyia*) *hirsutinota* Alexander, 1943.
- Fig. 9. *Limonia* (*Geranomyia*) *inaequispinosa* Alexander, 1940.

(Symbols: a, aedeagus; b, basistyle; d, ventral dististyle; g, gonapophysis; s, sternite; t, tergite).

