

Records and Descriptions of Brazilian Tipulidae (Dipt.). Part XI.

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(With 8 figures)

The species discussed herewith are from the highest mountains in Brazil, Itatiaya in the State of Rio de Janeiro and Caparao in the State of Minas Geraes. Certain of the rich materials that were collected by Mr. L erio Gomes on Alto Caparao have been discussed in the preceding part under this general title (*Rev. de Entomologia*, 15: p. 19, 1944) while a few others are included in the present report. The equally interesting species from Alto Itatiaya are considered in part at this time but there still remains a further small lot for future consideration. Unfortunately the Itatiaya materials collected by Mr. Gomes were not provided with the same accurate data as to altitudes as was done with the Caparao specimens and it is not possible to state with certainty which species are actually characteristic of the highest altitudes. Some of the included species labelled "Alto Itatiaya" are forms that are equally well distributed in the lowlands of southeastern Brazil and the records in such cases would seem to indicate species having an exceptional altitudinal distribution. I am very greatly indebted to Mr. Gomes for his hearty co-operation in making known the rich Tipulid fauna of southeastern Brazil. The types of the new species are preserved in my personal collection of World Tipulidae.

An excellent account of the conditions obtaining on Itatiaya has been provided by Ernest G. Holt¹ and may be consulted by interested persons. He recognizes three life zones: (1) Tropical zone (Foothill Region), alt. 1,400-2,000 feet; (2) Subtropical zone (Forest Region), alt. 2,000-6,000 feet; (3) Temperate zone (Campo Region), alt. over 6,000 feet. The highest altitude of Itatiaya is given as 2,790 meters or nearly 9,200 feet; Alto Caparao (Pico da Bandeira), in Minas Geraes, is slightly higher (2,861 meters) and is the highest point in Brazil. The Gomes collections of Tipulidae from Itatiaya were made in March 1941 whereas the Alto Caparao series was taken in November and December 1941; as a result of this difference in dates, it is not possible at this time to indicate whether the differences in species of Tipulidae from the two areas represent a true condition of distinctness, or whether

¹ Holt, E. G., An ornithological survey of the Serra do Itatiaya, Brazil. *Bull. Amer. Mus. Nat. Hist.*, 57: 251-326, pls. 6-19; 1928.

the differences are due to seasonal distribution. The specimens submitted by Gomes in part bore the label "7,150 feet" and it is presumed that most of the series came from this general altitude. According to the classification of life zones given by Holt, as above, this is in the region of Campo. Holt says: "The ridges, broad slopes, and rocky peaks rising above an altitude of approximately 6,000 feet lie within the Temperate Zone, which is exactly coextensive with the Campo Region. While the principal floral feature is treeless grassland (*campo*), there are many copses of dwarf forest, often quite extensive; and on some slopes wide bands of woods, which are really continuous extensions of the Forest Region, reach up from the Subtropical Zone. In these forests the boundary between the Subtropical and Temperate Zones is very difficult to determine exactly, though at the lowest limits of *campo* it is sharply defined. This is a region of heavy rainfall, considerable fog, and low temperature. Bird-life is not abundant." Elsewhere Holt defines the *campo* as a zone of grasses, sedges, herbs, bushes and dwarf-forest copses, distinguished principally by an abundance of mosses and lichens. The region is very rainy, there being 193 days per annum with some rain; clear days 55. Cold winds blow almost ceaselessly over the heights; beautiful in fair weather.

Although the materials discussed in this and the preceding part under the title are all from high altitudes, it should be noted that in earlier years Mr. J. F. Zikan had collected numerous Tipulidae at and near Campo Bello, near the southern spurs of Itatiaya, usually at altitudes of between 700 and 800 meters, but in a few cases higher up the slopes of the mountain. These Campo Bello records have been listed in preceding parts under this general title (Part I, Rev. de Entomologia, 6: 10-23, 1936; Part II, *Ibid.*, 7: 233-246, 1937; Part III, *Ibid.*, 8: 318-331, 1938). In October 1927, Dr. Hans Zerny collected on the southern slopes of Itatiaya, in the Forest Region, and the few Tipulidae that he secured have been discussed earlier in these reports (*Ibid.*, 13: 166-182, 1942).

Descriptions of new species

Brachypremna itatiayana, sp. n.

General coloration of mesonotum brownish black, the praescutal interspaces narrow; antennae with scape and pedicel testaceous yellow, flagellum black; scutellum dark brown, conspicuously whitened on sides; legs black, the femoral tips and tibial bases and tips narrowly whitened; tarsi white, fore basitarsi

infuscated on proximal half; wings pale brown, variegated with dark brown and more cream-colored areas; stigma dark brown, conspicuous; abdominal tergites brownish black, the anterior lateral angles pale, narrowly separated on the midline of the basal rings of the segments; sternites each with a linear median dash; ovipositor with valves normally elongated, tips of the cerci obtusely rounded.

F e m a l e. — Length, about 14 mm.; wing, 17 mm.

Frontal prolongations of head light yellow above, infuscated beneath; mouthparts dark brown; palpi brownish yellow, terminal segment blackened. Antennae with scape and pedicel testaceous yellow, flagellum black; verticils shorter than the segments. Head above dark brown, the central portion of vertex and the posterior orbits narrowly yellow pollinose; anterior vertex narrow, subequal to the diameter of scape.

Pronotum chiefly brown, with three still darker brown areas, the median one slightly paler in the center. Mesonotal praescutum almost covered by four brownish black stripes, the restricted ground lighter brown, especially in the humeral region where most extensive; mesal edges of intermediate stripes narrowly more blackened, clearly differentiating a narrow gray central vitta; scutum with the very restricted central portion grayish, the lobes extensively brownish black, with slightly paler centers; scutellum conspicuously whitish testaceous on sides, broadly dark brown in center, parascutella brownish black; mediotergite with the restricted ground gray, clearest as two spots near posterior margin, the surface chiefly occupied by three broad brown stripes; pleurotergite with the anapleurotergite chiefly dark brown, its cephalic third, and the katapleurotergite grayish yellow. Pleura pale brown or grayish brown, handsomely patterned, with dark brown, including spots on the sternopleurite, anepisternum, ventral portion of dorsopleural membrane, ventral pteropleurite and cephalic portion of meron; dorsopleural membrane otherwise light brown. Halteres with stem obscure yellow, narrowly clearer yellow at base, knob brownish black. Legs with coxae yellow, the outer faces extensively infuscated, particularly the fore pair; trochanters yellow; femora brownish black, very restrictedly paler at base, the tip narrowly but abruptly white; tibiae black, the base and tip narrowly whitened, the amount less than the femoral tip and approximately equal on all legs, on the posterior tibiae the white tips slightly more extensive; tarsi yellowish white, on fore legs the proximal half of basitarsus infuscated (middle legs broken).

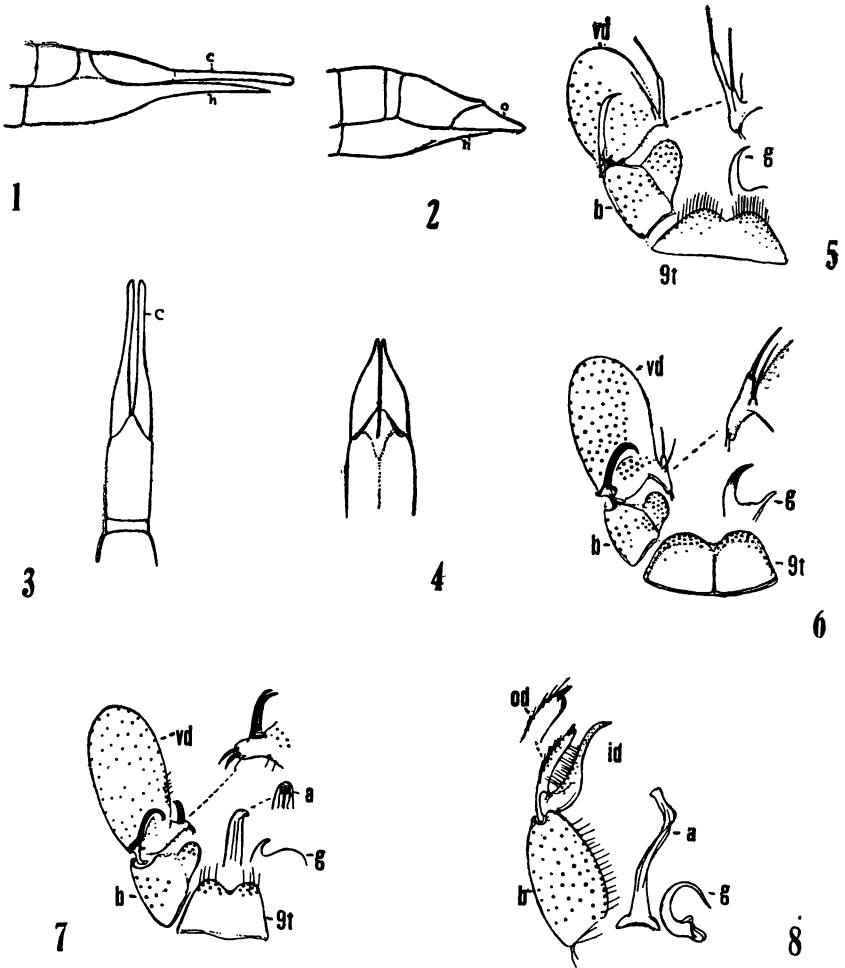


Fig. 1. *Brachypremna itatiayana*, sp. n., ovipositor, lateral aspect. — Fig. 2. *Brachypremna breviterebra*, sp. n., ovipositor, lateral aspect. — Fig. 3. *Brachypremna itatiayana*, sp. n., ovipositor, dorsal aspect. — Fig. 4. *Brachypremna breviterebra*, sp. n., ovipositor, dorsal aspect. — Fig. 5. *Limonia (Geranomyia) avara*, sp. n., male hypopygium. — Fig. 6. *Limonia (Geranomyia) relata*, sp. n., male hypopygium. — Fig. 7. *Limonia (Dicranomyia) itatiayana*, sp. n., male hypopygium. — Fig. 8. *Shannonomyia gracilior*, sp. n., male hypopygium. — (Explanation of symbols: a, aedeagus; b, basistyle; c, cercus; g, gonapophyses; h, hypovalva; id, inner dististyle; od, outer dististyle; t, tergite; vd, ventral dististyle).

Wings with the ground pale brown, variegated with dark brown and more cream-colored areas; stigma dark brown, conspicuous, the center vaguely paler; cells C and Sc uniformly brownish yellow; a broad brown seam along vein Cu, involving the posterior border of cell M; outer ends of veins R₄₋₅ and M₁ conspicuously infuscated, the other medial veins and distal portion of vein M less conspicuously seamed; cell 2nd A almost uniformly darkened; centers of outer ends of cells R₃ to M₁, inclusive, extensively

cream-colored; very restricted whitened areas at either end of stigma; veins brown. Venation: Much as in *candida*; *Rs* slightly longer; cell M_1 deep, the veins deflected strongly caudad; petiole of cell M_1 about one-third to one-fourth m ; cell 1st M_2 broad, the greatest width about two-thirds the length; $m-cu$ about one-third its length beyond the fork of M .

Abdominal tergites brownish black, the anterior lateral angles pale, narrowly separated at middle of the basal ring; on the more proximal segments, the lateral margin of sclerite further pale, on the fourth and following segments uniformly darkened; sternites yellow, with linear median brown dashes, interrupted on the basal rings, the areas slightly more widened over the posterior borders of the intermediate sternites. Ovipositor (Fig. 1, lateral aspect; Fig. 3, dorsal aspect) with the genital shield brownish fulvous; valves, especially the cerci of the normal elongate form of the genus, straight; tips of cerci obtusely rounded.

Hab. Brazil (Rio de Janeiro).

Holotype, female, Alto Itatiaya, March 1941 (Gomes).

By my key to the Neotropical species of *Brachypremna* (Journ. N. Y. Ent. Soc., 20: 228; 1912), the present fly runs to *B. candida* Alexander, which is the most similar described species. It differs in the pattern of the thorax, legs and wings, particularly the coloration of the tibiae and tarsi, and in the venational details.

Brachypremna breviterebra, sp. n.

Size medium (wing, female, about 18 mm.); mesonotal praescutum with four dark brown stripes that greatly restrict the ground; frontal prolongation of head yellow, the lower half of sides dark brown; femora black, the tips white; tibiae black, the bases whitened, the tips broadly so, narrow on the fore legs, very broad on the posterior pair; tarsi white; wings brownish yellow, patterned with darker brown and cream-colored areas; abdominal tergites dark brown, the basal rings of tergites three to seven with complete yellow bands; sternites yellow with linear median darkenings; ovipositor with the valvies, especially the cerci, unusually short, long-triangular in outline, the width across base about one-half the total length.

F e m a l e. — Length, about 15 mm.; wing, 18.5 mm.

Frontal prolongation of head yellow above and on ventral surface, the lower half of sides dark brown; nasus elongate; palpi with the basal segments chiefly yellow, terminal segment black,

its base and tip narrowly pale. Antennae with scape and pedicel pale; first flagellar segment chiefly pale, the remainder of organ black. Head above chiefly darkened, pale beneath.

Pronotum chiefly darkened. Mesonotal praescutum with the fulvous-orange ground color very restricted, the surface of sclerite virtually covered by four dark brown stripes, the intermediate pair narrowed and confluent behind; lateral stripes broad; humeral and lateral portions of praescutum somewhat lighter brown; scutum with lobes extensively dark brown, their lateral posterior portions paler, median region yellow pollinose; scutellum darkened medially and at base, the lateral portions broadly yellow; parascutella dark; mediotergite with the ground color gray pruinose, with three brown stripes, the median one somewhat paler brown, narrowed behind, lateral stripes distinct; pleurotergite chiefly pale, restrictedly variegated with brown. Pleura yellow, conspicuously spotted with dark brown. Halteres with stem yellow, knob dark brown. Legs with coxae pale, patterned with brown on outer faces; trochanters yellow; femora black, obscure yellow basally, the tips broadly whitened, the amount subequal on all legs; tibiae black, the bases similarly whitened, the amount subequal to the femoral tips; tips of tibiae whitened, narrowest (about distal fifth) on fore legs, broadest (about distal four-fifths) on hind legs, the dark ring of the latter being about three times as extensive as the whitened bases; middle tibiae with about the distal three-fifths pale; all tarsi white. Wings brownish yellow, patterned with darker brown and cream-colored areas, cells *C* and *Sc* uniformly brownish yellow, more strongly infuscated basally; stigma dark brown, the posterior half paler; conspicuous brown seams along vein *Cu*, especially in cell *M*; *m-cu* and outer ends of veins R_{4-5} and M_1 seamed; outer central portions of cells R_3 , R_5 and M_1 cream-yellow; veins brown, more brownish yellow in the costal field. Venation: *Rs* relatively long, nearly square at origin; vein M_1 strongly arcuated at origin, widening the cell; *m* only a little shorter than the basal section of M_{1-2} and about twice the petiole of cell M_1 ; *m-cu* just beyond the fork of *M*.

Abdominal tergites dark brown, the lateral portions of the more proximal segments yellow; basal rings of tergites three to seven, inclusive, clear yellow, forming narrow but complete crossbands; sternites yellow with linear brownish black median dashes, the basal rings clear; second sternite with three such dashes, these more expanded and including a basal spot. Ovipositor (Fig. 2, lateral aspect; Fig. 4, dorsal aspect) with the genital

shield light yellow, opaque; cerci, *c*, very short, long-triangular in outline, the tips narrowly obtuse to subacute; width of cerci across bases about one-half the total length; hypovalvae, *h*, extending virtually to the tips of the cerci.

Hab. Brazil (Rio de Janeiro).

Holotype, female, Alto Itatiaya, March 1941 (Gomes).

Brachypremna breviterebra is entirely different from the other regional species in the shape of the ovipositor, particularly of the cerci. From other regional species having a somewhat similar leg-pattern, including *B. integristigma* Alexander, *B. pictipes* Osten Sacken, and *B. variitibia* Alexander, it differs conspicuously in the pattern of the body, particularly of the abdomen. All three species mentioned have the ovipositor of the normal elongate form.

Macromastix (Macromastix) caparaona, sp. n.

Allied to *luteistigma*; general coloration gray, the praescutum with four darker gray stripes, the lateral pair margined with brown; antennae, short, 11-segmented; knobs of halteres blackened; femora yellow, the tips blackened, much broader on the fore legs; wings suffused with brown, the bases of Anal cells and the center of disk more whitened; cell M_1 present; abdomen gray, the tergites with sublateral brown stripes; male hypopygium with both basistyles and dististyles very elongate; inner dististyle with a stout lobe on outer margin near base.

Male. — Length, about 12-14 mm.; wing, 12-15 mm.; antenna, about 1.6-1.8 mm.

Frontal prolongation of head elongate, about one-half longer than the remainder of head, joining the remainder of front at a slight angle to produce a shallow notch; no nasus; prolongation black with a conspicuous orange stripe on either side, in cases with the entire dorsal half orange; palpi black. Antennae 11-segmented, short; scape short, light gray; pedicel dark brown at base, more reddened at apex; flagellum black, the segments cylindrical, with very short verticils. Head light gray, the antennal fossae bordered by yellow.

Pronotum gray. Mesonotum gray, the praescutum more yellowish gray on the posterior interspaces, with four darker gray stripes; intermediate pair dark gray, separated by a narrow, paler gray, median vitta; lateral stripes conspicuously margined with brown; vestiture of praescutum yellow, sparse but long and conspicuous; posterior sclerite of notum clear light gray, the scutal lobes extensively brown, bordered along their cephalic and mesal

margins by darker brown. Pleura clear light gray, dorsopleural membrane more buffy. Halteres brown, base of stem more yellowed, knob blackened. Legs with coxae clear light gray; trochanters brownish yellow, sparsely pruinose; femora yellow, the tips blackened, broadest on fore pair where nearly the outer half is involved, more restricted on middle femora, very narrow on posterior legs where about the outer tenth is blackened; tibiae brown, the tips blackened; tarsi black, the proximal ends of basitarsi a little paler; claws simple; in *luteistigma* and *chrysostigma*, claws longer and strongly toothed. Wings suffused with brown, the central portion conspicuously whitened; prearcular field orange; stigma chiefly dark, a little paler than the surrounding costal darkening; the pale central stripe involves most of cells M and $1st M_2$, with the restricted adjacent portion of outer end of R , together with an isolated area including most of cell $2nd A$ and the basal third of $1st A$; veins dark brown, yellow in the prearcular field. Venation: R_s elongate, from one and one-half to nearly twice R_{2-3} and more than twice $m-cu$; R_{1-2} preserved but pale; cell M_1 subequal in length to its petiole, in cases a little longer or shorter; cell $1st M_2$ elongate, m shorter than the first section of M_{1-2} ; M_{3-4} about twice the first section of M_{1-2} ; cell $2nd A$ moderately wide.

Abdominal tergites gray, the extreme lateral borders yellow; on either side and extending from base of abdomen to extreme base of tergite eight with a conspicuous dark brown stripe that is very narrowly interrupted at the posterior border of the segments where the color is of the gray ground; sternites brownish gray to gray; ninth tergite and proximal ends of basistyles gray, the outer ends of the latter, with the dististyles, obscure orange to reddish brown. Male hypopygium with the tergite transverse, its caudal margin truncate or virtually so. Basistyles unusually long and slender, with the dististyles at tips. Both dististyles united basally, the outer an expanded flattened blade, its outer margin before apex weakly emarginate; inner style narrow, particularly the very long, slender distal portion which is strongly curved to the narrowly obtuse apex; outer margin near point of separation of the outer style with a conspicuous lobe that is provided with strong setae on its proximal margin, at apex with four or five small spinous setae, the outer face glabrous or virtually so. In *luteistigma*, this lobe is much more slender, with abundant spinous points on the face of style beyond the base of lobe.

Hab. Brazil (Minas Geraes).

Holotype, male, Alto Caparaó, altitude 2,700 meters, November 1941 (Gomes). Paratopotypes, 4 males, altitude 2,500-2,600 meters, November 1941 (Gomes).

The closest described relative of the present fly is *Macromastix (Macromastix) luteistigma* Alexander, likewise from southeastern Brazil but at low altitudes. This differs in the yellow stigma and in other details of coloration and venation, but especially in the structure of the male hypopygium, as discussed above.

Macromastix (Macromastix) chryso stigma, sp. n.

Allied to *luteistigma*; general coloration of thorax golden yellow pollinose, the praescutum with four conspicuous brown stripes; knobs of halteres brownish black; femora obscure brownish yellow, their tips narrowly blackened; claws (male) toothed; wings narrow, strongly infuscated, particularly the cells of the costal border; stigma intensely light yellow; *Rs* short, cell *2nd A* very narrow; abdominal tergites dark brown, the intermediate segments with a yellow lateral spot on outer portion of segment, the outer part more intensely blackened; male hypopygium with the lobe of the inner dististyle terminating in a single powerful blackened spine.

Male. — Length, about 14 mm.; wing, 12.5×2.3 mm.; antenna, about 1.2 mm.

Frontal prolongation of head relatively long, about one-third longer than the remainder of head, deep fulvous orange above, more infuscated on ventral half; no nasus; palpi black. Antennae (male) short, 11-segmented; scape and pedicel light yellow, flagellum black; basal flagellar segments long-suboval, the lower face slightly more bulging; verticils short and reduced; outer segments becoming more elongate, particularly the outer two; verticils of outer segments longer and more conspicuous but shorter than the segments. Head above yellowish gray, light yellow on front and vertical tubercle, slightly clearer gray on central portion of posterior vertex, this area moderately wide, delimited by a row of short black setae, and, on occiput, by a pair of brown lines; sides of posterior vertex more infuscated; genae light golden-yellow; posterior orbits narrowly infuscated; anterior vertex broad, approximately five times the diameter of scape.

Pronotum brown, yellow pollinose, with four small brown spots. Mesonotal praescutum with the ground golden-yellow pollinose, with four conspicuous brown stripes, the intermediate

pair more intensely darkened at their cephalic margin, strongly narrowed behind, the median ground vitta becoming correspondingly widened; lateral stripes conspicuous, at their cephalic end continued laterad as a narrower line to the margin; still laterad of this the ground color becomes slightly more grayish; scutum yellow pollinose, each lobe with two conspicuous dark brown areas, the posterior one larger, paling to yellow on its posterior portion; scutellum and postnotum reddish brown, with a heavy golden-yellow pollen. Pleura somewhat more grayish pruinose on ventral sternopleurite, meron and katapleurite, the remainder light yellow; dorsopleural membrane deep fulvous. Halteres with stem brown, narrowly fulvous at base, knob brownish black. Legs with coxae yellow, more pruinose at base behind; trochanters yellow; femora obscure brownish yellow, the tips narrowly blackened; tibiae brown, the tips blackened; tarsi black; claws (male) toothed. Wings narrow, more than five times as long as broad; ground color strongly infuscated, cells *C* and *Sc* more heavily so; prearcular field extensively fulvous yellow; stigma conspicuously light yellow; indications of slight darkenings at both ends of stigma and over the anterior cord; veins brown, fulvous in the prearcular field. Compared with *luteistigma* the present fly has the stigma smaller and even more conspicuously yellow. Veins glabrous. Venation: *Rs* short, subequal to or shorter than R_{2-3} ; R_{1-2} more elongate than in *luteistigma*; cell M_1 subequal to its petiole; cell *2nd A* very narrow, less than cell Cu_2 opposite this point. In *luteistigma*, *Rs* is longer while cell *2nd A* is wide, fully twice the width of cell Cu_2 opposite its greatest width.

Abdominal tergites dark brown, the intermediate segments with a conspicuous yellow mark on lateral border, occupying more than the outer half of segment, the basal portion more intensely blackened than the remainder of ground; central portions of tergites somewhat brighter than the sublateral portions but not forming distinct sublateral stripes; sternites paler brown, the segments somewhat more brightened basally; hypopygium infuscated. Male hypopygium of the general type found in *luteistigma* but differing in all details. Basistyle of moderate length. Outer dististyle generally oval in outline, broadest across midlength, thence tapering strongly to the narrowly obtuse apex; outer margin of dilated portion with unusually long setae. Inner dististyle with the lobe on outer margin near base relatively slender, terminating in a single powerful blackened spine, with a few other smaller ones on

the face; surface of style immediately distad of lobe with about fifteen still smaller spines, distad of which the style bears numerous long black setae.

Hab. Brazil (Minas Geraes).

Holotype, male, Alto Caparaó, altitude 2,000 meters, November 1941 (Gomes).

Most nearly related to *Macromastix* (*Macromastix*) *luteistigma* Alexander (southeastern Brazil, at lower altitudes), differing especially in the coloration of the body and wings and in the venation and hypopygial details, as indicated above.

Tipula (*Eumicrotipula*) *itatiayensis*, sp. n.

Mesonotal praescutum yellow, heavily patterned with dark brown, the median stripe trifold in front; antennae very short, the outer flagellar segments weakly bicolored; tips of femora blackened; wings light brown, variegated with darker brown and yellow areas, the former including a series of four subcostal markings; yellow pattern of basal cells restricted but conspicuous, in cell 1st A zigzag in arrangement; *Rs* long; male hypopygium with the ninth tergite terminating in three spinous points; lobe of basistyle triangular in outline, bearing a conspicuous hair-pencil on ventral surface; appendage of eighth sternite long and conspicuous, appearing as a depressed-flattened lobe that is about three times as long as its greatest width.

Male. — Length, about 14-16 mm.; wing, 16-19 mm.; antenna, about 2.2-2.6 mm.

Female. — Length, about 29-30 mm.; wing, 20-21 mm.; abdomen alone, 22-23 mm. One female much smaller, length, 20 mm.; wing, 15 mm.

Frontal prolongation of head yellowish brown; nasus present; palpi black, the incisures of the proximal two segments brightened. Antennae short in both sexes, subequal in length to the palpi; basal segments yellow, the outer very weakly bicolored, their bases weakly infuscated, the tapering outer portions more yellowed; verticils conspicuous, longer than the segments. Head brownish yellow, clearer yellow on disk of vertex; a conspicuous brown median stripe; vertical tubercle notched medially, lined with brown on sides.

Pronotum chiefly dark brown. Mesonotal praescutum with the restricted ground yellow pollinose, the surface heavily patterned with dark brown; median stripe trifold on anterior half, being split

by two narrow reddish lines to appear three-parted, all these stripes confluent on posterior half; lateral stripes small, entire; lateral borders of praescutum broadly infuscated; posterior interspaces near suture weakly darkened; scutal lobes with the ground color clear gray, heavily patterned with dark brown, the median area paler brown, continued caudad over the scutellum and mediotergite as a common central darkening; remainder of posterior sclerites of notum yellowish gray, the pleurotergite extensively infuscated, especially on posterior half of katepaleurotergite, the anterior half golden yellow pollinose. Pleura yellowish gray, patterned with brown spots on propleura, mesepisternum and dorsal pteropleurite; dorsopleural membrane dark fulvous. Halteres with stem obscure yellow, knob infuscated. Legs with coxae brownish yellow, in cases more or less spotted with darker on outer face; trochanters yellow; femora obscure yellow, tips blackened, the amount subequal on all legs; tibiae brown, paler basally; tarsi passing into black; claws simple. Wings with the ground light brown, variegated by darker brown, cream-colored and darker yellow areas; cell *C* uniformly light brown; cell *Sc* saturated yellow, with four dark brown spots that are only about one-half as extensive as the interspaces; stigma scarcely darker than the ground; a conspicuous whitened oblitative area across cell *1st M*₂; creamy areas relatively restricted but well scattered over the wing surface, including the outer medial field and all basal cells, being particularly evident in cells *M*, *Cu* and the Anals; outer medial cells with dusky centers; cell *M* with an especially distinct spot before its outer end; cell *Cu* with paired pale spots on proximal half; cell *1st A* with its outer portion characteristically patterned with zigzag or recurved pale areas; prearcular field infuscated; veins brown, more brownish yellow in the costal region and interspaces. Venation: *R*₁₋₂ entire; *Rs* long, nearly straight, more than twice *m-cu*; petiole of cell *M*₁ subequal to *m*.

Abdominal tergites with the ground yellow, deeper and more obscured on outer segments; a median black stripe that is narrow on basal segments, much wider on outer portion of abdomen; basal sublateral portions of tergites weakly darkened; sternites yellow, the outer segments more darkened; hypopygium yellow. Ovipositor with the genital shield polished obscure yellow, darker laterally; cerci long and slender, straight. Male hypopygium with the caudal border of tergite terminating in three flattened blades that terminate in acute points, separated from one another by broad U-shaped

notches, the median point glabrous, lying slightly lower than the level of the broader lateral lobes, the outer portions of which extend into spines. Basistyle with lobe long-triangular in outline, extended distad into an obtuse spine; ventral portion of lobe bearing a pencil of about a dozen setae of different lengths, the longest subequal in length to the entire lobe. Outer dististyle long and narrow, the blade moderately expanded. Inner dististyle narrow at base, the outer half more expanded, the elevated dorsal crest with a single row of unusually long bristles, the tips of which are hair-like and angularly bent; beak of style obtuse. Gonapophyses stout, sinuous, at apex split into two blades, one subcultrate, acute at tip, the other blade more truncated at apex, with both outer angles, but particularly the inner one, produced into strong straight spines; base of apophysis with a smaller flattened blade, its tip obtusely rounded. Eighth sternite with the median appendage conspicuous, depressed-flattened, broadest near base, thence narrowed outwardly to the narrowly obtuse or subacute tip; greatest width of lobe about one-third the length; surface with numerous long setae.

Hab. Brazil (Rio de Janeiro).

Holotype, male, Alto Itatiaya, March 1941 (Gomes). Allotopotype, female. Paratopotypes, 8 of both sexes.

The present fly is quite distinct from all other regional species, including *Tipula (Eumicrotipula) paranensis* Alexander and *T. (E.) profuga* Alexander, differing particularly in the structure of the male hypopygium, including the tergite, inner dististyle, gonapophysis and eighth sternite. The present fly will probably be found to be a characteristic high-altitude species in the Southern Brazilian highlands.

Limonia (Geranomyia) avara, sp. n.

General coloration of thorax gray; rostrum elongate, approximately one-half the remainder of body; praescutum with a relatively broad black central stripe and shorter brownish black sublateral ones; knob of halteres infuscated; femora obscure yellow with a dark brown subterminal ring; wings creamy, with a heavy brown costal pattern and extensive brownish gray washes over the disk and posterior margin; dark area over origin of *Rs* and fork of *Sc* a common one; male hypopygium with the rostral spines long and straight, arising from very unequal tubercles, the longest tubercle subequal in length to its spine and approximately five times as large as the smaller one; gonapophysis with mesal-apical lobe long and slender, pale, with smooth margins.

Male. — Length, excluding rostrum, about 6 mm.; wing, 7.7 mm.; rostrum, about 3.2 mm.

Rostrum long, approximately one-half the remainder of body, black, the tips of the labial palpi a trifle paler; maxillary palpi black. Antennae black throughout; flagellar segments cylindrical or subcylindrical; verticils short; terminal segment about one-third longer than the penultimate. Anterior vertex reduced to a narrow strip, light gray, the color continued backward over the posterior vertex, the latter darker on either side, deepening to triangular blackened spots on the anterior portion of posterior vertex behind the eyes.

Pronotum dark brown, a little paler above. Mesonotal praescutum with the ground obscure yellow, gray pruinose, clearer yellow in the humeral region; a relatively broad black central stripe, with shorter brownish black, sublateral stripes, separated from the median line by narrow pruinose interspaces; lateral praescutal border broadly dark brown; median portion of scutum pale, the lobes extensively dark brown or brownish black, their centers gray; scutellum testaceous yellow, clearer yellow posteriorly, parascutella pale; mediotergite blackened, more pruinose on its anterior portion. Pleura and pleurotergite more plumbeous gray; dorsopleural membrane buffy. Halteres with stem yellow, knob infuscated. Legs with coxae and trochanters pale yellow or greenish yellow; femora obscure yellow, with a dark brown subterminal ring before the slightly narrower, clearer yellow tip; tibiae and proximal two tarsal segments brownish yellow, narrowly darkened at and near tips; outer tarsal segments more uniformly dark brown. Wings with the ground color creamy, heavily patterned with brown costal areas and more brownish gray discal and marginal washes; interspaces of cell *Sc* clear yellow; the costal areas lie at and beyond *h*; over supernumerary crossvein in cell *Sc*; a common area involving the origin of *Rs* and fork of *Sc*; stigma, this last larger but disconnected from the broad brown seam over the cord; paler washes over cord, *M*, most of the veins beyond cord and very extensively over the tips of both Anal veins; veins pale in the interspaces, becoming flavous in the costal field, dark brown in the heavily patterned areas. Venation: *Sc*₁ ending about opposite one-fourth to one-fifth the length of *Rs*, *Sc*₂ a short distance from its tip; cell 1st *M*₂ about as long as vein *M*₁₋₂ beyond it; *m-cu* just beyond fork of *M*.

Abdominal tergites chiefly dark brown, the proximal ones more brightened on their central basal portions; basal sternites

yellow, the outer segments and hypopygium chiefly infuscated. Male hypopygium (Fig. 5) with the tergite, *9t*, moderately emarginate, the lobes obtuse, provided with abundant elongate dark setae. Basistyle, *b*, relatively small, its total area only about one-third that of the ventral dististyle. Dorsal dististyle only gently curved, its tip acute. Ventral dististyle, *vd*, with its prolongation very small, the outer face chiefly occupied by the tubercles that bear the rostral spines; tubercles very unequal in size, one scarcely a fourth or fifth the size of the other but both bearing spines of approximately equal size and shape, the spine subequal in length to the longest tubercle. Gonapophyses, *g*, with mesal-apical lobe long and slender, pale, gently curved to the acute tip, the margins smooth.

Hab. Brazil (Rio de Janeiro).

Holotype, male, Alto Itatiaya, March 1941 (Gomes).

In its general appearance, the present fly somewhat resembles *Limonia* (*Geranomyia*) *plumbeicolor* Alexander but is entirely distinct in the structure of the male hypopygium. This latter is somewhat as in *L. (G.) inquisita* Alexander, of the Peruvian Andes, but with all the details distinct.

Limonia (*Geranomyia*) *relata*, sp. n.

Size relatively large (wing, male, 8 mm. or more); general coloration gray, the praescutum with three narrow blackened discal stripes, additional to the darkened lateral borders; knobs of halteres blackened; femora blackened, with vague indications of yellow tips and a subterminal yellow ring; tibiae and tarsi black; wings yellowish, heavily patterned with brown costal areas and paler brown discal washes; a common costal area over origin of *Rs* and fork of *Sc*; male hypopygium with the two rostral spines subequal in length but arising from very unequal tubercles; gonapophyses with mesal-apical lobe a slender curved blackened spine.

Male. — Length, excluding rostrum, about 7-7.3 mm.; wing, 8-8.5 mm.; rostrum, about 2.8-3 mm.

Female. — Length, excluding rostrum, about 7 mm.; wing, 9 mm.; rostrum, about 3 mm.

Rostrum elongate, black, the tips of the labial palpi a trifle paler. Antennae black throughout; flagellar segments subcylindrical to nearly oval; terminal segment about one-third longer than the penultimate; verticils short and inconspicuous. Anterior vertex narrow, a trifle wider than the diameter of scape; front gray;

anterior vertex and a median line over the posterior vertex buffy, the sides of the latter more blackened, paling to gray on the posterior orbits and genae.

Pronotum gray, with three narrow blackened lines. Mesonotum gray, the praescutum with three narrow black discal stripes and an additional black spot or stripe near the lateral border behind the ochreous humeral region, this last area most conspicuous when viewed from above; the three discal stripes are a little wider than the interspaces, especially the anterior end of the median vitta; scutum testaceous gray medially, the lobes clearer gray, ringed with blackish; scutellum brownish gray with a vague paler central line, parascutella chiefly obscure yellow; postnotum black, sparsely pruinose, the posterior angle of the pleurotergite more fulvous brown. Pleura blackened, pruinose, to appear more or less plumbeous; dorsopleural region more infuscated; meral region paling to yellow. Halteres with stem yellow, knob blackened. Legs with fore coxae blackened, mid-coxae infuscated, posterior coxae yellow, all more or less pruinose; trochanters yellow; femora narrowly yellow basally, blackened outwardly, with vague indications of a very narrow yellow tip and an even fainter subterminal yellow ring, the general appearance of the femora blackened; tibiae and tarsi black; claws long, with a single elongate spine placed close to base. Wings with the restricted ground color yellow, heavily patterned with dark brown areas and more extensive paler brown washes; the four larger costal areas include a common one over the origin of *Rs* and fork of *Sc*, this being the largest of these costal spots; cord and outer end of cell *1st M*₂ extensively seamed with brown; elsewhere on disk the paler washes include the wing-tip, broad marginal clouds, particularly over the ends of the Anal veins, and extensive washes in cells *R*, *M* and *Cu*; veins brown, yellow in the more brightened costal interspaces. Venation: *Sc*₁ ending about opposite one-third to one-fifth the length of *Rs*, *Sc*₂ some distance from its tip but also beyond the origin of *Rs*; cell *1st M*₂ subequal to or a trifle exceeding the distal section of *M*₁₋₂; *m-cu* close to fork of *M*; cell *2nd A* wide.

Abdominal tergites, including hypopygium, black, more or less pruinose, the lateral tergal borders narrowly paler; sternites more obscure yellow. Male hypopygium (Fig. 6) with the tergite, *9t*, transverse, its posterior margin with a deep V-shaped notch, the lateral lobes obtusely rounded, with unusually broad thickened margins, provided with abundant long black setae. Basistyle, *b*, small, its total area scarcely one-fourth that of the ventral dististyle;

ventromesal lobe simple. Dorsal dististyle a slightly curved or bent rod, the tip acute. Ventral dististyle, *vd*, with the rostral prolongation relatively slender, provided with two spines arising from unequal tubercles, the larger tubercle sloping directly to the tip of the prolongation, bearing a spine that is approximately twice its own length; second spine from a much smaller tubercle placed on the side of prolongation near the base of the major one, its spine about equal to or a trifle longer than the former. Gonapophyses, *g*, with the mesal-apical lobe a slender curved blackened spine.

Hab. Brazil (Rio de Janeiro).

Holotype, male, Alto Itatiaya, March 1941 (Gomes). Allotopotype, female. Paratopotypes, 5 males and females.

Although somewhat resembling *Limonia* (*Geranomyia*) *avara*, sp. n. and *L. (G.) plumbeicolor* Alexander, the present fly is quite distinct in the coloration and in the details of structure of the male hypopygium.

Limonia (*Dicranomyia*) *itatiayana*, sp. n.

Size relatively large (wing, male, over 8 mm.); general coloration of mesonotum yellow and black, the disk of the praescutum blackened; rostrum, palpi and antennae black; thoracic pleura variegated with dark brown; legs black; wings with a strong dusky tinge, stigma oval, darker brown, the cord vaguely seamed with brown; abdominal tergites and hypopygium brownish black, sternites abruptly yellow; male hypopygium with the rostral prolongation of the ventral dististyle small, terminating in two flattened setae; rostral spines long and powerful, placed very close together, arising from a short common base; gonapophyses with mesal-apical lobe relatively slender, gently curved.

Male. — Length, about 7.5-8.5 mm.; wing, 8.5-10 mm.

Female. — Length, about 8 mm.; wing, 8 mm.

Rostrum and palpi black. Antennae with scape brownish black; pedicel and flagellum black; basal flagellar segments suboval, the outer ones more elongate, the terminal segment about one-third longer than the penultimate; verticils of outer segments shorter than the segments. Head blackened, sparsely gray pruinose, more heavily so on anterior vertex, the latter about twice as wide as the diameter of the scape.

Pronotum black, sparsely pruinose, paling to yellow on the sides. Mesonotal praescutum with the disk chiefly occupied by three confluent black stripes, the broad humeral and lateral portions

deep yellow; scutum with the median area testaceous yellow, the lobes extensively blackened; scutellum chiefly blackened, the caudal margin yellow, parascutella yellow; mediotergite dark brown, the anterior lateral angles yellow; pleurotergite chiefly yellow, blackened ventrally. Pleura yellow, extensively patterned with dark brown on propleura, anepisternum and ventral sternopleurite, with a small, still darker spot on the dorsal anepisternum beneath the wing root; posterior sclerites of pleura and the dorsopleural membrane clearer yellow. Halteres brownish black, the base of stem yellow. Legs with the fore coxae blackened, the remaining coxae and all trochanters yellow; legs black, the femoral bases very restrictedly brightened; claws relatively small, conspicuously toothed near base. Wings with a strong dusky tinge; stigma oval, darker brown; cell *Sc* infuscated; cord diffusely and somewhat vaguely seamed with brown; veins brown, the bullate areas along cord extensive. Venation: *Sc*₁ ending opposite origin of *Rs*, *Sc*₂ some distance from its tip, *Sc*₁ alone exceeding one-half *Rs*; cell *1st M*₂ rectangular, about equal in length to vein *M*₃ beyond it; *m-cu* subequal to the distal section of *Cu*₁, placed a short distance before the fork of *M*, the distance variable.

Abdominal tergites and hypopygium brownish black; sternites abruptly yellow, clear yellow on the basal sternites; ninth tergite extensively paler. Male hypopygium (Fig. 7) with the ninth tergite, *9t*, relatively long, the sides nearly straight; caudal margin with a broad U-shaped notch, the lobes with relatively few but long setae. Basistyle, *b*, about one-fourth the area of the ventral dististyle; ventromesal lobe simple. Dorsal dististyle relatively small, strongly curved, the tip obtuse or slightly decurved. Ventral dististyle, *vd*, entirely blackened, the mesal face distad of the rostrum with a concentration of strong setae, these more scattered elsewhere on the style; rostral prolongation small, terminating in two flattened setae; rostral spines long and powerful, from a short common base, gently curved, lying very close together. Gonapophyses, *g*, with mesal-apical lobe relatively slender, gently curved, the tip subacute to narrowly obtuse, the margins smooth.

Hab. Southeastern Brazil.

Holotype, male, Alto Itatiaya, Rio de Janeiro, March 1941 (Gomes). Allotype, female, Alto Caparaó, Minas Geraes, altitude 2,400 meters, December 1941 (Gomes). Paratopotypes, several males; paratypes, several of both sexes, with the allotype, altitude 2,200-2,650 meters; several of both sexes, Terezópolis, Organ

Mts., Rio de Janeiro, altitude 1,000 meters, September 1942 (Gomes).

Allied to various other American species of the subgenus that center about the Nearctic *Limonia* (*Dicranomyia*) *humidicola* (Osten Sacken), differing from other regional allies, as *L. (D.) alboapicalis* Alexander, particularly in the coloration of the body, legs and wings, and in the structure of the male hypopygium, especially the rostral prolongation and the gonapophyses. It is probable that this fly will be found to be one of the most common and characteristic species of Tipulidae in the southern Brazilian Highlands.

Shannonomyia erubescens, sp. n.

General coloration of thorax reddish yellow, the praescutum with a narrow but distinct brown median stripe; antennae black throughout; halteres uniformly pale yellow; legs yellow, the terminal tarsal segments weakly darkened; wings grayish yellow, the prearcular and costal fields clear light yellow, stigma scarcely indicated; *Rs* long, about three-fourths *R*₄; *R*₂₋₃₋₄ long, subequal to vein *R*₃; cell 1st *M*₂ long and narrow, subequal to vein *M*₃ beyond it.

Female. — Length, about 7 mm.; wing, 7 mm.

Rostrum grayish pruinose; mouthparts and palpi black. Antennae black throughout; flagellar segments oval, with conspicuous verticils. Head clear light gray, with pale setae; anterior vertex broad, approximately four times the diameter of scape.

Pronotum reddish yellow, more infuscated above. Mesothorax conspicuously reddish yellow, the praescutum with a narrow but distinct brown median stripe, the scutal lobes likewise with a small brown spot; surface of thorax more or less pollinose or pruinose, more heavily pruinose on central portion of mediotergite. Halteres uniformly pale yellow. Legs with the coxae reddish yellow; remainder of legs yellow, the terminal tarsal segments weakly darkened. Wings grayish yellow, the prearcular and costal fields clear light yellow; stigma scarcely indicated; veins paler brownish yellow, clear luteous in the yellowed fields. No macrotrichia on *R*₂₋₃₋₄, these sparse and scattered on vein *R*₃, more numerous on the other veins beyond cord. Venation: *Sc*₁ ending shortly before level of fork of *Rs*; *Sc*₂ near its tip; *Rs* long, only gently arcuated at origin, only about three-fourths *R*₄; *R*₂₋₃₋₄ long, subequal to vein *M*₃ beyond it; *m-cu* about its own length beyond the fork of *M*; cell 2nd *A* relatively wide.

Abdomen with basal tergites brownish black, the outer ones somewhat paler, dark brown; intermediate segments with narrow

yellow caudal borders; basal sternites more or less darkened, the outer ones paling to obscure yellow. Ovipositor with the shield light yellow, cerci yellow basally, the narrowed distal third more blackened; cerci broad at base, nearly straight, the tips acute; hypovalvae more or less darkened basally, at tips produced into long hairlike points.

Hab. Brazil (Minas Geraes).

Holotype, female, Alto Caparaó, altitude 1,800 meters, November 1941 (Gomes).

Shannonomyia erubescens is entirely distinct from the relatively few regional species so far described, differing particularly in the pattern of the body, legs and wings, and in the venation.

Shannonomyia gracilior, sp. n.

General coloration of thorax light gray, the praescutum with three more brownish gray stripes; head gray; antennal flagellum black, the lower face of the segments bulging; dorsal thoracic pleura more or less infuscated to form a broad, very diffuse stripe; legs obscure yellow, the tips of the tibiae narrowly infuscated; wings yellow, restrictedly patterned with brown, including the small oval stigma and seams over the cord and outer end of cell *1st M*₂; *Rs* long, gently arcuated at origin, exceeding three times *R*₂₋₃₋₄, the latter about one-half *R*₃; abdomen, including hypopygium, dark brown; male hypopygium with both dististyles relatively long and slender, especially the inner one; gonapophyses long and slender, strongly curved.

Male. — Length, about 6 mm.; wing, 6.8 mm.; antenna, about 11 mm.

Rostrum black, very sparsely pruinose; palpi black. Antennae with the scape light brown; pedicel dark brown; flagellar segments black, the lower face of each bulging; segments with a dense pale pubescence and with long verticils on outer face, the longest exceeding the segments in length. Head with front and anterior vertex clear gray, the posterior vertex darker gray; anterior vertex immediately behind the antennal bases slightly elevated.

Pronotum and pretergites uniformly whitish gray, unpatterned. Mesonotal prescutum light gray, with three more brownish gray stripes, the median one more conspicuous; posterior sclerites of notum light brown, pruinose; centers of scutal lobes slightly darkened. Pleura obscure yellow on ventral half, slightly infuscated on dorsal portion, forming a broad but very diffuse dorsal stripe, heavily gray pruinose. Halteres uniformly pale yellow. Legs with

the coxae and trochanters yellow, the fore coxae narrowly darkened at base; femora and tibiae obscure yellow, the tips of the latter narrowly but conspicuously infuscated; basal tarsal segments yellow, their tips vaguely darkened, the outer segments dark brown. Wings yellowish, the prearcular and costal fields a trifle clearer yellow; stigma small, oval, brown, relatively conspicuous; vague brown clouds at origin of *Rs*, along cord and over the outer end of cell *1st M*₂; veins yellow, slightly darker in the infuscated areas. Macrotrichia of veins relatively abundant, including all longitudinal veins beyond cord, as well as the outer two-thirds of *Rs*, distal end of first section of *Cu*₁, and outer third of vein *2nd A*; vein *1st A* glabrous. Venation: *Sc*₁ ending shortly before fork of *Rs*, *Sc*₂ a short distance from its tip; *Rs* long, gently arcuated at origin, exceeding three times *R*₂₋₃₋₄, the latter approximately one-half *R*₃; cell *1st M*₂ narrow, gently widened outwardly, subequal in length to vein *M*₄ beyond it; *m-cu* approximately two-thirds to three-fourths its length beyond the fork of *M*.

Abdomen dark brown, including hypopygium, the more proximal segments a trifle paler brown. Male hypopygium (Fig. 8) with the dististyles relatively long and slender, especially the inner dististyle; outer style, *od*, more or less flattened, at apex produced into a blackened spine, the lower angle a flattened glabrous flange; outer margin of style roughened into several setigerous tubercles; inner style, *id*, slightly longer than the former, its outer margin with several coarse erect setae, the outer of these much longer than the diameter of the style opposite their insertion. Gonapophyses, *g*, appearing as long, strongly curved spines, narrowed to the acute tips. Aedeagus, *a*, relatively short and simple, not sinuous near base.

Hab. Brazil (Minas Geraes).

Holotype, male, Alto Caparaó, altitude 1,800 meters, November 1941 (Gomes).

The most similar regional species is *Shannonomyia caesia* Alexander, which differs conspicuously in the coloration of the body and wings, the details of venation, and the structure of the male hypopygium, particularly the dististyles and the gonapophyses.
