NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN ASIA (DIPTERA), VIII [1]

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THREE PLATES

The crane flies discussed in the present report are almost entirely from the mountains of Formosa, the majority being from Mount Hassen. As before, this extensive series of Tipulidæ was collected by my friend Prof. Syūti Issiki, to whom my deepest thanks are extended for the opportunity of studying these flies and retaining the material in my collection. A few additional Formosan species were collected by Doctor Shiraki and Mr. Sauter, as acknowledged in the text. Two species of *Dolichopeza* were taken in the mountains of Honshiu, Japan, by Messrs. Takahashi and Ūeno. A few additional species from western China, received through Mr. Herbert S. Parish, are discussed at this time. Except where noted to the contrary, the types of the novelties are preserved in my collection.

In order to supplement our scanty knowledge of the distribution of Formosan Tipulidæ, I am adding a complete list of the species taken by Professor Issiki on Hassensan, central Formosa, August 29 to 31, 1929, and October 21 to 26, 1929.

Tipulidæ from Hassensan, central Formosa, August 29 to 31 and October 21 to 26, 1929.

Dolichopeza (*Oropeza*) *shirakiella* (Alex.), 4,500 to 6,000 feet, August 30.

Tipula (*Tipula*) *yamata* Alex., 3,500 to 5,500 feet, October 22.

Limonia (*Discobola*) *margarita* (Alex.), 3,500 to 6,000 feet, August 31.

Limonia (*Discobola*) *taivanella* sp. nov., 6,500 to 7,500 feet, August 31; 7,500 feet, October 24.

Limonia (*Limonia*) *curvispina* Alex., 6,000 to 7,000 feet, August 30.

Limonia (*Limonia*) *ebriola* Alex., 5,600 feet, October 22.

Limonia (*Limonia*) *flavoterminalis* Alex., 6,000 feet, August 31.

Limonia (*Limonia*) *fraudulenta* Alex., 4,500 to 6,000 feet, August 30.

Limonia (*Limonia*) *koxinga* sp. nov., 4,500 to 6,000 feet, August 30.

[1] Contribution from the Department of Entomology, Massachusetts Agricultural College.

Limonia (*Limonia*) *remissa* Alex., 6,000 to 8,000 feet, October 23-24.
Limonia (*Libnotes*) *hassenana* sp. nov., 4,500 to 6,000 feet, August 30.
Limonia (*Rhipidia*) *formosana* (Alex.), 3,500 feet, October 24; 6,000 to 7,000 feet, August 30.
Limonia (*Rhipidia*) *triarmata* sp. nov., 4,500 to 6,000 feet, August 30.
Limonia (*Dicranomyia*) *depauperata* (Alex.), 3,500 feet, October 21.
Limonia (*Dicranomyia*) *nesomorio* (Alex.), 6,500 to 7,800 feet, October 26.
Limonia (*Dicranomyia*) *sordida* (Brunetti), 6,000 to 7,500 feet, August 30-31.
Limonia (*Dicranomyia*) *subpunctulata* sp. nov., 3,500 feet, October 21.
Limonia (*Geranomyia*) *alpestris* Alex., 6,500 to 7,800 feet, October 24.
Antocha (*Antocha*) *bifida* Alex., 3,600 feet, August 29.
Antocha (*Antocha*) *styx* sp. nov., 3,500 feet, October 24.
Helius (*Helius*) *attenuatus* Alex., 5,600 feet, October 22.
Helius (*Eurhamphidia*) *perelegans* sp. nov., 6,000 to 7,000 feet, August 30.
Thaumastoptera (*Taiwanita*) *issikiana* Alex., 5,600 feet, October 22.
Dicranoptycha issikina sp. nov., 3,500 to 5,500 feet, October 22.
Nipponomyia symphyletes (Alex.), 5,600 feet, October 22.
Tricyphona arisana Alex., 5,600 feet, October 22; 6,000 to 7,000 feet, August 30.
Tricyphona formosana Alex., 4,500 to 7,500 feet, August 30 and 31.
Dicranota (*Amalopina*) *delectata* sp. nov., 6,000 to 8,000 feet, October 23.
Dicranota (*Amalopina*) *gibbera* (Alex.), var., 4,500 to 6,000 feet, August 30.
Adelphomyia issikina sp. nov., 5,600 feet, October 22.
Epiphragma divisa Alex., 3,500 to 5,500 feet, October 22.
Pseudolimnophila autumnalis Alex., 5,600 to 7,800 feet, October 22 to 24.
Limnophila (*Prionolabis*) *serridentata* sp. nov., 3,500 to 8,000 feet, October 22 to 24.
Limnophila (*Dicranophragma*) *formosa* Alex., 6,000 to 7,000 feet, August 30.
Limnophila (*Dicranophragma*) *taiwanensis* Alex., 6,500 to 7,500 feet, August 31.
Atarba (*Atarbodes*) *fuscicornis* Edwards, 3,500 feet, October 21.
Atarba (*Atarbodes*) *leptoxantha* Alex., 6,000 to 7,000 feet, August 30.
Atarba (*Atarbodes*) *pallidicornis* Edwards, 4,500 to 6,000 feet, August 30; 3,500 to 5,600 feet, October 22.
Elephantomyia (*Elephantomyia*) *serotina* Alex., 6,500 to 7,800 feet, October 24.
Elephantomyia (*Elephantomyodes*) *uniformis* Alex., 4,500 to 6,000 feet, August 30.
Neolimnophila alticola Alex., 6,000 to 8,000 feet, October 23.
Toxorhina (*Ceratocheilus*) *taiwanicola* (Alex.), 3,500 to 7,000 feet, August 30 and 31.
Trentepohlia (*Mongoma*) *montina* sp. nov., 4,500 to 6,000 feet, August 30.

Gonomyia (*Progonomyia*) *confluenta* (Alex.), 3,500 to 5,500 feet, October 22.
Gonomyia (*Gonomyia*) *nansei* sp. nov., 3,600 feet, August 29; 2,500 to 5,600 feet, October 21 to 25.
Gonomyia (*Lipophleps*) *neonebulosa* sp. nov., 3,600 feet, August 29.
Dasymallomyia signata Brunetti, 3,500 feet, October 21.
Erioptera (*Empeda*) *liliputina* sp. nov., 3,600 feet, August 29.
Erioptera (*Empeda*) *minuscula* Alex., 3,600 feet, August 29; 3,500 feet, October 21.
Erioptera (*Ilisia*) *tenuisentis* Alex., 5,600 feet, October 22.
Ormosia anthracopoda sp. nov., 6,500 to 7,800 feet, October 26.
Molophilus arisanus Alex., 6,500 to 7,500 feet, August 31.
Molophilus nigritus Alex., 5,600 feet, October 22.
Styringomyia sinensis sp. nov., 2,500 to 3,500 feet, October 21 to 25.
Styringomyia taiwanensis sp. nov., 2,500 to 5,500 feet, October 21 to 25.

TIPULINÆ

DOLICHOPEZA (NESOPEZA) TARSALBA sp. nov.

General coloration black; antennæ short; terminal tarsal segments snowy white; wings tinged with blackish, the obliterative areas restricted; male hypopygium with the ninth tergite terminating in three blackened lobes, the median lobe long and slender; gonapophyses appearing as long, yellow, beaklike structures; eighth sternite only moderately enlarged, the caudal margin notched and bearing two pale lobes.

Male.—Length, about 11 millimeters; wing, 12.

Female.—Length, about 14 millimeters; wing, 13.

Frontal prolongation of head and palpi black. Antennæ of male much shorter than in *tarsalis;* scapal segments yellow, flagellum black; flagellar segments cylindrical, segments four to twelve of nearly equal length, the last segment about one-third the length of the penultimate; verticils shorter than the segments. Head yellowish brown, brighter in front, darkening to brown on posterior vertex and occiput.

Thorax chiefly brownish black, in the male with a paler median præscutal stripe; anterior dorsopleural region somewhat paler. Halteres obscure yellow, the knobs blackened. Legs with the coxæ blackened, their apices and the trochanters obscure yellow; femora, tibiæ, and basitarsi black, the femoral bases restrictedly pale; tips of basitarsi and remaining tarsal segments white. Wings with a strong blackish tinge, the oval stigma darker; a dark seam on anterior cord; obliterative areas very restricted, appearing as small areas before the stigma and across the fork of M; veins black, pale in the obliterative areas. Venation: Medial forks shallow.

Abdominal tergites brownish black, the basal sternites variegated with a broad, subapical, yellow annulus. Male hypopygium (Plate 2, fig. 25) relatively small. Ninth tergite (Plate 2, fig. 26) terminating in three blackened lobes, the median lobe slender, a little longer than the laterals. Gonapophyses (Plate 2, fig. 27) long and conspicuous, jutting from the genital chamber as yellow beaklike structures. Eighth sternite (Plate 2, fig. 28) with a deep U-shaped emargination that bears two small lobes.

Habitat.—Japan (Honshiu).

Holotype, male, Shirahone Hot Springs, Shinano, July 24, 1929 (*M. Ūeno.*) Allotopotype, female, with the type.

Dolichopeza (*Nesopeza*) *tarsalba* is most closely allied to *D.* (*N.*) *tarsalis* (Alexander), differing most conspicuously in the short antennæ of the male and details of structure of the male hypopygium.

DOLICHOPEZA (OROPEZA) SAITAMENSIS sp. nov.

General coloration brown, the præscutum with three slightly darker subnitidous stripes; head black; wings tinged with brown, with three creamy areas, the largest beyond the stigma; male hypopygium with the caudal margin of the ninth tergite a weakly chitinized pale flange, the median portion further produced into a quadrate plate.

Male.—Length, about 12 millimeters; wing, 13.5.

Frontal prolongation of head dark brown, paler laterally; palpi black. Antennæ with the scapal segments yellow, flagellar segments passing into dark brown; segments subcylindrical, the verticils relatively short and unilaterally arranged; terminal segment about two-thirds the penultimate. Head black, sparsely pruinose.

Mesonotum brown, the præscutum with three slightly darker brown, faintly shiny brown stripes; scutal lobes and scutellum dark brown; postnotum paler, with short yellow setæ. Pleura brownish testaceous. Halteres tinged with dusky. Legs with the coxæ and trochanters testaceous; remainder of legs passing into brown, the tarsi slightly paler yellow. Wings broad, tinged with brown, the stigma darker brown; cream-colored obliterative areas before and beyond the stigma, the latter very large; a third obliterative area across the base of cell 1st M_2; veins pale brown. Venation: Cell 1st M_2 relatively long and narrow.

Abdominal segments brown, indistinctly variegated with brownish yellow. Male hypopygium with the ninth tergite

(Plate 2, fig. 29) broad, the caudal margin appearing as a pale, weakly chitinized, narrow border, with a median quadrate extension that is produced into short lateral points; sublateral points slenderer; lateral arms unusually broad, the obtuse tips microscopically roughened. Outer dististyle a relatively short clavate lobe. Inner dististyle (Plate 2, fig. 30) distinctly bilobed at apex, the outer angle being produced into a slender rod, the remainder a broad, smooth, darkened blade.

Habitat.—Japan (Honshiu).

Holotype, male, Chichibu, Saitama, May 29, 1919 (*R. Takahashi*).

Dolichopeza (*Oropeza*) *saitamensis* is closest to the species *D.* (*O.*) *bispinula* (Alexander), differing in the structure of the male hypopygium, especially the armature of the ninth tergite.

LIMONIINÆ

LIMONIINI

LIMONIA (DISCOBOLA) TAIVANELLA sp. nov.

Allied to *argus;* wings with scattered brown dots in cells R and M, in addition to the ocellate pattern; male hypopygium with the caudal margin of the tergite produced into two blackened setiferous lobes that are separated by a quadrate notch; ventral dististyle an elongate-oval lobe.

Male.—Length, 6.5 to 7 millimeters; wing, 9 to 9.5.

Female.—Length, 7.5 to 8 millimeters; wing, 9 to 10.

Rostrum and palpi black, the former about one-half the remainder of head. Antennæ black, the segments with short pale apical pedicels. Head gray, variegated with blackish, the anterior vertex more silvery gray.

Pronotum greenish yellow, narrowly darkened laterally. Mesonotal præscutum olive yellow to yellow, the lateral margins brown, the median region more infuscated; scutal lobes brown; scutellum and postnotum yellow, sparsely pollinose. Pleura yellow, whitish pruinose, with two narrow brown stripes, the more dorsal extending from behind the fore coxæ, completely suffusing the pleurotergite; ventral stripe occupying the ventral sternopleurite; dorsopleural region dark, connected with the areas on the propleura and lateral margins of præscutum. Halteres black, the extreme base of stem and apical half of knob whitish. Legs with the coxæ and trochanters yellow; femora brownish yellow, the distal end light yellow, inclosing a narrow black subterminal ring that is nearly equal in width to the yellow apex; in some specimens, the basal portion of the femora is clearer yellow;

remainder of legs brownish yellow, the terminal tarsal segments passing into brownish black. Wings (Plate 1, fig. 1) yellow, with a brown ocellate pattern that is much as in *argus;* in addition, with scattered brown dots in cells R and M, these lacking in *argus*.

Abdominal tergites brown, the extreme caudal margins pale, in cases with a more yellow basal and medial ring on each segment; sternites greenish yellow, the caudal margins of the segments narrowly dark brown; hypopygium yellow. Male hypopygium (Plate 2, fig. 31) with the tergite, 9*t*, narrowed apically, each lateral angle produced into a dusky setiferous lobe, these separated by a quadrate notch. Ventromesal lobe of basistyle, *b*, very stout, occupying almost the entire face of the style. Ventral dististyle, *vd*, an elongate-oval pale lobe that is approximately twice as long as the dorsal dististyle; rostral prolongation slender, darkened, the two pale peglike spines arising from face of style above. Dorsal dististyle with the surface microscopically roughened. Gonapophyses, *g*, with the apex of mesal apical lobe bluntly obtuse.

Habitat.—Formosa.

Holotype, male, Hassensan, altitude 6,500 to 7,500 feet, August 31, 1929 (*S. Issiki*). Allotopotype, female, altitude 7,500 feet, October 24, 1929 (*S. Issiki*). Paratopotypes, 2 males; paratype, 1 female, Shōrei, altitude 7,000 to 8,000 feet, October 25, 1928 (*S. Issiki*).

Limonia (*Discobola*) *taivanella* is separated from *L.* (*D.*) *argus* (Say) chiefly by the very different structure of the male hypopygium. The female from Shōrei had earlier been recorded as *argus*.[2] The Arisan record for *argus* in the preceding part under this general title [3] is correct, and there are unquestionably three species of *Discobola* inhabiting the higher mountains of Formosa.

LIMONIA (LIMONIA) KOXINGA sp. nov.

General coloration of thorax reddish yellow, unmarked; head blackish gray; halteres relatively short, brown; legs yellow, the femoral and tibial tips narrowly blackened; wings gray, darker basally, stigma brown; narrow dark seams along cord and outer end of cell 1st M_2; male hypopygium with the tergite deeply notched; dorsal dististyle lacking; rostral prolongation of ven-

[2] Philip. Journ. Sci. 40 (1929) 526.
[3] Philip. Journ. Sci. 42 (1930) 509.

tral dististyle long and slender; a spine arising from a long basal tubercle on face of dististyle near base; tergal valves of ovipositor very small.

Male.—Length, about 7.5 to 8 millimeters; wing, 7 to 7.4.

Female.—Length, about 8.5 to 9 millimeters; wing, 7.5 to 7.6.

Rostrum shiny black; palpi brownish black. Antennæ light brown; flagellar segments oval, becoming more slender and elongate outwardly, the verticils a little exceeding the segments; terminal segment a trifle shorter than the penultimate. Head blackish gray.

Pronotum reddish yellow, more blackened anteriorly above. Thorax uniformly reddish yellow, the surface nitidous, the pleura clearer yellow. Halteres relatively short, brown, the base of the stem yellow. Legs yellow, the femoral tips narrowly but conspicuously blackened; tibiæ more narrowly darkened; tarsi gradually darkened. Wings (Plate 1, fig. 2) slightly tinged with gray, the basal cells somewhat more strongly so; cells C and Sc more yellowish; stigma brown; narrow dark seams along cord and outer end of cell 1st M_2; veins black. Venation: Sc_1 ending opposite or just beyond midlength of Rs, Sc_2 at its tip; free tip of Sc_2 and R_2 about in alignment; m-cu at or close to the fork of M.

Abdominal tergites dark brown, the caudal margins narrowly pale; sternites and hypopygium paler. Male hypopygium (Plate 2, fig. 32) with the tergite, *9t*, deeply notched medially, the conspicuous lateral lobes with long conspicuous setæ. Basistyle, *b*, with the ventromesal lobe conspicuous. Ventral dististyle, *vd*, large and fleshy, much larger than the basistyle; rostral prolongation long and slender, curved; a single powerful spine arises from the face of the ventral dististyle near base of prolongation, this spine from a longer basal tubercle. No dorsal dististyle. Gonapophyses, *g*, with the mesal apical angle elongate, gradually expanded at tip into a weak spatula. Ovipositor with the tergal valves (cerci) very small.

Habitat.—Formosa.

Holotype, male, Hassensan, altitude 4,500 to 6,000 feet, August 30, 1929 (*S. Issiki*). Allotopotype, female. Paratopotypes 1 male, 1 female.

Limonia koxinga is named from Koxinga, piratic lord of Taiwan in the seventeenth century. The species is very different from *L.* (*L.*) *alticola* (Edwards) in the details of struc-

ture though very similar in the reduced tergal valves of the ovipositor.

LIMONIA (LIBNOTES) HASSENANA sp. nov.

Female.—Length, about 7 millimeters; wing, 7.5.

Generally similar and closely allied to *L.* (*L.*) *riverai* Alexander (Luzon), differing especially in the details of venation.

General coloration dark blackish gray. Halteres darkened, the base of the stem brightened. Legs with the femora obscure yellow, scarcely darkened at tips. Wings (Plate 1, fig. 3) with Rs long and gently arcuated; Sc ending opposite r-m and thus appearing very long, the distance between origin of Rs and Sc_2 subequal to R_{2+3} and exceeding R_3 alone; free tip of Sc_2 some distance before R_2, the latter arcuate. In the absence of the male, the length of the costal fringe in this sex cannot be stated.

Habitat.—Formosa.

Holotype, female, Hassensan, altitude 4,500 to 6,000 feet, August 30, 1929 (*S. Issiki*).

LIMONIA (RHIPIDIA) TRIARMATA sp. nov.

General coloration gray; antennæ with eight flagellar segments, each bearing two branches; terminal segment oval; wings gray, variegated with white spots and dots, the cubital and anal fields more uniformly gray; Sc_1 ending about opposite one-third the length of Rs; male hypopygium with three long spines on rostral prolongation of ventral dististyle.

Male.—Length, about 6 millimeters; wing, 5.5.

Rostrum and palpi black. Antennæ with flagellar segment one merely produced beneath, segments two to nine inclusive with two branches, the longest about twice the segments; flagellar segments ten and eleven merely produced; terminal segment relatively short, oval; basal enlargements and branches dark, the long glabrous apical necks pale, these necks shortening on outer segments, on the penultimate and antepenultimate very short. Head brownish gray.

Thorax gray, the præscutum with a median brown stripe, the lateral stripes lacking or nearly so. Halteres pale, the knobs weakly infuscated. Legs brown, the segments not conspicuously variegated. Wings (Plate 1, fig. 4) gray, variegated with white spots and dots, most evident in the radial and medial fields, the cubital and anal fields almost uniformly darkened; veins brownish black. Venation: Sc_1 ending about opposite one-third the length of Rs, Sc_2 not far from its tip; m-cu before the fork of M.

Male hypopygium (Plate 2, fig. 33) much as in *maculata;* rostral prolongation of ventral dististyle, *vd,* unusually long and slender, at near midlength with three long reddish spines from a restricted point, these spines a little shorter than the prolongation.

Habitat.—Formosa.

Holotype, male, Hassensan, altitude 4,500 to 6,000 feet, August 30, 1929 (*S. Issiki*).

Limonia (*Rhipidia*) *triarmata* is evidently closely allied to *L.* (*R.*) *maculata* (Meigen) and may prove to be a geographic race of the latter. I have seen a closely allied species or race from Szechwan, China.

LIMONIA (DICRANOMYIA) SUBPUNCTULATA sp. nov.

Allied to *punctulata;* wings without spots in costal and subcostal cells except at ends of cells; male hypopygium with the rostral prolongation of the ventral dististyle elongate, with two small basal spines; gonapophyses simple at tips.

Male.—Length, about 5 to 5.3 millimeters; wing, 6.

Female.—Length, about 6.5 to 7 millimeters; wing, 6.5.

Rostrum and palpi black. Antennæ black; flagellar segments oval, gradually decreasing in size outwardly. Head dark gray; anterior vertex narrow.

General coloration of thorax gray, the præscutum with a broad median brown stripe and less distinct lateral stripes; scutellum light gray. Halteres dusky, the knobs dirty white. Legs with the coxæ dark brown, pruinose; trochanters brown; femora gradually deepening to dark brown, the extreme tips narrowly obscure yellow; tibiæ and tarsi brownish yellow, the latter blackened at tips. Wings (Plate 1, fig. 5) cream-colored, with a restricted brown pattern, including spots at arculus; tip of Sc; R_2; at intervals along cord; outer end of cell 1st M_2 and tip of R_3; small spots at two-thirds the length of R_{4+5}, midlength of distal section of M_{1+2}, midlength of M, and two spots in cell 1st A adjoining vein 2d A; cells C and Sc without darkening except at each end of cells; veins yellow, dark brown in the infuscated areas. Venation: Sc_1 ending opposite origin of Rs, Sc_2 at tip; Rs straight, oblique; cell 1st M_2 elongate; m-cu at fork of M.

Abdomen dark gray, the caudal margins of the segments paler; basal sternites obscure yellow; hypopygium dark. Male hypopygium (Plate 2, fig. 34) with the lateral lobes of the ter-

gite, 9*t*, low and obtuse, with numerous setæ. Basistyle, *b*, relatively small, the ventromesal lobe large. Ventral dististyle, *vd*, a large fleshy lobe, the rostral prolongation long and slender, at base with two small subequal spines that are less than one-half as long as the prolongation. Dorsal dististyle a gently curved chitinized rod, narrowed to the acute tip. Gonapophyses, *g*, with the mesal apical angle a simple acute spine.

Habitat.—Formosa.

Holotype, male, Meizi Hot Springs, foot of Hassensan, altitude 2,500 feet, October 25, 1929 (*S. Issiki*). Allotopotype, female, October 26, 1929 (*S. Issiki*). Paratopotypes, 20 males and females, with the type; paratypes, 1 male, Hassensan, altitude 3,500 feet, October 21, 1929 (*S. Issiki*); 1 male, Nōkō, altitude 8,000 feet, June 26, 1927 (*S. Issiki*).

Limonia (*Dicranomyia*) *subpunctulata* belongs to the *punctulata* group and has been confused with *punctulata* (de Meijere). The latter is figured by de Meijere as having a single rostral spine with its tip strongly curved; *L.* (*D.*) *fullowayi* (Alexander) has the rostral spine single, entirely straight, as long as the prolongation itself or longer. Gonapophyses with the mesal apical angle blackened, broad, more or less toothed.

LIMONIA (GERANOMYIA) APICIFASCIATA sp. nov.

General coloration reddish brown; rostrum black, the apical fourth yellow; halteres dusky; legs yellow; wings whitish hyaline with a heavy brown, chiefly costal pattern, the outermost area a complete fascia; male hypopygium with the two rostral spines arising from a long slender common tubercle.

Male.—Length, excluding rostrum, about 6 millimeters; wing, 6.8; rostrum, about 3.

Rostrum black, the apical fourth paling to yellow; palpi black. Antennæ with the scapal segments black; flagellum pale brown; flagellar segments with short inconspicuous verticils. Head gray, the anterior vertex more silvery, the posterior vertex more blackish.

Mesonotal præscutum brown, with four reddish brown stripes, the lateral portions more pruinose; scutum and scutellum pruinose, each scutal lobe with an elongate-triangular reddish brown area; postnotum pale brown, the surface pruinose. Pleura testaceous yellow. Halteres dusky, the base of the stem restrictedly yellow. Legs with the coxæ and trochanters yellowish testaceous; remainder of legs yellow, only the terminal tarsal

segments infumed. Wings (Plate 1, fig. 6) whitish hyaline, the costal region pale yellow; a heavy brown, chiefly costal pattern; six major costal areas that extend into the cells behind, the third at origin of Rs, the last a complete, transverse, nearly apical fascia; between the major areas in cells C and Sc are smaller dark spots that restrict the ground color to small areas; additional restricted brown areas along cord and outer end of cell 1st M_2 and as marginal clouds at ends of longitudinal veins and at midlength of cell 2d A; veins yellowish brown, darker in the infuscated areas. Venation: Sc long, Sc_1 opposite the fork of Rs, Sc_2 at its tip; a supernumerary crossvein in cell Sc; m-cu at fork of M; vein 2d A short, strongly curved to margin, the cell wide.

Abdominal tergites reddish brown, more blackened medially and subapically, the caudal margin narrowly pale; sternites more uniformly yellow; hypopygium brownish yellow. Male hypopygium (Plate 2, fig. 35) with the tergite, 9*t*, transverse, the caudal margin very gently emarginate. Basistyle, *b*, much smaller than the ventral dististyle, the ventromesal lobe large. Ventral dististyle, *vd*, oval, the rostral region large, produced into a very long tubercle that bears two slightly longer reddish spines. Dorsal dististyle a strongly curved sickle. Gonapophyses, *g*, with the mesal apical angle a strongly curved subacute spine.

Habitat.—Formosa.

Holotype, male, Shinten, December 3, 1928 (*S. Issiki*).

Limonia (*Geranomyia*) *apicifasciata* is very different from allied regional species of the subgenus.

ANTOCHA (ANTOCHA) STYX sp. nov.

General coloration dark gray; halteres and legs blackened; wings tinged with blackish; male hypopygium black, the outer dististyle pointed at apex; ædeagus broad.

Male.—Length, about 4.5 to 5 millimeters; wing, 5 to 5.5.

Rostrum and palpi black. Antennæ black; flagellar segments oval, gradually decreasing in size outwardly, the terminal segment about one-third longer than the penultimate; verticils very short, more conspicuous on basal and two outer segments. Head dark gray.

Mesonotum dark gray, the præscutum almost covered by still darker confluent stripes. Halteres infuscated, especially the knobs. Legs black. Wings (Plate 1, fig. 7) with a strong

blackish tinge; stigma a little darker; veins still darker brown. Venation: Sc_1 ending a short distance before the fork of the long Rs; cell 1st M_2 closed.

Abdomen blackish gray, the hypopygium black. Male hypopygium (Plate 2, fig. 36) with the caudal margin of the tergite, 9*t*, gently emarginate. Surface of basistyle, *b*, with very numerous course setæ. Outer dististyle chitinized, curved gently to an acute point, the face carinate. Inner dististyle very strongly curved. Ædeagus, *a*, broad.

Habitat.—Formosa.

Holotype, male, Meizi Hot Springs, foot of Hassensan, altitude 2,500 feet, October 26, 1929 (*S. Issiki*). Paratopotypes, 3 males, October 25, 1929 (*S. Issiki*); paratypes, 2 males, Hassensan, altitude 3,500 feet, October 24, 1929 (*S. Issiki*).

Antocha styx is readily told from all described regional species by the diagnostic features listed above.

HELIUS (EURHAMPHIDIA) PERELEGANS sp. nov.

Female.—Length, about 5.5 millimeters; wing, 5.5.

Allied to *H.* (*E.*) *inelegans* Alexander, differing especially in the venational details and pattern of the legs.

Mesonotal præscutum with the disk almost covered by three confluent brown stripes, restricting the ground color to the humeral and lateral portions; scutal lobes dark brown. Femora with the tips rather broadly and conspicuously snowy white; tibial bases narrowly pale, the tips very broadly white; tarsi white, the terminal tarsal segments darkened. Wings (Plate 1, fig. 8) with Sc short, Sc_1 ending opposite r-m, Sc_2 a little longer than Sc_1; Rs short and straight; m-cu before the fork of M.

Habitat.—Formosa.

Holotype, female, Hassensan, altitude 6,000 to 7,000 feet, August 30, 1929 (*S. Issiki*).

DICRANOPTYCHA ISSIKINA sp. nov.

General coloration of thorax brown, the præscutum with four narrow shiny black stripes, the scutal lobes further variegated with similar areas; legs yellow; wings gray, the prearcular and costal regions clear yellow; stigma elongate, brown; veins yellow, narrowly bordered on the membrane by the same color.

Male.—Length, 8.5 to 9.5 millimeters; wing, 9 to 10.5.

Rostrum brownish gray; palpi dark brown. Antennæ reddish brown, the first segment darker at base; basal flagellar segments with long conspicuous verticils, these shorter on the outer segments. Head dark brownish gray.

Mesonotal præscutum grayish brown to brown, more grayish laterally, with four narrow and incomplete shiny black stripes, the intermediate pair longer and broader; scutum brownish gray, each lobe with two shiny black areas; scutellum brownish gray, the postnotal mediotergite clearer gray. Pleura gray. Halteres yellow, the knobs a little dusky. Legs with the coxæ and trochanters brownish yellow; remainder of legs clearer yellow, with dark setæ, the outer tarsal segments darkened. Wings (Plate 1, fig. 9) gray, the prearcular and costal regions clear yellow; stigma elongate, dark brown; veins yellow, narrowly bordered on membrane by clear yellow. Venation: Rs angulated and short-spurred at origin, longer than cell 1st M_2; m-cu at before midlength of the latter.

Abdominal tergites obscure yellow, with a dorsomedian brown line; sternites clearer yellow; a conspicuous subterminal blackish gray ring involving segments six to eight; hypopygium fulvous. Male hypopygium (Plate 2, fig. 37) with the tergite transverse, the ventrolateral angles produced caudad into spatulate pale blades (lateral processes). Outer dististyle, *od*, terminating in a slender black point, the surface with abundant erect yellow setulæ, the disk and inner margin with longer recurved setæ. Inner dististyle, *id*, longer, set with spinous setæ. Gonapophyses small, slender, shorter than the bifid ædeagus, *a*.

Habitat.—Formosa.

Holotype, male Hassensan, altitude 3,500 to 5,500 feet, October 22, 1929 (*S. Issiki*). Paratopotype, male.

I take great pleasure in naming this beautiful *Dicranoptycha* in honor of the collector, Prof. Syūti Issiki, distinguished student of the Mecoptera of eastern Asia. The species is very distinct from all other members of the genus so far discovered in eastern Asia.

PEDICIINI

DICRANOTA (AMALOPINA) DELECTATA sp. nov.

General coloration pale yellow, including the legs and halteres; wings cream yellow, with a conspicuous brown pattern that includes the prearcular cells and darkened costa as far distad as the origin of Rs; supernumerary crossveins in cells R_1 and R_3; cell 1st M_2 closed.

Male.—Length, about 6 millimeters; wing, 7.

Rostrum and palpi brown. Antennæ 14-segmented; basal segment black, the remaining segments pale testaceous brown. Head ocherous, the vertex a little darkened.

Mesonotal præscutum pale yellow, with a whitish bloom; scutal lobes more darkened; scutellum and postnotum pale yellow, with a whitish bloom. Pleura pale yellow. Halteres yellow. Legs yellow, the two terminal tarsal segments brown. Wings (Plate 1, fig. 10) pale cream yellow, with a conspicuous brown pattern; prearcular region and cells C and Sc darkened to approximately opposite the origin of Rs; base of cell R darkened to opposite Sc_2; stigmal region diffusely darkened; narrow but conspicuous dark brown seams at origin of Rs, along cord and outer end of cell 1st M_2, on R_2 and the supernumerary crossvein in cell R_3, at the tips of veins R_{1+2} and R_3, and at fork of M_{1+2}; veins yellow, brown in the infuscated areas. Venation: A supernumerary crossvein in cell R_1; Rs strongly arcuated at origin; a supernumerary crossvein in cell R_3 more than its own length beyond R_2; cell 1st M_2 closed.

Abdomen with the basal segments yellow, ringed caudally with brown, the amount increasing on the outer segments; outer segments, including the hypopygium, more uniformly dark brown.

Habitat.—Formosa.

Holotype, male, Hassensan, altitude 6,000 to 8,000 feet, October 23, 1929 (*S. Issiki*).

Dicranota (*Amalopina*) *delectata* is most nearly allied to *D.* (*A.*) *dicranotoides* (Alexander) and *D.* (*A.*) *sibirica* (Alexander), differing in the wing pattern and venation.

ADELPHOMYIA ISSIKINA sp. nov.

General coloration of notum ocherous, marked with brown; knobs of halteres infuscated; legs yellow, the femoral tips conspicuously blackened; wings with the costal third cream-colored, the remainder conspicuously darkened; a sparse but heavy wing pattern; abundant macrotrichia in cells of wing beyond cord; R_2 far before fork of R_{3+4}; cell M_1 present.

Female.—Length, about 5.5 millimeters; wing, 6.

Rostrum reddish brown; palpi black. Antennæ 16-segmented, black, the flagellar segments a little paler; flagellar segments becoming more slender and elongated; verticils conspicuous. Head light brown.

Pronotum dark brown, paler behind. Mesonotum ocherous to reddish brown, the præscutum with a more or less distinct median brown stripe; scutal lobes darkened; scutellum and postnotum dark brown. Pleura chiefly dark brown, the sternopleurite, meral region, and pleurotergite more yellowish. Hal-

teres pale, the knobs infuscated. Legs with the fore coxæ infuscated, the remaining coxæ and trochanters yellow; femora yellow, the tips narrowly blackened; tibiæ yellow, the tips very narrowly blackened; tarsi yellow, passing into brown; tibial spurs distinct. Wings (Plate 1, fig. 11) with the costal third cream-colored, the central and posterior thirds darkened, the anal cells again somewhat more yellowish; a heavy dark brown pattern, arranged as follows: Origin of Rs; stigma; along cord and outer end of cell 1st M_2; veins yellow, more infuscated in the darkened regions. Abundant macrotrichia in the cells of the wing beyond the cord. Venation: Sc_1 ending nearly opposite the fork of Rs, Sc_2 some distance from its tip; Rs angulated and spurred at origin; R_2 more than one-half its length before the fork of R_{3+4}; cell M_1 present; m-cu at near midlength of cell 1st M_2; vein 2d A nearly straight.

Abdominal tergites dark brown; sternites brown basally, the caudal half obscure yellow, the amount of the latter decreasing on the outer segments. Ovipositor with the basal shields blackened; valves yellow, the sternal valves blackened ventrally.

Habitat.—Formosa.

Holotype, female, Hassensan, altitude 5,600 feet, October 22, 1929 (*S. Issiki*). Paratopotype, female.

Adelphomyia issikina is another of the very distinct species of crane flies discovered by the collector in the mountains of Formosa. I take great pleasure in dedicating the present fly to Professor Issiki who has done so much toward making known the rich tipulid fauna of the island. The present species is very distinct from all regional forms. I would believe that *Oxydiscus* de Meijere [4] is identical with *Adelphomyia,* despite the implied lack of tibial spurs, a highly variable character in this, as well as other groups of Tipulidæ.

HEXATOMINI

LIMNOPHILA (PRIONOLABIS) SERRIDENTATA sp. nov.

General coloration black, the surface opaque by a sparse pruinosity; wings grayish with vague seams on the crossveins and deflections; Sc_1 much longer than Sc_2; R_{2+3} from one-half to two-thirds R_3; cell M_1 lacking; m short and straight, less than the basal section of M_3; male hypopygium with the gonapophyses serrate along outer margin.

[4] Tijdschr. voor Entomologie 56 (1913) 350–351.

Male.—Length, about 4.3 to 5 millimeters; wing, 5 to 6.2.

Female.—Length, about 4.8 to 5.2 millimeters; wing, 5.5 to 6.

Rostrum and palpi black. Antennæ black throughout; flagellar segments oval, gradually decreasing in size outwardly, the terminal segment little larger than the penultimate; longest verticils unilaterally arranged, exceeding the segments in length. Head black, pruinose.

Thorax black, the surface pruinose, least so on the median region of præscutum. Halteres pale yellow, in cases with the knobs weakly infuscated. Legs with the fore coxæ darkened, the remaining coxæ and all trochanters yellow; femora yellow, the tips blackened; tibiæ and basitarsi similar, the tips more narrowly blackened; remainder of tarsi black; legs conspicuously hairy. Wings (Plate 1, fig. 12) grayish, the stigma and vague seams at origin of Rs, along cord and outer end of cell 1st M_2 slightly darker; veins light brown. Venation: Sc_1 ending shortly before fork of Rs, Sc_2 some distance from its tip; R_2 subequal to R_{1+2}; R_{2+3} approximately one-half to two-thirds R_3 alone; cell M_1 lacking; m straight, transverse, shorter than the arcuated basal section of M_3; m-cu close to or before midlength of cell 1st M_2.

Abdomen black, including the hypopygium, the surface more or less pruinose. Male hypopygium (Plate 3, fig. 38) with the inner dististyle, *id,* dilated at base, the outer surface with numerous erect setæ, the apex suddenly narrowed into a blackened point. Gonapophyses, *g,* appearing as slender blackened plates, the outer margin conspicuously serrate. Ædeagus, *a,* narrow, gently curved.

Habitat.—Formosa.

Holotype, male, Hassensan, altitude 6,500 to 7,800 feet, October 24, 1929 (*S. Issiki*). Allotopotype, female. Paratopotypes, 16 males and females, altitude 3,500 to 8,000 feet, October 22 to 24, 1929 (*S. Issiki*).

Limnophila (*Prionolabis*) *serridentata* is obviously closely allied to *L.* (*P.*) *liponeura* Alexander and *L.* (*P.*) *lipophleps* Alexander, of Kiushiu, Japan, differing most evidently in the structure of the male hypopygium. The somewhat similar *L. nigronitida* Edwards, likewise from the high mountains of Formosa, differs in the polished black thoracic notum and in a number of important venational characters, as the position of Sc_2, the subequal R_{2+3}, and the long oblique m.

ERIOPTERINI

TRENTEPOHLIA (MONGOMA) MONTINA sp. nov.

General coloration dark brown; legs black, the tips of the tibiæ and the tarsi paling to yellow; wings tinged with dusky; R_2 shortly before fork of R_{3+4}; fusion of Cu_1 and 1st A slight.

Male.—Length, about 6 millimeters; wing, 6.5.

Female.—Length, about 7 millimeters; wing, 6.4.

Rostrum and palpi dark brown. Antennæ black; flagellar segments with verticils of moderate length. Head black, very sparsely pruinose.

Mesonotum dark brown, the posterior margin of the scutellum and posterior half of the postnotal mediotergite more yellowish. Pleura yellowish brown, the dorsopleural region more blackish. Halteres brownish black, the base of the stem restrictedly pale. Legs with the fore coxæ dark brown, the remaining coxæ more yellowish brown; trochanters obscure yellow; femora black; tibiæ black, the tips paling to dirty yellow; tarsi yellow. Wings (Plate 1, fig. 13) with a strong dusky tinge, the stigma darker but small and ill-defined; veins brownish black. Venation: R_2 shortly before fork of R_{3+4}; m-cu at or just before the fork of M; fusion of Cu_1 and 1st A slight.

Abdomen brownish black, the sternites paler, especially in the male.

Habitat.—Formosa.

Holotype, male, Hassensan, altitude 4,500 to 6,000 feet, August 30, 1929 (*S. Issiki*). Allotopotype, female.

It is probable that the present species will be found to be a characteristic mountain form. It was associated with typical Palæarctic crane flies, as *Tricyphona formosana* Alexander and *Dicranota* (*Amalopina*) *gibbera* (Alexander), var.

GONOMYIA (PROGONOMYIA) CONFLUENTA (Alexander).

Gnophomyia confluenta ALEXANDER, Ann. Ent. Soc. America 17 (1924) 69.

Two males from Hassensan, altitude 3,500 to 5,500 feet, October 22, 1929 (*S. Issiki*). The venation (Plate 1, fig. 14) shows a long Sc, Sc_1 ending opposite the fork of Rs or nearly so, Sc_2 at near middistance between origin of Rs and tip of Sc_1; cell R_3 relatively deep; m-cu at or close to the fork of M.

The male hypopygium (Plate 3, fig. 39) has the outer lobe of the basistyle, *b*, stout. Three dististyles, the outer a slender curved rod from an enlarged base; second dististyle bifid at

apex, the stem with erect conspicuous setæ; inner style simple, stouter than the first, the apex obtuse. Ædeagus, *a*, compressed.

The species is very different from *G.* (*P.*) *scutellum-album* Alexander, likewise from the Formosan mountains, in the uniformly black coloration and very different male hypopygium.

GONOMYIA (GONOMYIA) NANSEI sp. nov.

General coloration dark brown; rostrum and antennæ black; head dark gray; pleura yellow, more or less distinctly variegated with brown; halteres dusky; legs brown; wings gray, the stigmal region more infuscated; male hypopygium with the outer dististyle a slender setiferous rod; phallosome with three spinous points.

Male.—Length, about 3.5 to 4 millimeters; wing, 4.5 to 5.

Female.—Length, about 4.5 to 4.8 millimeters; wing, 5 to 5.4.

Rostrum and palpi black. Antennæ black throughout, the outer flagellar segments very slender. Head dark gray.

Pronotum and anterior lateral pretergites light sulphur yellow. Mesonotum dark brown, very sparsely pruinose, the lateral and humeral regions of the præscutum yellow; scutellum light sulphur yellow; postnotal mediotergite gray. Pleura yellow, with more or less distinct darkened areas on the anepisternum and on ventral sternopleurite. Halteres elongate, dusky, the extreme base of stem yellow. Legs with the coxæ brownish testaceous; trochanters yellow; remainder of legs pale brown, the outer tarsal segments deepening to black. Wings (Plate 1, fig. 15) gray, the stigmal region more infuscated; veins darker brown. Venation: Sc_1 ending just beyond origin of Rs, Sc_2 close to its tip; cell 1st M_2 closed; m-cu at or close to fork of M.

Abdominal tergites brownish black, the sternites more yellowish. Male hypopygium (Plate 3, fig. 40) with the outer dististyle a slender setiferous rod. Inner dististyle, *id*, a flattened chitinized plate, the outer lateral angle produced into a curved blackened spine, the inner lateral angle less produced; mesal margin produced into a fleshy setiferous lobe. Phallosome, *p*, with three blackened spines, two apparently borne by an apophysal structure, the third at apex of ædeagus.

Habitat.—Formosa.

Holotype, male, Hassensan, altitude 5,600 feet, October 22, 1929 (*S. Issiki*). Allotopotype, female. Paratopotypes, 1 male, altitude 3,600 feet, August 29, 1929; 4 males and females, altitude 2,500 to 5,600 feet, October 21 to 25, 1929 (*S. Issiki*).

The specific name, *nansei,* is that of a local Formosan tribe. The fly is distinguished from all similar regional species by the structure of the male hypopygium.

GONOMYIA (LIPOPHLEPS) SAUTERI sp. nov.

General coloration dark brown; rostrum, palpi, and antennæ black; head gray; pleura dark, with a silvery white longitudinal stripe; halteres dusky; wings unmarked except for a diffuse stigma; Sc long; male hypopygium with two dististyles, the outer terminating in an acute blackened point.

Male.—Length, about 3.3 millimeters; wing, 4.1.

Rostrum and palpi brownish black. Antennæ black throughout; flagellar segments elongate, clothed with a long erect white pubescence, in addition to the longer unilaterally arranged verticils. Head dark gray, with a small yellow area on the posterior vertex.

Pronotum and anterior lateral pretergites light sulphur yellow. Mesonotal præscutum and scutal lobes uniformly dark grayish brown; median region of scutum and the scutellum except for a basal darkening obscure yellow; postnotum dark, heavily pruinose, the anterolateral portions more yellowish. Pleura dark, with a broad silvery white longitudinal stripe, extending from and including the fore coxæ, reaching the abdomen; pleurotergite chiefly yellow. Halteres dusky, including the knobs. Legs with the fore coxæ as described, the other coxæ darker, their tips pale; trochanters testaceous yellow; femora brownish yellow, passing into darker brown at tips; tibiæ and tarsi uniform brown. Wings (Plate 1, fig. 16) with a brownish tinge, the prearcular and costal regions more yellowish; the very diffuse stigma a little darker than the ground color; veins brown. Venation: Sc long, Sc_1 extending to shortly before midlength of the long Rs, Sc_2 some distance from its tip; branches of Rs strongly divergent; R_5 and M_{1+2} deflected toward one another at margin, narrowing the cell; cell 1st M_2 narrowed at base.

Abdominal tergites uniformly dark brown, the hypopygium more yellowish. Male hypopygium (Plate 3, fig. 41) with two dististyles, the outer, *od,* a slender rod that gradually narrows to an acute blackened point, the base of the latter with numerous setæ. Inner dististyle a small pale lobe that is a little shorter than the apical lobe of the basistyle, terminating in a fasciculate bristle and with a very long slender seta on outer margin beyond

midlength. Phallosome, *p*, appearing as a broad pale plate, the surface laterally with abundant microscopic setulæ, the tip produced into a glabrous portion; two additional elongate rods, the shorter from an enlarged base.

Habitat.—Formosa.

Holotype, male, Daitotei, April 1914 (*H. Sauter*).

Type in the collection of the Deutsches Entomologisches Museum.

Gonomyia (*Lipophleps*) *sauteri* is named in honor of Mr. H. Sauter, well-known collector of Formosan insects. The species is very distinct from *G.* (*L.*) *longiradialis* Alexander (Luzon) and *G.* (*L.*) *skusei* Alexander (eastern Australia) in the structure of the male hypopygium. This is very probably the species recorded as *skusei* (*gracilis* Skuse, preoccupied) by Riedel [5] from Macuyama, Formosa.

GONOMYIA (LIPOPHLEPS) NEONEBULOSA sp. nov.

General coloration dark brownish gray; pleura dark, with a yellowish white longitudinal stripe; femora brownish black; wings gray, variegated with brownish gray; costal region pale yellow; abdomen grayish black, the caudal margins of the segments narrowly yellow.

Female.—Length, about 4.5 millimeters; wing, 4.1.

Rostrum and palpi black. Antennæ with the scapal segments obscure orange; flagellum black. Head orange, the disk of the vertex darkened.

Pronotum and anterior lateral pretergites light yellow, the former darkened laterally. Mesonotum dark brownish gray, the caudal margin of the scutellum broadly yellow; postnotal mediotergite pale, with a little less than the distal half darkened. Pleura dark, with a broad, yellowish white, longitudinal stripe extending from and including the fore coxæ, passing beneath the halteres to the abdomen; dorsal pleurites brown, the ventral sclerites more bluish gray. Halteres with the stem dusky at base, the distal half yellow; knobs dusky, the ends conspicuously yellow. Legs with the fore coxæ yellow; remaining coxæ similar, the bases narrowly darkened; femora brownish black beyond the base, the extreme tips on lower surface a little brightened; tibiæ and tarsi brownish black. Wings (Plate 1, fig. 17) with the ground color gray, variegated with darker brownish gray clouds; cells C and Sc pale yellow; stigma not darker than the

[5] Archiv für Naturgeschichte 82 for 1916, Abteil. A (1917) 112.

remaining dark areas; darkened clouds occupying most of radial field, except an area in outer end of cell R; other fields of wing merely streaked with dark; veins brown, Sc yellow. Venation: Sc_1 ending some distance before origin of Rs, the latter vein sinuous at end; anterior branch of Rs relatively long and straight, cell R_2 being nearly parallel; m-cu close to fork of M.

Abdomen grayish black, the caudal margins of the segments narrowly yellow.

Habitat.—Formosa.

Holotype, female, Meizi Hot Springs, foot of Hassensan, altitude 2,500 feet, October 25, 1929 (*S. Issiki*). Paratopotype, female; paratype, 1 sex?, Hassensan, altitude 3,600 feet, August 29, 1929 (*S. Issiki*).

By Edwards's key to the Oriental species of *Lipophleps* [6] the present species runs to *G.* (*L.*) *robinsoni* Edwards, of the Federated Malay States, differing in slight details of coloration and venation.

GONOMYIA (LIPOPHLEPS) SINUOSA sp. nov.

General coloration brown; basal segments of antennæ orange; head yellow, the center of the vertex blackened; a conspicuous silvery longitudinal stripe on pleura; legs brownish yellow, the tarsi passing into black; wings brownish yellow, the stigmal and axillary regions a little darkened; anterior branch of Rs sinuous on distal third.

Female.—Length, about 5 millimeters; wing, 4.5.

Rostrum and palpi black. Antennæ with scapal segments orange, the flagellum black. Head yellow, the center of the vertex blackened.

Pronotum and anterior lateral pretergites light sulphur yellow, the former dark brown on sides. Mesonotum light brown, slightly darker medially; scutal lobes brown, the median region yellow; scutellum brown, narrowly margined caudally with paler; postnotum pale, sparsely pruinose. Pleura light brown, with a conspicuous silvery white longitudinal stripe extending from behind the fore coxæ to the base of the abdomen, this passing beneath the halteres; the stripe is margined both above and below by a narrower infuscated line; ventral sternopleurite and dorsal pleurites, including the pleurotergite, more buffy yellow. Halteres yellow, the knobs a little more obscure. Legs with the coxæ and trochanters yellow; femora obscure brownish yellow,

[6] Journ. Fed. Malay St. Mus. 14 (1928) 104–105.

the tibiæ gradually darkening; tarsi passing into black. Wings (Plate 1, fig. 18) with a faint brownish yellow tinge; costal region clearer yellow; stigma appearing as a longitudinal dusky streak in cell R_2, the remainder of the region yellow; axillary region a little darkened; outer ends of the radial cells slightly darkened; veins pale brown, Sc yellower. Venation: Sc short, Sc_1 ending some distance before the origin of Rs, the latter angulated at origin; anterior branch of Rs sinuous, the distal third arcuate and evidently marking the point of departure of a small cephalic branch, R_3, normally present in the *sulphurella* group; m-cu shortly before the fork of M.

Abdominal tergites brown, the segments narrowly margined caudally with pale yellow; sternites more yellowish, the caudal margins narrowly paler yellow, the lateral margins narrowly infuscated, most distinct on the basal segments.

Habitat.—Formosa.

Holotype, female, Meizi Hot Springs, foot of Hassensan, altitude 2,500 feet, October 25, 1929 (*S. Issiki*).

Gonomyia (*Lipophleps*) *sinuosa* is well distinguished from other regional species by the details of coloration and venation. The course of the anterior branch of Rs is very peculiar and suggestive.

CRYPTOLABIS (BAEOURA) TRICHOPODA sp. nov.

General coloration black; head gray; halteres with yellow knobs; legs brown, conspicuously hairy; wings strongly tinged with blackish, streaked longitudinally with pale; cell 2d A narrow; male hypopygium with the dististyle a simple curved blade, the tip acute.

Male.—Length, about 3.8 millimeters; wing, 4.5.

Rostrum and palpi dark brown. Antennæ black throughout; second scapal segment oval; flagellar segments gradually decreasing in size outwardly; verticils elongate. Head dull gray, the orbits paler.

Pronotum black. Mesonotum black, the very restricted anterior and posterior lateral pretergites, together with the humeral region of the præscutum yellow; scutellum orange, the base blackened medially. Pleura black. Halteres black, the knobs and extreme base of stem yellow. Legs with the coxæ black; trochanters brownish yellow; femora and tibiæ brown, the tips darker; tarsi more blackened; segments of legs with very long conspicuous erect setæ. Wings (Plate 1, fig. 19)

strongly tinged with blackish, the elongate stigmal region slightly darker; pale longitudinal streaks in costal region, and along veins M, M_{3+4}, and 1st A; veins dark brown. Macrotrichia of veins long and conspicuous. Venation: Sc_1 ending opposite fork of Rs, Sc_2 some distance from tip of Sc_1; cell 2d A narrow.

Abdomen dark brown, the hypopygium blackened, the dististyles yellow. Male hypopygium (Plate 3, fig. 42) with the dististyle, *d*, a curved blade that terminates in an acute point, the distal half with numerous small setæ. What may be a tergal structure appears as two pale truncated cushions, densely set with short setulæ, each lobe with a single longer bristle. There is a possibility that these structures are really gonapophyses, but if so they are very different from those of other allied species.

Habitat.—Formosa (south).

Holotype, male, Keinensan, near Heito, altitude 5,000 feet, March 13, 1929 (*S. Issiki*).

Cryptolabis trichopoda is very distinct from *C. aliena* (Alexander), the only other Formosan species of the genus. In general appearance it is more like the Indian *C. funebris* (Alexander), differing conspicuously in the structure of the dististyles of the male hypopygium.

ERIOPTERA (EMPEDA) SULFUREOCLAVATA sp. nov.

General coloration gray; scapal segments of antennæ black; legs light brown; halteres with conspicuous sulphur yellow knobs; wings gray, the stigmal region scarcely darker; Sc long; anal veins strongly divergent; male hypopygium with the dististyles unblackened.

Male.—Length, about 2.8 millimeters; wing, 3.5.

Rostrum gray; palpi black. Antennæ with the scapal segments black, the flagellum pale brownish yellow, the outer segments darker. Head light gray.

Mesonotum dark brownish gray, the lateral pretergites light sulphur yellow, the posterior sclerites of notum clearer gray. Pleura dark gray, the dorsopleural region pale yellowish white. Halteres pale, the knobs light sulphur yellow. Legs with the fore coxæ dark brown, the remaining coxæ and trochanters brownish yellow; remainder of legs light brown, the terminal tarsal segments darker. Wings (Plate 1, fig. 20) broad, iridescent gray, the prearcular and costal portions more yellowish;

stigma scarcely darker; veins pale brown, those in the costal region more yellowish. Macrotrichia of veins relatively short. Venation: Sc long, Sc_1 ending beyond midlength of Rs, Sc_2 a short distance from its tip; R_3 of moderate length, longer than R_{3+4}; m-cu at fork of M; vein 2d A short and nearly straight, the anal veins strongly divergent; cell 1st A very wide at margin.

Abdomen dark brown, the incisures narrowly pale; hypopygium yellow. Male hypopygium (Plate 3, fig. 43) with the outer lobe of basistyle, *b*, terminating in two or three very long setæ; inner lobe stouter, densely set with erect setæ. Dististyles both broad, not blackened, the outer style bifid.

Habitat.—China (Szechwan).

Holotype, male, Mount Omei, altitude 4,500 feet, August 14, 1929 (*ex Parish*).

Erioptera (*Empeda*) *sulfureoclavata* is readily separated from all regional species with long subcosta by the coloration, as the conspicuous sulphur yellow knobs of the halteres, and the venation, as the length and course of vein R_3 and the strong divergence of the anal veins.

ERIOPTERA (EMPEDA) LILIPUTINA sp. nov.

Size very small (wing, male, 2.6 millimeters); general coloration grayish black; halteres dusky, the knobs obscure yellow; legs black; wings strongly suffused with blackish; Sc long; cell 1st M_2 closed.

Male.—Length, about 2 millimeters; wing, 2.6.

Rostrum and palpi brownish black. Antennæ black throughout. Head dark brownish gray.

Pronotum brownish black. Anterior lateral pretergites very restrictedly obscure yellow. Mesonotum dull grayish black, the pseudosutural foveæ and tuberculate pits more intense black; scutellum somewhat more pruinose. Pleura grayish black. Halteres dusky, the knobs obscure yellow. Legs with the coxæ blackish; trochanters brownish yellow; remainder of legs brownish black. Wings (Plate 1, fig. 21) with a strong blackish suffusion, the veins darker. Venation: Sc long, Sc_1 extending to beyond one-third the length of Rs, Sc_2 a short distance from its tip; Rs relatively long and straight; vein R_3 straight, the cell thus pointed at base; cell 1st M_2 closed; m-cu erect, placed just beyond the fork of M.

Abdomen black, including the hypopygium. Male hypopygium with the outer dististyle blackened, the dististyle bifid, the outer arm densely covered with microscopic setulæ. Inner

dististyle a straight slender rod, the apex obtuse. Gonapophyses appearing as pale flattened blades.

Habitat.—Formosa.

Holotype, male, Hassensan, altitude 3,600 feet, August 29, 1929 (*S. Issiki*).

Erioptera (*Empeda*) *liliputina* is readily told from all described regional species by the small size and venation, notably the closed cell 1st M_2.

ORMOSIA ANTHRACOPODA sp. nov.

General coloration gray; halteres yellow; legs black; wings cream-colored, with a sparse brown pattern; male hypopygium with the apex of the basistyle produced into a small spine.

Male.—Length, about 6 millimeters; wing, 7.

Rostrum and palpi black. Antennæ black throughout, of moderate length; verticils of the basal flagellar segments long, becoming shorter on the outer segments. Head gray.

Mesonotal præscutum light gray with four darker brownish gray stripes that are inconspicuous against the ground color; pseudosutural foveæ and tuberculate pits black; scutal lobes brownish gray; scutellum and postnotum clearer gray. Pleura clear gray. Halteres yellow. Legs with the coxæ and trochanters brownish yellow; remainder of legs black. Wings (Plate 1, fig. 22) cream-colored, with a slight brownish tinge; stigma brown; restricted darker brown clouds at origin of Rs, Sc_2, along cord, m, and tips of most longitudinal veins; relatively inconspicuous whitish areas before and beyond the stigma; veins brown, darker in the clouded areas. Venation: Sc_1 ending opposit R_2; Sc_2 about opposite one-fifth the length of Rs; R_2 just beyond the fork of R_{2+3+4}; tips of veins R_3 and R_4 deflected cephalad; point of union of distal section of M_3 with m angulated and weakly spurred; m-cu shortly before fork of M; vein 2d A sinuous on distal half.

Abdomen brownish gray, the hypopygium dark. Male hypopygium (Plate 3, fig. 44) with the tip of the basistyle, *b*, produced into a small acute spine. Two dististyles, one a strongly curved sickle-shaped spine, extended into a long straight blackened point, the margin with very long erect setæ; second dististyle nearly straight, the basal half more dilated. Gonapophyses small, in general outline nearly like the inner dististyle, the apical spine more acute.

Habitat.—Formosa.

Holotype, male, Hassensan, altitude 6,500 to 7,800 feet, October 26, 1929 (*S. Issiki*).

Ormosia anthracopoda is very distinct from the other species of the genus described from Formosa. It belongs to the *aculeata* group, having the apex of the basistyle of the male hypopygium produced into an acute spine.

STYRINGOMYIA TAIWANENSIS sp. nov.

General coloration pale yellow; legs uniformly yellow or with scarcely indicated pale brown bands on femora; wings yellow, the veins along cord and outer ends of cell 1st M_2 a little darker; vein 2d A gently curved to the margin; male hypopygium with three apical spines on basistyle, one more isolated and terminating in an obtuse knob that is further abruptly narrowed into a hairlike spine.

Male.—Length, about 7 millimeters; wing, 5 to 5.5.

Female.—Length, about 5 to 5.5 millimeters; wing, 5 to 5.4.

Rostrum yellow; palpi alternately yellow and dark brown. Antennal flagellum pale yellow, the scapal segments scarcely darker. Head light sulphur yellow.

Pronotum sulphur yellow. Mesonotum more testaceous yellow, without dark markings. Pleura testaceous yellow. Halteres pale, the knobs light yellow. Legs uniformly yellow, in cases the femora with scarcely indicated pale brown bands; terminal tarsal segments black. Wings (Plate 1, fig. 23) yellow, with a sparse brown clouding along the cord and outer end of cell 1st M_2, most evident on r-m; veins yellow, darker in the infuscated areas. Venation: Vein 2d A curved gently to the margin.

Abdomen yellow, the caudal margins of the intermediate tergites narrowly dark brown. Male hypopygium (Plate 3, fig. 45) with the ninth sternite, 9*s*, broad, the apical spines widely separated. Basistyle terminating in three conspicuous spines, two being long and extended into acute points, the third arising from a separate apical lobe of the basistyle, knobbed at apex, thence further produced into a hairlike point. Dististyle, *d*, complicated in structure, the long slender outer arm bearing a very elongate subterminal seta; margin of arm near base with a series of peglike spines. Spines of intermediate arms of dististyle unusually long and slender.

Habitat.—Formosa.

Holotype, male, Hassensan, altitude 3,500 feet, October 21, 1929 (*S. Issiki*). Allotopotype, female, in copula with the type.

Paratopotypes, 6 males and females, altitude 2,500 to 5,500 feet, October 22 to 25, 1929 (*S. Issiki*); paratype, 1 female, Funkiko, April 21, 1917 (*T. Shiraki*).

Styringomyia taiwanensis has been confused with *flava* Brunetti and the paratype was earlier recorded as being that species.[7] The present form differs in the coloration of the wings and details of structure of the male hypopygium.

STYRINGOMYIA SINENSIS sp. nov.

General coloration yellow, the mesonotum largely black, more or less variegated with pale at the suture; halteres yellow; femora and tibiæ with narrow brownish black rings; wings yellow, with a sparse dark pattern, including the vicinity of r-m, outer end of cell 1st M_2 and end of vein 2d A; small dark marginal spots at ends of medial and cubital veins; vein 2d A strongly angulated and weakly spurred at margin; male hypopygium with the dististyle very large and complex, four-lobed, the two intermediate lobes with combs of spines.

Male.—Length, about 7 to 8 millimeters; wing, 5.2 to 6.

Female.—Length, about 6 to 6.5 millimeters; wing, 4.6 to 5.

Antennæ with the scape black; flagellum yellow. Head chiefly ocherous; a dark spot touching inner margin of eye at narrowest point of vertex.

Mesonotum extensively to almost entirely blackened, more or less pruinose, in certain of the specimens brightened at the suture; the amount of pale coloring variable, in some specimens involving the posterior third of the præscutum and the scutal lobes, the anterior portion of præscutum always blackened. Pleura abruptly and uniformly yellow. Halteres pale, the knobs bright yellow. Legs with the coxæ and trochanters yellow; femora yellow, with two narrow dark rings that are interrupted beneath; tibiæ yellow, the tips narrowly blackened, with a narrower ring at just before midlength, this obsolete on lower surface; tarsi yellow, the tips of tarsal segments one and two darkened; terminal segment dark brown. Wings (Plate 1, fig. 24) yellow, the veins a little darker yellow; a restricted dark pattern, arranged as follows: At r-m, involving the ends of all surrounding veins; outer end of cell 1st M_2; on m-cu and its junction with Cu_1; tip of 2d A; small darkened marginal areas at ends of veins R_5 to Cu_1, inclusive. Venation: 2d A angularly

[7] Ann. Ent. Soc. America 13 (1920) 253.

bent into the margin, this curvature rectangular or acute, usually with a short spur at the bend.

Abdomen yellow, the tergites with geminate brown spots at caudal margin, with vague indications of paler brown markings on the basal ring; on segment seven with a median brown stripe; hypopygium pale. Male hypopygium (Plate 3, fig. 46) with the dististyle, *d*, four-lobed, the outer lobe long and slender, bearing the usual very long apical seta; second arm bilobed at apex, the margin with groups of long black spines to produce a comblike appearance; third lobe flattened, with a ⌒-shaped series of shorter peglike spines; innermost lobe bearing an apical series of very long setoid spines. Ninth sternite, 9*s*, slender, with two apical setæ that are placed close together. Ninth tergite without lateral shoulders, as found in *mahensis*.

Habitat.—Western China and Formosa.

Holotype, male, Mount Omei, Szechwan, China, altitude 4,500 feet, August 4, 1929 (*ex Parish*). Allotopotype, female. Paratopotypes, 15 males and females, August 2 to 19, 1929; paratypes, 8 males and females, Hassensan, Formosa, altitude 2,500 to 3,500 feet, October 21 to 25, 1929 (*S. Issiki*).

By Edwards's key to the species of *Styringomyia* [8] the present fly runs to *S. mahensis* Edwards, an otherwise very different fly. The structure of the male hypopygium separates *S. sinensis* from all regional forms.

[8] Trans. Ent. Soc. London (1914) 210–212.

ILLUSTRATIONS

[Legend; *a*, ædeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *id*, inner dististyle; *od*, outer dististyle; *p*, phallosome; *s*, sternite; *t*, tergite; *vd*, ventral dististyle.]

PLATE 1

FIG. 1. *Limonia* (*Discobola*) *taivanella* sp. nov., venation.
2. *Limonia* (*Limonia*) *koxinga* sp. nov., venation.
3. *Limonia* (*Libnotes*) *hassenana* sp. nov., venation.
4. *Limonia* (*Rhipidia*) *triarmata* sp. nov., venation.
5. *Limonia* (*Dicranomyia*) *subpunctulata* sp. nov., venation.
6. *Limonia* (*Geranomyia*) *apicifasciata* sp. nov., venation.
7. *Antocha* (*Antocha*) *styx* sp. nov., venation.
8. *Helius* (*Eurhamphidia*) *perelegans* sp. nov., venation.
9. *Dicranoptycha issikina* sp. nov., venation.
10. *Dicranota* (*Amalopina*) *delectata* sp. nov., venation.
11. *Adelphomyia issikina* sp. nov., venation.
12. *Limnophila* (*Prionolabis*) *serridentata* sp. nov., venation.
13. *Trentepohlia* (*Mongoma*) *montina* sp. nov., venation.
14. *Gonomyia* (*Progonomyia*) *confluenta* Alexander, venation.
15. *Gonomyia* (*Gonomyia*) *nansei* sp. nov., venation.
16. *Gonomyia* (*Lipophleps*) *sauteri* sp. nov., venation.
17. *Gonomyia* (*Lipophleps*) *neonebulosa* sp. nov., venation.
18. *Gonomyia* (*Lipophleps*) *sinuosa* sp. nov., venation.
19. *Cryptolabis* (*Baeoura*) *trichopoda* sp. nov., venation.
20. *Erioptera* (*Empeda*) *sulfureoclavata* sp. nov., venation.
21. *Erioptera* (*Empeda*) *liliputina* sp. nov., venation.
22. *Ormosia anthracopoda* sp. nov., venation.
23. *Styringomyia taiwanensis* sp. nov., venation.
24. *Styringomyia sinensis* sp. nov., venation.

PLATE 2

FIG. 25. *Dolichopeza* (*Nesopeza*) *tarsalba* sp. nov., male hypopygium, lateral.
26. *Dolichopeza* (*Nesopeza*) *tarsalba* sp. nov., male hypopygium, ninth tergite.
27. *Dolichopeza* (*Nesopeza*) *tarsalba* sp. nov., male hypopygium, gonapophysis.
28. *Dolichopeza* (*Nesopeza*) *tarsalba* sp. nov., male hypopygium, eighth sternite.
29. *Dolichopeza* (*Oropeza*) *saitamensis* sp. nov., male hypopygium, ninth tergite.
30. *Dolichopeza* (*Oropeza*) *saitamensis* sp. nov., male hypopygium, inner dististyle.

FIG. 31. *Limonia* (*Discobola*) *taivanella* sp. nov., male hypopygium.
32. *Limonia* (*Limonia*) *koxinga* sp. nov., male hypopygium.
33. *Limonia* (*Rhipidia*) *triarmata* sp. nov., male hypopygium.
34. *Limonia* (*Dicranomyia*) *subpunctulata* sp. nov., male hypopygium.
35. *Limonia* (*Geranomyia*) *apicifasciata* sp. nov., male hypopygium.
36. *Antocha* (*Antocha*) *styx* sp. nov., male hypopygium.
37. *Dicranoptycha issikina* sp. nov., male hypopygium.

PLATE 3

FIG. 38. *Limnophila* (*Prionolabis*) *serridentata* sp. nov., male hypopygium.
39. *Gonomyia* (*Progonomyia*) *confluenta* (Alexander), male hypopygium.
40. *Gonomyia* (*Gonomyia*) *nansei* sp. nov., male hypopygium.
41. *Gonomyia* (*Lipophleps*) *sauteri* sp. nov., male hypopygium.
42. *Cryptolabis* (*Baeoura*) *trichopoda* sp. nov., male hypopygium.
43. *Erioptera* (*Empeda*) *sulfureoclavata* sp. nov., male hypopygium.
44. *Ormosia anthracopoda* sp. nov., male hypopygium.
45. *Styringomyia taiwanensis* sp. nov., male hypopygium.
46. *Styringomyia sinensis* sp. nov., male hypopygium.

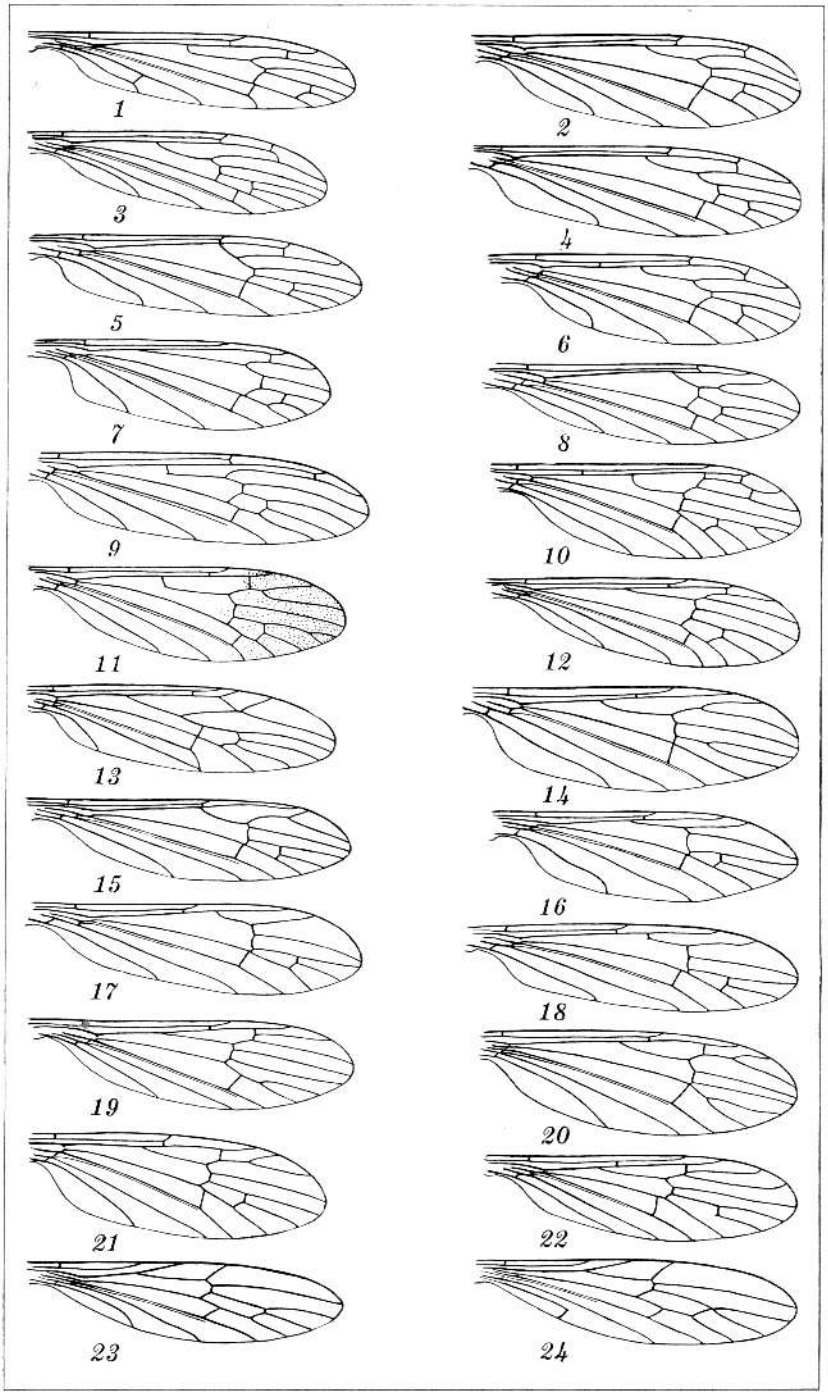

PLATE 1.

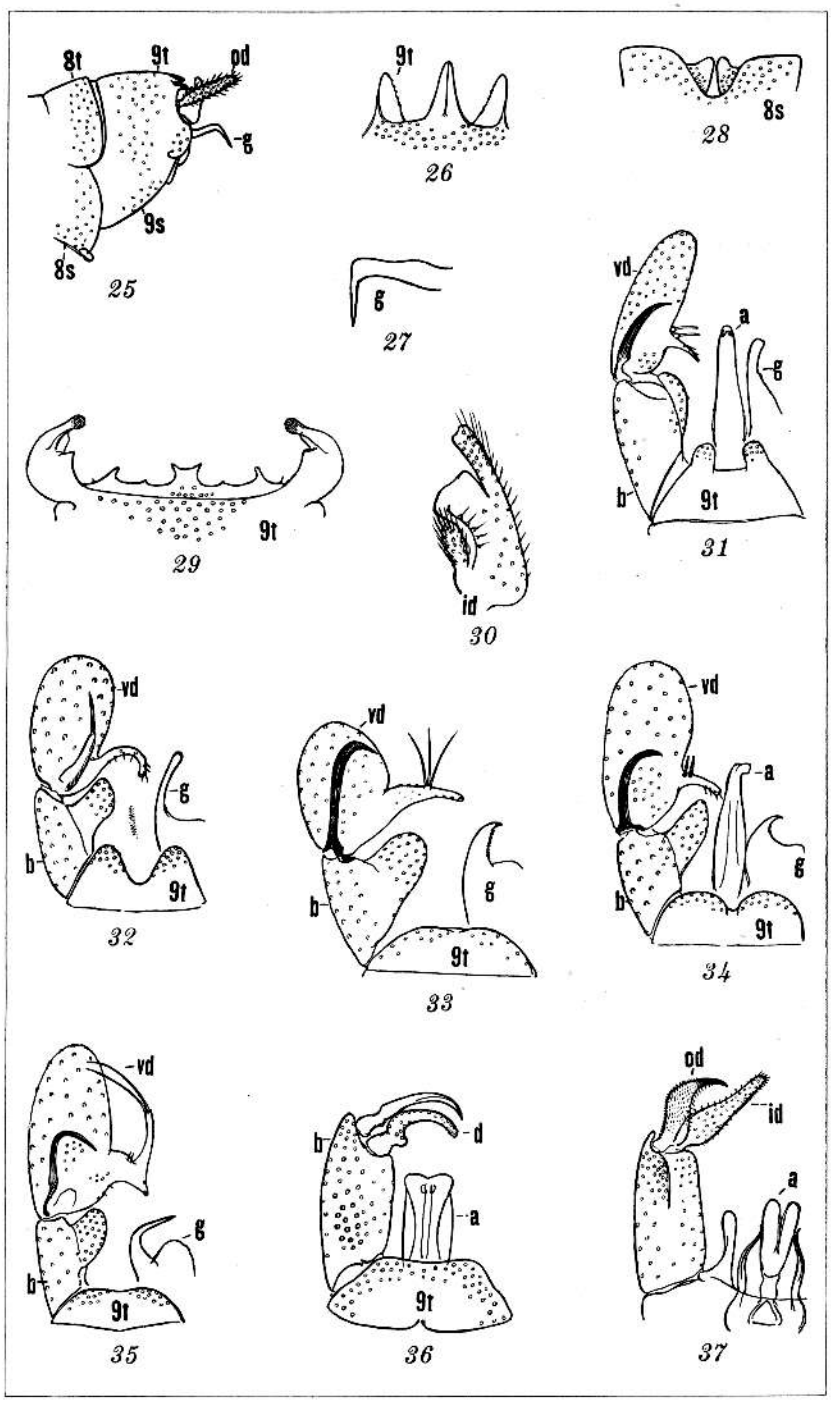
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PLATE 2.

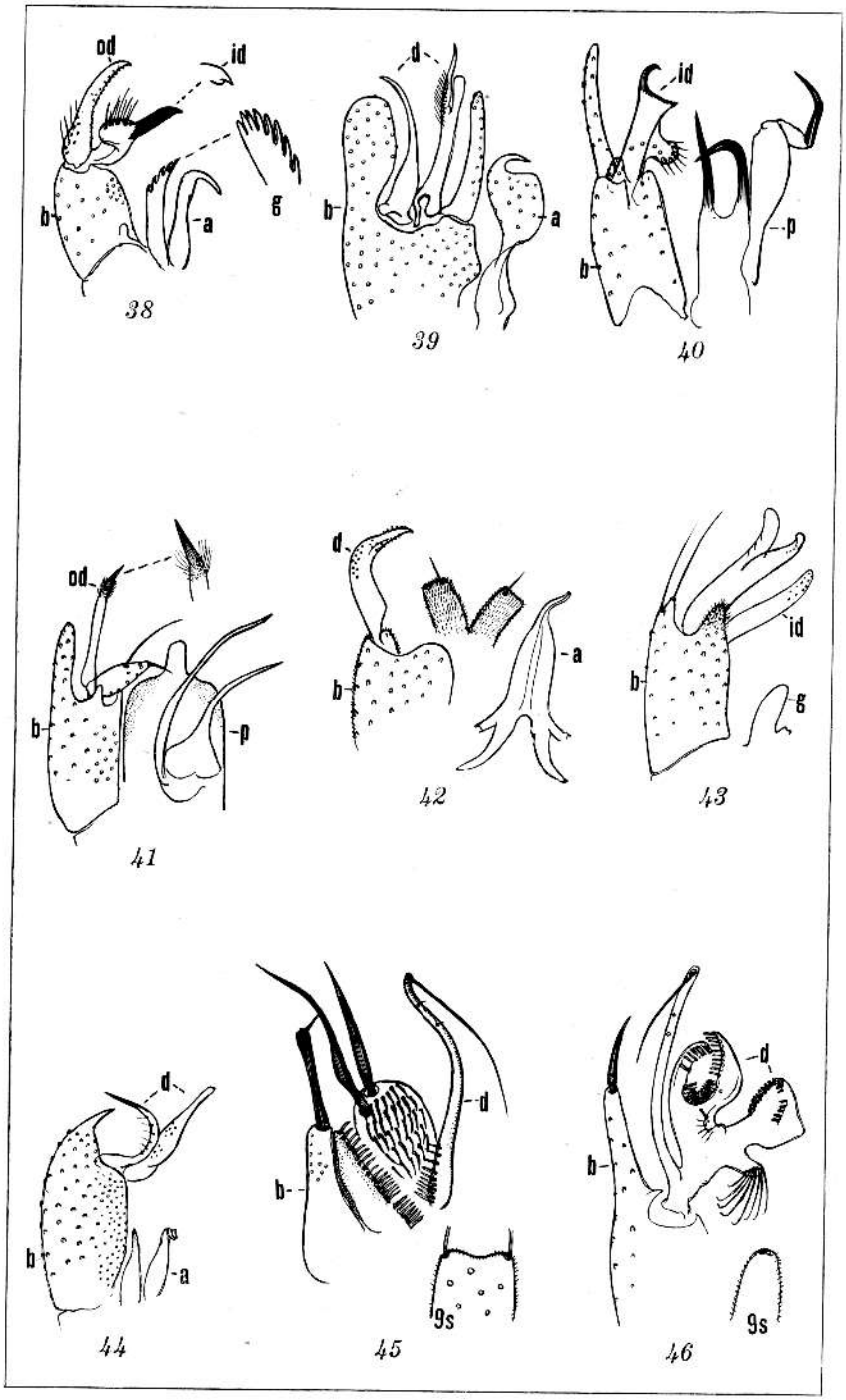
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PLATE 3.