

NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN ASIA (DIPTERA), XXVI¹

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THREE PLATES

The majority of the species of crane flies discussed in the present report are from western China, where they were collected by the Rev. Mr. George M. Franck and by the Rev. Mr. David C. Graham. A further considerable series was taken in Formosa and the Loochoo Islands by Mr. J. Linsley Gressitt. Smaller series were taken in eastern China by Mr. E. Suenson and in Formosa by Prof. Teiso Esaki. One further interesting species from Siam was sent to me for study from the American Museum of Natural History, through the friendly interest of Dr. C. Howard Curran. The extensive Graham collections are preserved in the United States National Museum, the other species in my own collection of Tipulidæ. As a result of the present survey, four generic groups are added to the Tipuloidea of China; namely, *Ptychoptera*, *Paracladura*, *Phalacrocera*, and *Gymnastes*. For convenience of treatment I have included various records of the tipuloidean families Ptychopteridæ and Trichoceridæ in the present discussion.

PTYCHOPTERIDÆ

PTYCHOPTERA CLITELLARIA sp. nov. Plate 1, fig. 1.

General coloration of thorax yellow, the entire præscutum solidly black, brightened only on the humeral portions; femora yellow, the tips black; wings with a strong brownish yellow tinge, very restrictedly and sparsely patterned with brown; Rs relatively long, about three-fourths the length of R_{4+5} ; basal abdominal tergites yellow, black medially, the outer segments uniformly blackened.

¹ Contribution from the entomological laboratory, Massachusetts State College.

Female.—Length, about 11 millimeters; wing, 11.5.

Rostrum yellow; palpi brown, the terminal segment brownish black. Antenna broken beyond the brown scapal segment. Head black, the front more reddish brown.

Pronotum yellow. Mesonotal præscutum yellow, the entire disk covered by a polished black area, restricting the ground to narrow humeral and anterolateral brightenings; scutum, scutellum, and mediotergite light yellow. Pleura entirely light yellow. Halteres dusky. Legs with the coxæ and trochanters yellow; femora yellow, the tips black, including about the distal eighth; tibiæ dark brown, the tips black; tarsi black (a single leg, middle, remains). Wings (Plate 1, fig. 1) with a strong brownish yellow tinge, cells C and Sc, together with the prearcular field, clearer yellow; very tiny to scarcely evident brown spots along cord and at forks of R_{4+5} and M_{1+2} ; veins dark brown, brighter in the flavous areas. Macrotrichia of cells distributed about as figured (shown by stippled dots). Venation: Rs relatively long, about three-fourths the length of R_{4+5} ; r-m connecting with Rs just before fork; cell M_1 small.

Abdominal tergites one to four yellow laterally, black medially; on outer segments, the entire dorsum black; basal sternites yellow, the outer segments and ovipositor black, only the outer ends of cerci more reddish.

Habitat.—China (Szechwan).

Holotype, female, Yachow, 1930 (*Graham*).

Ptychoptera clitellaria is readily told from all other described species of the genus by the peculiar coloration of the præscutum and abdomen. The family had not been recorded from China.

TRICHOCERIDÆ

TRICHOCERA ARISANENSIS Alexander.

Trichocera arisanensis ALEXANDER, Philip. Journ. Sci. 56 (1935) 339.

Described from the high mountains of Formosa. Mount Omei, Szechwan, altitude 10,800 to 11,000 feet, August 16 to 20, 1934 (*Graham*).

PARACLADURA ELEGANS Brunetti.

Paracladura elegans BRUNETTI, Rec. Indian Mus. 6 (1911) 288.

Described from the eastern Himalayas. Mount Omei, Szechwan, altitude 11,000 feet, August 18, 1934 (*Graham*).

PARACLADURA GRACILIS Brunetti.

Paracladura gracilis BRUNETTI, Rec. Indian Mus. 6 (1911) 287.

Trichocera flava BRUNETTI, Fauna Brit. India, Diptera Nematocera (1912) 512.

Described from the eastern Himalayas. Mount Omei, Szechwan, altitude 11,000 feet, August 18, 1934 (*Graham*).

PARACLADURA OMEIENSIS sp. nov. Plate 1, fig. 2.

General coloration of mesonotum brownish yellow, the præscutum darkened medially; pleura darkened; antennal flagellum black; knobs of halteres dark brown; wings grayish yellow, the veins pale brown; abdominal tergites dark brown.

Female.—Length, about 3.5 to 3.7 millimeters; wing, 3.8 to 4.3.

Rostrum and palpi dark. Antennæ with scape orange-yellow; remainder of antenna black. Head pale brown.

Mesonotum chiefly brownish yellow, the præscutum conspicuously darkened medially; posterior sclerites of mesonotum pale. Pleura rather strongly darkened, paler in one of the paratypes. Halteres dusky, the base of stem yellow, the knob dark brown. Legs with the coxæ and trochanters pale; remainder of legs pale brown, the outer tarsal segments somewhat darker. Wings (Plate 1, fig. 2) uniformly suffused with grayish yellow; stigma lacking; veins pale brown. Venation: M_{3+4} forking at near midlength of cell 1st M_2 ; m-cu on M_4 some distance beyond base.

Abdominal tergites dark brown, the sternites paler. Ovipositor with the cerci broad-based, the distal third strongly narrowed.

Habitat.—China (Szechwan).

Holotype, female, Mount Omei, altitude 11,000 feet, August 18, 1934 (*Graham*). Paratopotype, 1 female, 1 broken, altitude 5,500 to 10,800 feet, August 18, 1934 (*Graham*).

Paracladura omeiensis is readily distinguished from *P. gracilis* Brunetti by the much darker coloration of the body and appendages.

TIPULIDÆ

TIPULINÆ

TIPULA (FORMOTIPULA) UNIRUBRA sp. nov. Plate 1, fig. 3; Plate 2, fig. 25.

Mesonotum black, with three grayish stripes, the median one divided by parallel capillary dark vittæ for about the cephalic

half; scutellum and mediotergite heavily pruinose; legs black; wings with a uniform grayish brown suffusion, cell Sc darker than cell C; Rs exceeding m-cu; abdomen black, the segments pruinose, segment two reddish orange; male hypopygium with the tergite notched medially; dististyle complex, with two blackened spines on posterior margin.

Male.—Length, about 13 millimeters; wing, 15.

Female.—Length, about 13 to 14 millimeters; wing, 15 to 16.

Rostrum and palpi black, sparsely pruinose. Antennæ black, the pedicel a trifle paler; verticils longer than the segments. Head black, sparsely pruinose behind.

Mesonotal præscutum black, with three grayish stripes, the median one divided by parallel capillary black vittæ that occupy about the cephalic half of the sclerite, the stripe being entire behind; scutum, scutellum, and mediotergite obscure, heavily pruinose. Pleura black, more pruinose on ventral sternopleurite. Halteres black. Legs with the coxæ and trochanters dull black; remainder of legs black, the extreme base slightly brightened. Wings (Plate 1, fig. 3) with a uniform grayish brown suffusion; cell Sc distinctly darker than cell C; stigma oval, darker brown; veins brownish black. Venation: Rs longer than usual in the subgenus, exceeding m-cu; R_{1+2} with trichia on basal fifth; m-cu elongate, at fork of M_{3+4} .

Abdomen black, the second tergite reddish orange, the corresponding sternite more obscure brownish red; basal tergite vaguely brightened medially; third and succeeding segments black, sparsely pruinose, without brightening; hypopygium and ovipositor black.

Habitat.—China (Szechwan).

Holotype, male, Mount Omei, altitude 5,500 to 11,000 feet, August 16 to 20, 1934 (*Graham*). Allotopotype, female. Paratopotypes, 2 females.

The nearest ally is apparently *Tipula* (*Formotipula*) *rufizona* Edwards (western China), which has the præscutum with four complete blackish gray stripes and with the orange color of the abdomen including parts of the third and fourth tergites. The present fly is very different from *T. (F.) friedrichi* Alexander and *T. (F.) holoserica* Matsumura in the notched ninth tergite of the male hypopygium.

NEPHROTOMA BIARMIGERA sp. nov. Plate 1, fig. 4; Plate 2, fig. 26.

General coloration yellow; occipital brand not or scarcely indicated; præscutum with three polished black stripes; scutellum

yellow; mediotergite yellow, the posterior border a little more reddish; pleura yellow, variegated by more reddish areas; halteres pale yellow; femora yellow, the tips not or scarcely darkened; wings with a pale yellow suffusion; abdomen yellow, the tergites trivittate with black, the median stripe broad but interrupted; subterminal segments black; male hypopygium with a heavily blackened, slightly bifid lobe from the ventromesal portion of basistyle.

Male.—Length, 11 to 12 millimeters; wing, 12 to 13.

Female.—Length, about 15 millimeters; wing, 13.5.

Frontal prolongation of head yellow; outer half of dorsal surface, including nasus, darkened; palpi chiefly pale. Antennæ with the scape light yellow; pedicel pale brown; flagellar segments brownish black, relatively elongate and moderately incised; verticils shorter than the segments. Head with the vertical tubercle yellow, darker posteriorly; remainder of head more orange-yellow; occipital brand not or scarcely indicated.

Pronotum and pleura orange-yellow. Mesonotal præscutum light yellow, with three polished black stripes that are very narrowly bordered by more velvety black; lateral stripes weakly outcurved with velvety black; in female, median stripe with cephalic half narrowly divided by more reddish brown; scutum yellow, each lobe chiefly polished black, narrowly bordered by more velvety black; scutellum yellow; mediotergite light yellow, the posterior border with more reddish, paired areas. Pleura yellow, variegated by more reddish areas on anepisternum, ventral sternopleurite, meron, and posterior portions of pleurotergite. Halteres pale yellow, the base of each knob weakly darkened. Legs with the coxæ and trochanters yellow; femora yellow, the tips not or scarcely darkened; tibiæ and basitarsi brownish yellow, the tips of the latter, together with remainder of tarsi, black. Wings (Plate 1, fig. 4) with a pale yellow suffusion; stigma medium brown; a very vague and restricted dark cloud on anterior cord; veins brown, paler in prearcular field. Venation: Sc_2 ending just beyond origin of Rs; cell M_1 very short-petiolate to narrowly sessile; M_4 departing shortly before fork of M_3 , m-cu on base of former.

Abdomen yellow, the tergites trivittate with black, the areas interrupted at the bases of the segments; median stripe broad and conspicuous, beginning on the first tergite; segments seven and eight, and the central portion of tergite nine black, the remainder of hypopygium pale. In female the tergal areas more

expanded on posterior portion of segments to form triangles. Male hypopygium with the caudal border of tergite (Plate 2, fig. 26, 9*t*) almost evenly, convexly rounded, without projecting horns or lobes. Outer dististyle, *od*, not markedly attenuate at apex. Inner dististyle, *id*, broad, with two blackened lobes, additional to the slender beak; surface with conspicuous setæ. Basistyle at ventromesal portion produced into a blackened lobe, *b*, the apex slightly bifid, the surface microscopically corrugated. A pale membranous median lobe, directed cephalad, from outer portion of eighth sternite.

Habitat.—China (Chekiang).

Holotype, male, hills south of Ning-po, halfway to Nimrod Sound, May 1, 1925 (*Suenson*). Allotopotype, female. Paratopotype, male.

Nephrotoma biarmigera is most generally similar to species such as *N. citrina* Edwards and *N. nigricauda* Alexander, differing from both in the coloration. The peculiar blackened lobe on the basistyle of the male hypopygium is very different from the condition in any other regional *Nephrotoma* that I have examined.

NEPHROTOMA EVITTATA sp. nov. Plate 1, fig. 5; Plate 2, fig. 27.

Allied to *impigra*; general coloration yellow; frontal prolongation of head yellow, unmarked; palpi pale yellow; flagellar segments (male) strongly incised; occipital brand undifferentiated; mesonotal præscutum with three polished black stripes; mediotergite yellow; wings whitish subhyaline, cell Sc uniformly dark brown; stigma pale brownish yellow; abdomen orange, without a median tergal stripe but with pale brown areas on sides of tergites two to five, inclusive; hypopygium pale; male hypopygium with the eighth sternite very weakly emarginate, with a small rounded cushion in the notch, the setæ surrounding the emargination unusually sparse and not of unusual length.

Male.—Length, about 8.5 millimeters; wing, 9.

Frontal prolongation of head yellow, the dorsal surface and nasus not or scarcely darkened; setæ of nasus black; palpi pale yellow throughout. Antennæ with basal three segments yellow, the remainder of flagellum black; antenna relatively long, if bent backward extending approximately to base of abdomen; flagellar segments rather strongly incised; verticils shorter than

the segments. Head orange, the occipital band not differentiated; posterior genæ a little paler.

Pronotum yellow throughout. Mesonotal præscutum yellow, with three polished black stripes, each of the lateral pair with a much paler brown spot outside its anterior end; scutum yellow, the lobes extensively blackened, the color involving the outer end of the suture and the adjoining lateral portion of the scutal lobe as a velvety-black U-shaped line; scutellum weakly infumed, the parascutella yellow; mediotergite yellow, the posterior border vaguely more reddish yellow. Pleura light yellow, with very vague, more reddish areas on anepisternum, ventral sternopleurite, ventral meron, and posterior portion of pleurotergite. Halteres pale brown, the apices of knobs light yellow. Legs with the coxæ and trochanters yellow; femora yellow, the extreme tips darkened; tibiæ yellow, the outer ends passing into black; tarsi broken. Wings (Plate 1, fig. 5) whitish subhyaline; cell Sc uniformly dark brown; stigma pale brownish yellow; veins dark brown. Venation: Sc₂ ending just beyond origin of Rs, Sc₁ preserved; cell M₁ very short-petiolate; M₄ departing a short distance before M₃; m-cu on M₄ just beyond its base.

Abdomen entirely orange, without indications of a median dark tergal stripe but with pale brown lateral areas on tergites two to five, inclusive; hypopygium entirely pale. Male hypopygium with the tergite (Plate 2, fig. 27, 9t) bearing two slender acute lateral spines, each with about three blackened denticles near base. Outer dististyle, *od*, pale throughout, not greatly attenuated, the setæ relatively sparse and inconspicuous. Inner dististyle, *id*, relatively slender, the apical beak long and narrow. Eighth sternite, 8s, with a very small median notch that bears a tiny rounded cushion set with abundant microscopic setulæ; setæ of sternite surrounding this emargination very sparse and of ordinary length.

Habitat.—China (Szechwan).

Holotype, male, Shin-Kai-Si, Mount Omei, altitude 4,400 feet (*Graham*).

The present fly is allied to *Nephrotoma impigra* Alexander (western China), differing notably in the coloration of the body, as the lack of a dark median stripe on the abdominal tergites. The details of the male hypopygium are distinctive.

NEPHROTOMA DEFINITA sp. nov. Plate 2, fig. 28.

General coloration yellow; antennal scape and pedicel yellow, flagellum black; head orange, the occipital brand small and inconspicuous, reddish brown; mesonotal præscutum yellow, with three piceous-black stripes, the anterior half of the median stripe paling to reddish brown; posterior half of mediotergite darkened; knobs of halteres yellow; femora yellow, the extreme tips dark brown; wings whitish, stigma and cell Sc darkened; abdomen orange, the median region of tergite two and base of sternite eight blackened; hypopygium orange; eighth sternite long and sheathing, the caudal margin unmodified.

Male.—Length, about 12 millimeters; wing, 10.5.

Female.—Length, about 18 millimeters; wing, 13.

Frontal prolongation of head yellow, more reddish above; nasus pale; palpi with the basal two segments slightly darkened, the outer segments yellow. Antennæ with scape and pedicel yellow, the flagellum black; flagellar segments very weakly incised. Head orange, the vertical tubercle more yellowish; occipital brand small and inconspicuous, reddish brown; in female, with a narrow dark vitta to summit of vertical tubercle.

Pronotum yellow medially, darkened laterally. Mesonotal præscutum yellow, with three polished piceous-black stripes, the anterior half of the median stripe paling to reddish brown; lateral stripes straight; scutum yellow, each lobe with two black areas; central portion of suture blackened, sending a short median line caudad onto the scutum to form a Y-shaped figure; a narrow black streak before wing root; scutellum brown, parascutella yellow; mediotergite yellow, with nearly the posterior half occupied by a transverse-oval dark area. Pleura yellow, variegated by dark reddish on propleura, anepisternum, ventral sternopleurite, and meron; dorsal and ventral pleurotergite similarly colored. Halteres dark, the base of stem restrictedly pale, the knob chiefly yellow. Legs with the coxæ and trochanters reddish yellow; femora yellow, the extreme tips narrowly but conspicuously dark brown; tibiæ yellow, the tips narrowly darker; tarsi passing into black. Wings whitish; stigma, cell Sc, and the narrow cell Cu_1 dark brown; veins brown. Stigma with a few trichia. Venation: Sc_1 preserved; Rs short; M_4 arising at the same point as M_3 ; cell M_1 sessile.

Abdomen orange, the median region of tergite two and base of sternite eight blackened; hypopygium orange, reduced in size. In female the tergal darkened areas a little more extensive.

Male hypopygium with the tergite (Plate 2, fig. 28, 9t) produced into two lateral horns that merge into the thickened caudal margin, densely set with spines and stout setæ. Outer dististyle, *od*, relatively small, pale throughout, including the setæ. Inner dististyle, *id*, relatively narrow, the outer border unmodified. Ninth sternite reduced in area. Eighth sternite long and sheathing, the caudal margin unmodified.

Habitat.—Formosa.

Holotype, male, Sumaän, altitude 2,500 feet, August 21, 1921 (*Esaki*). Allotopotype, female, returned to Professor Esaki.

The coloration of the præscutum is somewhat as in the much smaller and otherwise very distinct *Nephrotoma parva* (Edwards).

NEPHROTOMA CAUDIFERA sp. nov. Plate 1, fig. 6; Plate 2, figs. 29, 30.

General coloration yellow; mesonotal præscutum with three polished black stripes, each of the lateral pair with a velvety-black spot at its anterior end; head orange throughout, with no occipital brand; halteres dusky throughout; wings with a brownish tinge, the stigma not or scarcely darker; about a dozen stigmal trichia in cell R_1 ; abdomen orange-yellow, the seventh and eighth tergites weakly darkened; inner dististyle of hypopygium with a long, pale, tail-like extension behind; ninth sternite with a large, median, cushionlike lobe.

Male.—Length, about 10 millimeters; wing, 10.5.

Frontal prolongation of head yellow, the dorsum, including nasus, darkened; palpi dark brown. Antennæ of moderate length, if bent backward extending to shortly beyond wing root; scape orange-yellow; pedicel reddish brown; flagellum black; flagellar segments moderately incised; verticils shorter than the segments. Head orange throughout; no occipital brand.

Pronotum entirely yellow. Mesonotal præscutum yellow, with three polished black stripes, each of the lateral pair with a velvety-black outward extension opposite its anterior end; scutum yellow, the lobes chiefly polished black, the outer ends of suture restrictedly velvety black; scutellum brown, parascutella yellow; mediotergite yellow, without evident darkenings. Pleura yellow, the ventral sternopleurite a little more reddish. Halteres dusky throughout. Legs with the coxæ and trochanters yellow; femora obscure yellow; tibiæ dark brown; tarsi black. Wings (Plate 1, fig. 6) with a brown tinge, the stigma not or scarcely darker, with about a dozen trichia in cell R_1 ; prearcular region a trifle more yellowish; veins dark brown. Vena-

tion: Sc_2 ending opposite origin of Rs , Sc_1 represented by a slight spur; cell M_1 narrowly sessile; M_4 a short distance before fork of M_3 , with $m-cu$ shortly beyond base of M_4 ; cell 2d A relatively narrow.

Abdomen orange-yellow, very indistinctly marked with darker, only the seventh and eighth tergites weakly infumed. Male hypopygium with the ninth tergite (Plate 2, fig. 29, 9t) having the lateral spines, as viewed from above, slender, with two teeth near base; intermediate lobes with abundant spines. Outer dististyle (Plate 2, fig. 30, od) relatively broad across basal half, the apex slightly attenuated. Inner dististyle, *id*, very high, with a long, pale, caudal extension. Ninth sternite with a large, protuberant, median cushion. Eighth sternite with the posterior margin transverse, unmodified.

Habitat.—Formosa.

Holotype, male, Hassensan, altitude 5,500 feet, July 7, 1934 (Gressitt).

Nephrotoma caudifera is somewhat similar to species such as *N. flammeola* Alexander and *N. subpallida* Alexander, of Japan, but is very distinct in the details of coloration and structure of the male hypopygium, notably the inner dististyle.

NEPHROTOMA NIGROSTYLATA sp. nov. Plate 1, fig. 7; Plate 2, fig. 31.

General coloration yellow; præscutum with three polished black stripes, each of the lateral pair with a velvety-black spot opposite its anterior end; antennæ (male) relatively long; occiput and vertex with a linear black vitta almost to summit of vertical tubercle; mediotergite yellow, the posterior border darkened; abdomen yellow, the tergites with three black stripes, the sternites with a median, interrupted black stripe; hypopygium black, including the styli; margin of outer dististyle provided with weak denticles; eighth sternite with a tonguelike, median, yellow lobe.

Male.—Length, 10 millimeters; wing, 9.5; antenna, about 4.

Female.—Length, 11 to 12 millimeters; wing, 11 to 11.5.

Frontal prolongation of head polished yellow, the dorsal surface more darkened, the color involving the nasus; palpi black. Antennæ (male) relatively elongate, if bent backward extending to shortly beyond the base of abdomen; basal three segments yellow, the flagellum very weakly bicolorous; basal enlargements of the segments black, the remainder dark brown; flagellar seg-

ments not or scarcely incised; verticils shorter than the segments. Head orange, the occipital band appearing as a narrow brownish black line that extends cephalad almost to summit of vertical tubercle.

Pronotum obscure yellow, narrowly blackened laterally. Mesonotal præscutum yellow, with three polished black stripes that are not bordered; a velvety-black spot opposite the anterior end of the lateral stripes; scutal lobes very extensively blackened, attaining the suture, the lateral ends of the latter more velvety black; scutellum brownish black medially, the parascutella somewhat paler; mediotergite yellow, the posterior border darkened. Pleura yellowish white, more reddish on the ventral anepisternum, ventral sternopleurite, meron, and posterior portion of pleurotergite. Halteres dusky, the tips of the knobs obscure yellow. Legs with the coxæ and trochanters yellow, the posterior coxæ a little darkened basally; femora and tibiæ yellow, the tips very narrowly darkened; tarsi brown basally, passing into black. Wings (Plate 1, fig. 7) with a faint yellow tinge; prearcular region and cells C and Sc clearer yellow; stigma oval, brown; wing tip vaguely but rather evidently darkened; a very narrow seam on anterior cord; veins brown, more flavous in the yellow regions. Venation: Sc₂ extending a short distance beyond origin of Rs, Sc₁ weakly preserved; Rs shorter than R₂₊₃; cell M₁ with a short to longer petiole; m-cu shortly before M₄, the latter a corresponding distance before the point of departure of M₃.

Abdomen yellow, the tergites narrowly but conspicuously trivittate with black, the median stripe broader, especially behind, the dark color narrowly interrupted at the bases of the segments; sternites yellow, with a narrow, interrupted, black, median stripe; eighth and ninth segments entirely blackened, including the styli but not the appendage of the eighth sternite. Male hypopygium with the caudal margin of the ninth tergite (Plate 2, fig. 31, 9t) produced into lateral flattened black lobes, their mesal edges coarsely toothed. Outer dististyle, *od*, slender, blackened, slightly narrowed outwardly, the tip curved and subacute, the margin of style with three or four weak denticles. Inner dististyle, *id*, of peculiar shape, as figured, black throughout; posterior margin with abundant, long, pale setæ. Eighth sternite with a median, yellow, elongate-triangular, tonguelike lobe, its surface microscopically pubescent.

Habitat.—China (Szechwan).

Holotype, male, Chungking, altitude 1,000 to 2,000 feet, May 6 to 27, 1930 (*Graham*). Allotopotype, female. Paratopotypes, 12 of both sexes.

Nephrotoma nigrostylata is very different from all other described regional species. The tonguelike lobe on the eighth sternite is somewhat like that in *N. ligulata* Alexander and *N. parvirostra* Alexander, but in all other regards the present fly is very distinct.

CYLINDROTOMINÆ

PHALACROCERA MINUTICORNIS sp. nov. Plate 1, fig. 8.

General coloration yellow, the vertex black; antennæ of both sexes unusually small, with long conspicuous verticils; mesonotal præscutum with four polished black stripes, the intermediate pair almost confluent; halteres elongate, brownish black; wings long and narrow, with a strong, almost uniform, brown tinge; R_{1+2} entirely atrophied; m-cu beyond fork of M; cell 2d A unusually narrow.

Male.—Length, about 10 millimeters; wing, 9.8.

Female.—Length, about 10 millimeters; wing, 10.

Rostrum very small, brown; palpi black. Antennæ very small and subequal in both sexes, if bent backward ending some distance before wing root; scape yellow, pedicel and flagellum dark brown; flagellar segments subcylindrical to cylindrical, with long conspicuous verticils that are much longer than the segments. Head yellow on front and occiput, the vertex polished black, the posterior orbits narrowly pale.

Pronotum yellow. Mesonotal præscutum yellow, with four polished black stripes, the intermediate pair closely approximated, being separated only by a very vague capillary vitta; scutum pale, the lobes with black centers, the median pale area very broad; scutellum and mediotergite obscure yellow. Pleura yellow. Halteres elongate, brownish black, the base of stem narrowly yellow. Legs with the coxæ and trochanters yellow; femora obscure yellow, brighter at base, the tip passing into brownish black; tibiæ and tarsi black. Wings (Plate 1, fig. 8) long and narrow, with a strong and almost uniform brown tinge, the long-oval stigma slightly darker brown; veins dark brown. Venation: Sc_1 lacking; free tip of Sc_2 present but faint; R_{1+2} entirely atrophied; m-cu variable in position, from more than one-half to nearly its own length beyond fork of M; cell 2d A unusually narrow, with a distinct fold behind the vein.

Abdomen with the basal segments obscure brownish yellow, the outer segments and hypopygium black.

Habitat.—China (Szechwan).

Holotype, male, Mount Omei, altitude 11,000 feet, August 18, 1934 (*Graham*). Allotopotype, female.

Phalacroceræ minuticornis is allied to the Japanese and Formosan species, *P. formosæ* Alexander, *P. megacauda* Alexander, and *P. mikado* Alexander, differing in the narrow, strongly suffused wings, with very narrow cell 2d A, and in the unusually small antennæ in both sexes.

LIMONIINÆ

LIMONIINI

LIMONIA (LIMONIA) PRUDENTIA sp. nov. Plate 1, fig. 9; Plate 3, fig. 32.

General coloration of mesonotal præscutum reddish brown, with three brownish black stripes; antennal flagellum black; femora black, with a conspicuous yellow subapical ring; wings light yellow, heavily patterned with brown, including longitudinal seams and streaks; a darker brown area at fork of Sc; Sc long, Sc₂ at tip of Sc₁; R₁₊₂ subequal to Sc₂ + R₁; m-cu about one-half its length before fork of M; male hypopygium with the ninth tergite deeply emarginate; dististyle small, the basal half globular.

Male.—Length, about 9 millimeters; wing, 11.

Rostrum and palpi black, the former moderately long, exceeding one-half the length of head. Antennæ black, the pedicel a little paler, more yellowish brown; flagellum moderately elongate; segments with weak basal enlargements; longest verticils a little exceeding the segments. Head black; anterior vertex narrow.

Pronotum brownish black. Mesonotal præscutum reddish brown, with three brownish black stripes, the median stripe paling into the ground color on anterior portion; humeral and outer marginal portions of præscutum narrowly blackened; scutal lobes blackened, the median area pale; scutellum and mediotergite chiefly blackened, the latter paler on sides. Pleura chiefly blackened on dorsal portions, including the dorsopleural membrane, the ventral sternopleurite paler. Halteres with base of stem and apex of knob more yellowish. Legs with the fore and middle coxæ brownish black, the posterior coxæ paler; trochanters obscure yellow; femora yellow basally, soon passing into black, with a broad, light yellow, subterminal ring that is some-

what wider than the black apex; tibiæ brownish yellow, the tips narrowly blackened; tarsi black, the proximal ends of basitarsi restrictedly pale; legs relatively long and slender; claws (male) with three or four teeth on basal half. Wings (Plate 1, fig. 9) light yellow, heavily patterned with brown, including seams to the veins and longitudinal streaks in the centers of the cells, the dark color somewhat more extensive than the ground; a small, darker brown spot at fork of Sc; stigma not darker than the remaining pattern of the wings; the pale ground color includes an oblique crossband beyond cord, extending from costa into cell M_4 , interrupted only by very narrow seams to the longitudinal veins; cell 2d A darkened except at outer end; veins yellowish brown. Venation: Sc long, Sc_1 ending shortly before fork of Rs, Sc_2 at its tip; Rs long; R_{1+2} subequal to $Sc_2 + R_1$ and R_{2+3} ; m-cu about one-half its length before fork of M.

Abdomen brownish black, the styli of the hypopygium more yellow. Male hypopygium (Plate 3, fig. 32) with the tergite, $9t$, broad basally, strongly narrowed outwardly, the caudal margin with a deep rounded emargination, the lateral lobes formed very narrow. A single dististyle, d , this relatively small and globular on basal half, the outer portion or beak stout, with numerous small setæ but without spines. \AA edeagus, a , broad.

Habitat.—China (Szechwan).

Holotype, a broken male, Mount Omei, altitude 11,000 feet, August 18, 1934 (*Graham*).

The nearest allies of the present fly seem to be *Limonia* (*Limonia*) *kashmirica* Edwards and *L. (L.) synempora* Alexander, which differ conspicuously in the body coloration, venation, especially of the medial field, and in the details of the hypopygium.

LIMONIA (DICRANOMYIA) VETERNOSA sp. nov. Plate 1, fig. 10; Plate 3, fig. 33.

General coloration of thorax yellow, with a dark brown median stripe on pronotum and præscutum; antennæ black throughout; halteres dark brown; wings whitish subhyaline; stigma relatively small, ill-delimited, dark brown; Sc_1 long; abdominal tergites and hypopygium brownish black, the basal sternites yellow; male hypopygium with the basistyle and ventral dististyle complicated by outgrowths.

Male.—Length, 6.5 to 7 millimeters; wing, 7 to 7.5.

Female.—Length, 8 to 9 millimeters; wing, 8 to 8.5.

Rostrum dark brown; palpi black. Antennæ black throughout; flagellar segments long-oval. Head yellowish gray.

Pronotum dark brown above, the sides yellow pollinose. Mesonotal præscutum yellow pollinose, with a conspicuous, dark brown, median stripe extending from the pronotum, as described, becoming obsolete before the suture; scutum and scutellum pale, the mediotergite more darkened. Pleura and pleurotergite yellow pollinose. Halteres dark brown, the base of stem yellow. Legs with the coxæ and trochanters yellow; femora yellow basally, the remainder brown with the tips rather narrowly black, the fore femora more uniformly blackened; tibiæ and tarsi blackened, in cases the former somewhat paler in central portions. Wings (Plate 1, fig. 10) whitish subhyaline; stigma relatively small and ill-delimited, dark brown; veins dark brown. Venation: Sc_1 ending opposite origin of R_s , Sc_2 some distance from its tip, Sc_1 alone subequal to or only a little shorter than R_s ; cell 1st M_2 closed; m-cu just before the fork of M , more rarely at the fork.

Abdomen relatively long; tergites, including hypopygium, brownish black; basal sternites yellow, the outer segments black. Male hypopygium (Plate 3, fig. 33) with the tergite, $9t$, transverse, the caudal margin gently emarginate. Basistyle, b , with the usual ventromesal lobe complex, produced into a large flattened structure, at its base with a smaller lobe that is tipped with several fasciculate setæ. Dorsal dististyle a slender, relatively straight rod; in most specimens longer and more slender than in the paratype figured. Ventral dististyle, vd , of moderate size, the rostral prolongation very stout at base; on outer margin before the spines with a small tubercle that is tipped with three or four strong spines, directed outward; rostral spines long and slender, very slightly unequal in length, arising from a low common tubercle; cephalic portion of style near base of prolongation with a group of long setæ. Gonapophyses, g , with mesal-apical lobe slender.

Habitat.—China (Szechwan).

Holotype, male, Mount Omei, altitude 11,000 feet, August 18, 1934 (*Graham*). Allotopotype, female. Paratopotypes, several males and females with the types; others at 5,500 to 11,000 feet, August 16 to 20, 1934 (*Graham*).

Limonia (*Dicranomyia*) *veternosa* is very distinct from the other described regional species of the subgenus having complex outgrowths of the basistyle and ventral dististyle of the male hypopygium. The group of setæ on the ventral dististyle

near base is suggestive of the otherwise very different *L. (D.) basiseta* (Alexander), of Japan.

LIMONIA (RHIPIDIA) MONOCTENIA sp. nov. Plate 1, fig. 11; Plate 3, fig. 34.

Belongs to the *uniseriata* group; mesonotal præscutum with three more or less confluent brown stripes, the interspaces golden pollinose; pleura with a black longitudinal stripe; antennæ (male) with eight unipectinate flagellar segments; halteres yellow; femora with the tips black, on the forelegs very broad; wings dark brown, with four very extensive darker brown costal blotches, the remainder of wing disk with small scattered white areas; Sc₁ ending at near one-third the length of Rs, Sc₂ at its tip; a supernumerary crossvein in cell Sc; m-cu before fork of M; abdominal tergites brownish black; male hypopygium with the rostral prolongation bearing either two or three flattened spines, placed close together at near midlength of the prolongation.

Male.—Length, about 5.5 millimeters; wing, 6.6.

Rostrum and palpi black. Antennæ black, the apical pedicels of the flagellar segments pale; flagellar segments conspicuously unipectinate; longest branches a little shorter than the segments that bear them; basal flagellar segment stout but not distinctly pectinate; flagellar segments two to nine, inclusive, with distinct branches; segments ten and eleven enlarged but not pectinate; terminal segment elongate, exceeding the penultimate. Head brownish gray, the front brighter; anterior vertex narrow, less than the diameter of scape.

Pronotum dark brown. Mesonotal præscutum with three more or less confluent brown stripes, the posterior interspaces and lateral margins golden pollinose, the lateral stripes confluent with the median stripe at anterior ends; posterior sclerites of notum dark brown, the scutellum more pruinose. Pleura brown ventrally, with a conspicuous black longitudinal stripe extending from the cervical region to the base of abdomen, passing beneath the wing root. Halteres pale yellow. Legs with the coxæ brown, the fore coxæ more darkened basally; trochanters light brown; femora yellow basally, the tips black, more extensive on the forelegs where only the bases are narrowly brightened, much narrower on posterior legs, involving only the distal fourth or fifth; tibiæ black; tarsi black, including the posterior pair, much shorter than the tibiæ; claws toothed. Wings (Plate 1, fig. 11) with the ground color rather dark brown, including four even darker costal areas, these much more extensive than the

interspaces; third dark blotch at origin of Rs; remainder of wing membrane variegated by scattered small whitish areas; veins brownish black, the trichia conspicuous. Venation: Sc₁ ending about opposite one-third the length of Rs, Sc₂ at its tip; a supernumerary crossvein in cell Sc at near two-thirds the length of the cell; free tips of Sc₂ and R₂ both pale, in transverse alignment; m-cu shortly before fork of M; anal veins at origin nearly parallel.

Abdominal tergites brownish black, the basal sternites brighter; ventral lobes of dististyles pale. Male hypopygium (Plate 3, fig. 34) with the caudal border of tergite, 9*t*, rather deeply emarginate. Ventral dististyle, *vd*, fleshy, the rostral prolongation relatively long, flattened, bearing two or three spines at near midlength (in the unique type there are three spines on the left style, two on the right); spines sessile, strongly flattened, gently curved, subequal to or shorter than the apex of the prolongation beyond the outermost. Dorsal dististyle suddenly narrowed at apex into a straight spine. Gonapophyses, *g*, with the mesal-apical lobe a straight black point.

Habitat.—China (Szechwan).

Holotype, male, Mount Omei, altitude 10,800 feet, August 18, 1934 (*Graham*).

Limonia (Rhipidia) monoctenia is very different from all other regional species of the subgenus in the unipectinate antennæ and pattern of the wings. The only regional member of the group heretofore made known is *L. (R.) siberica* (Alexander), which has the wing entirely different both in pattern and venation.

ANTOCHA (ANTOCHA) LACTEIBASIS sp. nov. Plate 1, fig. 12; Plate 3, fig. 35.

General coloration of præscutum brownish ochereous, with a median brown stripe; antennæ black throughout; knobs of halteres darkened; legs brown, the terminal tarsal segments passing into black; wings tinged with gray, the prearcular region clear creamy yellow; veins dark brown, very distinct; R₂ and r-m in transverse alignment, both lying far distad, r-m being about one-half the basal section of vein R₄₊₅, cell 1st M₂ about as long as vein M₁₊₂ beyond it; m-cu before fork of M; male hypopygium with both dististyles long and slender; outer gonapophyses short, obtuse at tips.

Male.—Length, about 5.5 millimeters; wing, 6.5.

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

Rostrum brownish yellow; palpi black. Antennæ black throughout; flagellar segments oval. Head uniformly gray.

Mesonotal præscutum brownish ochereous, with a median brown stripe that is very diffuse, the humeral region brightest; posterior sclerites of mesonotum chiefly dark brown, pruinose. Pleura brownish ochereous, more darkened on the sternopleurite and pleurotergite. Halteres dusky, the knobs darkened. Legs with the forecoxæ darkened, the remaining coxæ and all trochanters pale; remainder of legs brown, the terminal tarsal segments passing into black. Wings (Plate 1, fig. 12) tinged with gray, the prearcular region clear creamy yellow; stigma elongate-oval, darker brown than the ground; veins dark brown, very distinct. Venation: R_2 and r-m in transverse alignment; inner end of cell 1st M_2 somewhat arcuated; basal section of M_3 longer than m; m-cu about one-third its length before the fork of M.

Abdomen dark brown, the hypopygium very little brighter. Male hypopygium (Plate 3, fig. 35) with the tergite, 9t, narrowly transverse, the caudal margin straight or very slightly produced at near midlength; dorsal surface of sclerite with a transverse discal grouping of setæ. Outer dististyle elongate, slender, gradually narrowed to the acute tip. Inner dististyle subequal in length and nearly as slender, narrowed to the obtuse tip, the surface with abundant setæ. Gonapophyses with the inner pair slender, subtending the ædeagus, each with a second more slender spine nearer base. Outer gonapophyses much shorter, at apex a little dilated into an obtusely rounded, flattened head.

Habitat.—China (Szechwan).

Holotype, male, Mount Omei, altitude 5,500 to 11,000 feet, August 16 to 20, 1934 (*Graham*). Allotopotype, female. Paratopotypes, 1 male, 1 female, altitude 10,800 to 11,000 feet, August 18, 1934 (*Graham*).

The only regional species that is at all similar to the present fly is *Antocha* (*Antocha*) *setigera* Alexander, which has the male hypopygium entirely different in structure.

HEXATOMINI

HEXATOMA (ERIOCERA) ISHIGAKIENSIS sp. nov. Plate 1, fig. 13.

Belongs to the *mesopyrrha* group; head black; mesonotum dull brown, the præscutum with four more reddish brown stripes; legs yellow, the tips of femora, tibiæ, and basal two tarsal segments narrowly blackened; remaining tarsal segments black; wings on costal third intense orange-yellow, the remaining cells weakly infumed, the veins narrowly bordered by yellow; vein Sc_1 angulated and spurred at tip; cell M_1 present; abdomen black, the shield of ovipositor fiery orange.

Female.—Length, about 20 millimeters; wing, 14.5.

Rostrum and palpi black. Antennæ with the scape black; pedicel dark brown; flagellum yellow, the outer segments somewhat darker. Head brownish black.

Mesonotal præscutum dark chocolate-brown, with four more reddish brown, dull stripes, the intermediate pair separated by a capillary pale line and further delimited on their mesal edges by a narrow brown line; scutum reddish; scutellum at base reddish brown, the outer portion more brownish black and pruinose; mediotergite dark brown, with a pale area at each outer posterior corner. Pleura dark reddish brown, including the dorsopleural membrane. Halteres blackened, the base of stem restrictedly pale. Legs with the coxæ and trochanters reddish brown; femora and tibiæ yellow, the tips narrowly but conspicuously blackened; basal two segments of tarsi yellow, the tips narrowly blackened; outer tarsal segments uniformly black. Wings (Plate 1, fig. 13) intense orange-yellow on about the costal third; centers of cells on remainder of wing weakly darkened but veins narrowly bordered by yellow; anal cells and weak streaks in centers of several other cells slightly paler; veins yellow. Macrotrichia of radial veins abundant, of medial veins lacking or virtually so; costa with abundant setæ (female). Venation: Tip of Sc_1 angularly bent into costa, with a spur at the angulation; R_{1+2} about one-half longer than R_{2+3} ; cell M_1 present; m-cu before midlength of cell 1st M_2 .

Abdomen black, the surface polished, the posterior margins of the segments more opaque velvety. Shield of ovipositor and preceding segment fiery orange; cerci elongate, brownish black on basal half, the outer portion horn yellow.

Habitat.—Japan (Loochoo Islands).

Holotype, female, Ishigaki Island, August 27, 1934 (*Gressitt*).

The present fly is most nearly allied to species such as *Hexatoma (Eriocera) cæsarea* (Alexander) and *H. (E.) kelloggi* (Alexander), differing especially in the coloration of the legs and wings. It is now becoming apparent that the males in the species of the so-called *mesopyrrha* group have the costa with very few setæ, whereas in the associated females these are much more numerous and evenly distributed.

HEXATOMA (ERIOCERA) IRIOMOTENSIS sp. nov. Plate 1, fig. 14.

General coloration black, the præscutum with three more-polished black stripes; halteres black; legs yellow, the tips of the

femora and tibiæ narrowly blackened; wings orange-yellow, variegated by dark brown, chiefly as conspicuous seams to the veins, the pattern much as in *sauteriana*; abdomen black, the tergites polished, with velvety-black margins; hypopygium black; shield of ovipositor reddish.

Male.—Length, 11 to 12 millimeters; wing, 8.5 to 10.

Female.—Length, about 21 millimeters; wing, 14.

Rostrum and palpi black. Antennæ with scape and pedicel black; flagellum pale brown; antennæ of male 8-segmented, the flagellar segments gradually decreasing in length to the end. Head velvety black, the vertex and vertical tubercle a little more plumbeous.

Mesonotal præscutum velvety black with three more-polished black to somewhat plumbeous stripes; scutum black, the centers of the lobes more polished; posterior sclerites of notum black. Pleura, including the dorsopleural region, black. Halteres black, the stem a very little paler. Legs with the coxæ and trochanters black; femora yellow, the tips very narrowly black, the amount subequal on all legs; tibiæ yellow, the tips narrowly darkened; basitarsus obscure yellow at proximal end, passing into brown; outer tarsal segments black. Wings (Plate 1, fig. 14) with the ground color deep orange-yellow, conspicuously patterned with dark brown; the dark color appears as relatively narrow seams to the veins beyond the cord, basad of cord forming an oblique cross area in cells R_1 , R and M connected with seams along the veins and cord to inclose a large area of the ground in outer ends of cells R and M; cells C and Sc of the ground color; cells Cu and the anals almost uniformly darker, the former invaded near outer end; entire wing apex narrowly margined with dark; veins dark, paler in the flavous portions. Macrotrichia of veins abundant, especially beyond cord. Venation: Sc_2 some distance before tip of Sc_1 , just beyond fork of Rs; R_{1+2} about one-half longer than R_{2+3} ; m-cu at near midlength of cell 1st M_2 ; cell M_1 lacking. In the paratype, the right wing shows a curious venational malformation, the basal section of M_{1+2} being misplaced and lying distad of the level of m-cu, thus greatly restricting the area of cell 1st M_2 .

Abdomen of male black, with alternate polished and velvety rings; all but distal fourth of each segment polished, more or less nacreous, the apex velvety black; on the outer sternites, the velvety coloration becomes more extensive, involving one-half or more of the segments; hypopygium black. In the female, the

abdomen is more extensively polished black, the genital shield and valves reddish horn-colored.

Habitat.—Japan (Loochoo Islands).

Holotype, male, Iriomote Island, August 20, 1934 (*Gressitt*). Allotopotype, female, August 25, 1934. Paratopotype, male, August 23, 1934.

This beautiful fly is most nearly allied to the Formosan *Hexatoma (Eriocera) sauteriana* (Enderlein), which differs conspicuously in the black legs, darkened costal border of wings, and black shield of the ovipositor.

ERIOPTERINI

NEOLIMNOPHILA PERREDUCTA sp. nov. Plate 1, fig. 15.

Mesonotal præscutum gray, with four brown stripes, the intermediate pair darker than the lateral ones; trochanters brownish yellow; wings white, heavily patterned with dark brown; R_2 far before fork of R_{3+4} , the latter vein subequal to vein R_3 ; cell M_1 small; m-cu close to proximal end of cell 1st M_2 .

Female.—Length, 7 to 7.5 millimeters; wing, 7.5 to 8.

Rostrum and palpi black. Antennæ black throughout; fusion segment involving four segments. Head brownish gray.

Mesonotal præscutum gray, with four brown stripes, the intermediate pair more intense, separated by a line of the ground color that is about one-half as wide as either stripe; lateral stripes paler; posterior sclerites of mesonotum gray, the centers of the scutal lobes a little darker. Pleura gray. Halteres pale yellow throughout. Legs with the coxæ dark, pruinose; trochanters brownish yellow; remainder of legs black, the femora brightened at extreme base. Wings (Plate 1, fig. 15) white, the prearcular field more cream-colored; cells C and Sc pale brownish yellow; a heavy brown pattern, including the origin of R_s , anterior cord and stigmal area, together with conspicuous seams on certain of the longitudinal veins, including R_5 , M_3 , Cu_1 , and 2d A; veins pale, darker in the infuscated areas. Venation: cell R_3 very small, with R_2 far before fork of R_{3+4} , the latter vein subequal to R_3 alone; r-m more than one-half its length before fork of R_s ; cell M_1 small; cell 1st M_2 elongate, with m-cu close to its proximal end.

Abdomen brownish black.

Habitat.—China (Szechwan).

Holotype, female, Mount Omei, altitude 11,000 feet, August 18, 1934 (*Graham*). Paratopotype, female, altitude 10,800 feet, August 18, 1934.

The nearest ally of the present fly is *Neolimnophila picturata* Alexander, which differs especially in the coloration of the thorax, much heavier wing pattern, and details of venation. Both species have r-m connecting with Rs some distance before the fork of the latter.

GYMNASTES (GYMNASTES) OMEICOLA sp. nov. Plate 1, fig. 16.

Allied to *cyanea*; thorax black, the mesonotum with faint bluish reflections; abdomen uniformly black; fore femora brown, the tips narrowly yellow; middle and hind femora yellow, with two black and two yellow rings at and before apex, the actual tip yellow; wings whitish subhyaline, with three brown crossbands, the basal one not conspicuously narrowed behind, darkening the distal third to half of cell 2d A.

Male.—Length, about 4 millimeters; wing, 4.2.

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

Rostrum and palpi black. Antennæ black throughout. Head polished black; anterior vertex very wide.

Prothorax and mesothorax polished black, variegated by the sulphur-yellow dorsopleural membrane; in the female the mesonotum with bluish reflections, not or scarcely apparent in male. Halteres black, the outer ends of knobs conspicuously pale sulphur yellow. Legs with the coxæ and trochanters black; middle and hind femora yellow basally, the enlarged outer ends with two black subterminal rings, the tip and a subterminal ring yellow, the widest of these annuli being the outer dark one; fore femora more uniformly dark brown, the tip narrowly pale; tibiæ light yellow, the tips conspicuously blackened; basitarsi yellow, the tips black; remaining tarsal segments black. Wings (Plate 1, fig. 16) whitish subhyaline, with three brown crossbands, the more basal band broadest, in the type male not or scarcely reaching vein R in front, in the female broader and distinctly reaching costal border, behind involving the distal third or more of cell 2d A; outer dark bands almost exactly as in *cyanea*, the outer pale band a little wider; veins brown. Venation: Almost exactly as in *cyanea*.

Abdomen black, without blue reflections; ovipositor with horn-yellow cerci.

Habitat.—China (Szechwan).

Holotype, male, Mount Omei, altitude 7,000 feet, July 17, 1931 (*Franck*). Allotopotype, female. Paratopotype, 1 female, altitude 9,000 feet, July 20, 1931 (*Franck*).

The nearest ally of the present fly is undoubtedly the genotype, *Gymnastes* (*Gymnastes*) *cyanea* Edwards (*violacea* Brunetti), of Ceylon and southern India. The present fly is well-distinguished by the almost total lack of blue or violaceous body reflections; the union of the two dark basal fasciæ of *cyanea* into a single broad band that involves the entire outer end of cell 2d A; and the more conspicuous pale yellow tips of the femora.

GYMNASTES (PARAGYMNASTES) MCKEANI sp. nov. Plate 1, fig. 17.

General coloration black; head, antennæ, and legs entirely black; halteres black, with the tips conspicuously white; wings whitish subhyaline, with three broad brown crossbands, the inner edge of apical band ending at vein M_4 ; R_2 at or close to fork of R_{3+4} .

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

Rostrum and palpi black. Antennæ black throughout; flagellar segments long-oval, with elongate verticils. Head uniform dull black, gray pruinose.

Thorax entirely black, the surface of præscutum slightly nitidous. Halteres black, the outer half of knob white. Legs black throughout. Wings (Plate 1, fig. 17) whitish subhyaline, with three, broad, complete, dark brown crossbands, the first at level of origin of Rs and tip of vein 2d A, narrower than in *nigripes*, being subequal to or only a trifle wider than the white band beyond it; outer dark bands wide but not as extensive as in *nigripes*, the inner edge of the apical band reaching the posterior margin at vein M_4 instead of vein Cu_1 as is the case in *nigripes*; pale band between the central and outer dark areas relatively broad; a small brown postarcular spot; veins brown, a little paler in the areas. Venation: Cell R_3 unusually large; vein R_4 very long, considerably exceeding Rs; R_2 somewhat variable in position, from at, to a short distance before, fork of R_{3+4} (as figured); m-cu before midlength of cell 1st M_2 .

Abdomen black throughout.

Habitat.—Siam (north).

Holotype, male, near Chieng-mai 1928 (*McKean*). Paratopotype, male. Type in the American Museum of Natural History.

Gymnastes (*Paragymnastes*) *mckeani* is named in honor of the collector, Dr. J. W. McKean. The species is closest to *G.* (*P.*) *nigripes* Edwards (Selangor, Perak), differing especially

in the uniform black color of the head and antennæ, and in the distribution of the wing bands.

TEUCHOLABIS (TEUCHOLABIS) IRIOMOTENSIS sp. nov. Plate 1, fig. 18.

Mesonotal præscutum with three confluent polished black stripes; legs black, the bases of fore and middle femora narrowly yellow, the posterior femora entirely black; halteres black throughout; wings subhyaline, the stigma dark brown; veins brownish black; abdominal tergites uniformly black.

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

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

Rostrum relatively elongate, only a little shorter than the remainder of head, black throughout; palpi black. Antennæ black throughout; flagellar segments short-oval to oval, the verticils longer than the segments. Head black, sparsely pruinose, more heavily so on anterior vertex.

Pronotum darkened above, paling to obscure yellow on sides. Mesonotal præscutum with the humeral region broadly yellow, the remainder of surface chiefly occupied by three confluent black stripes; scutum yellow, the lobes black, the central and lateral portions of the suture remaining pale; scutellum yellow, the parascutella darker; postnotum, including pleurotergite, black. Pleura light yellow, the dorsal anepisternum and ventral sternopleurite a little darkened. Halteres black throughout. Legs with the coxæ and trochanters yellow; femora black, the bases of the fore and middle pair narrowly yellow, including the proximal fourth or thereabouts; posterior femora entirely black; tibiæ and tarsi black. Wings (Plate 1, fig. 18) subhyaline, with a faint brownish tinge, most evident in the outer radial field; stigma subcircular, dark brown; cell Sc weakly infumed; veins brownish black. Costal fringe of moderate length. Venation: m-cu close to fork of M, the cell 1st M_2 elongate, subequal to or longer than vein M_{1+2} beyond it.

Abdomen with the tergites black, the sternites in male chiefly light yellow, variegated on sides by darker; sternal pocket and hypopygium black; abdomen in female black throughout but the dark coloration of sternites probably caused by internal discoloration; genital shield and hypovalvæ black, cerci horn-colored.

Habitat.—Japan (Loochoo Islands).

Holotype, male, Iriomote Island, August 20, 1934 (*Gressitt*). Allotopotype, female, August 21, 1934.

The nearest ally is *Teucholabis* (*Teucholabis*) *yezoensis* Alexander (northern Japan), which differs most evidently in the orange-yellow knobs of the halteres, the chiefly yellow posterior femora, and the variegated abdominal tergites. The present fly is entirely different from the three species of the subgenus so far discovered in Formosa.

GONOMYIA (PTILOSTENA) LONGIPENNIS sp. nov. Plate 1, fig. 19.

General coloration gray; scape and pedicel whitish, flagellum dark brown; wings tinged with brown, variegated with darker brown and light yellow; vein R_4 strongly recurved; cell 2d M_2 deep; abdominal tergites uniformly dark brown, the sternites light yellow.

Female.—Length, 6.5 to 7 millimeters; wing, 5 to 6.5.

Rostrum and palpi black. Antennæ with the scape and pedicel whitish; flagellum black, the verticils exceeding the segments in length. Head with the front white, the posterior portions of head dark brown, pruinose; posterior orbits slightly pale.

Pronotum and mesonotum dark gray; anterior lateral pretergites yellow; humeral region of præscutum vaguely brightened; pseudosutural foveæ dark brown; scutellum dark reddish castaneous. Pleura with the dorsal portions dark brown, including the dorsopleural membrane, the ventral portions, including the sternopleurite and meron, abruptly pale yellow. Halteres dusky, the knobs dark brown. Legs with the fore coxæ weakly darkened, the remaining coxæ and all trochanters pale yellow; femora yellow; tibiæ and basal two tarsal segments yellow, the tips weakly darkened; remaining tarsal segments black. Wings (Plate 1, fig. 19) tinged with brown, variegated with darker brown and light yellow; cells C and Sc, together with the wing apex, narrowly and abruptly yellow; dark brown areas at arculus, origin of R_s , m-cu, cord, stigma, and as a cloud near outer end of vein 2d A; a distinct paler brown wash in subapical field of wing, involving cells R_3 , R_4 , R_5 , and 2d M_2 ; veins dark brown, pale in the flavous areas. Venation: Vein R_4 strongly recurved; cell 2d M_2 deep.

Abdominal tergites brownish black; sternites light yellow.

Habitat.—Japan (Loochoo Islands).

Holotype, female, Iriomote Islands, August 24, 1934 (*Gressitt*). Paratopotype, female.

The nearest relative is *Gonomyia* (*Ptilostena*) *teranishii* Alexander (Japan and China), which differs most evidently (in the

female sex) in the broader wings with vein R_4 less recurved and with cell 2d M_2 shallower, and in several details of coloration.

GONOMYIA (GONOMYIA) BIBARBATA sp. nov. Plate 1, fig. 20; Plate 3, fig. 36.

Antennæ dark throughout; cervical region, pronotum, and mesopleura entirely pale yellow, unmarked; mesonotal præscutum and scutum dark brown; scutellum yellow; knobs of halteres darkened; legs dark brown; wings with a faint grayish tinge, the stigma slightly darker; costal fringe long and conspicuous; Sc_1 ending about opposite one-third the length of R_s ; m-cu close to fork of M ; abdominal tergites uniformly dark brown; sternites yellow; male hypopygium with the gonapophyses symmetrical, each appearing as a slender rod with a recurved spine on outer margin before apex.

Male.—Length, about 3.5 millimeters; wing, 4.4.

Rostrum and palpi dark. Antennæ dark throughout; flagellar segments elongate, the verticils relatively conspicuous. Front yellow; posterior portion of head gray.

Cervical region and pronotum clear light yellow. Mesonotal præscutum and scutum almost uniformly dark brown, the median region of the latter a trifle brightened; scutellum clear yellow; mediotergite dark gray. Pleura and pleurotergite uniformly pale yellow. Halteres pale, the knobs darkened. Legs with the coxæ yellow; trochanters brownish testaceous; remainder of legs dark brown. Wings (Plate 1, fig. 20) with a faint grayish tinge, the stigma slightly darker; veins brownish black. Costal fringe long and conspicuous. Venation: Sc relatively long, Sc_1 extending about to opposite one-third the length of R_s , Sc_2 a short distance from its tip; basal section of R_5 short to very short; m-cu close to fork of M .

Abdominal tergites uniformly dark brown, the sternites pale yellow; hypopygium with the basistyles chiefly pale yellow. Male hypopygium with the basistyles elongate, not produced into conspicuous outer lobes; dististyle single, broken in the unique type. Gonapophyses symmetrical, each appearing as a gently curved blackened rod, before apex on outer margin with a small spine or barb, directed slightly basad.

Habitat.—Japan (Loochoo Islands).

Holotype, male, Iriomote Island, August 20, 1934 (*Gressitt*).

The structure of the gonapophyses of the male hypopygium is quite different from any other species known to me. The costal fringe, while long, is not as conspicuous as in the allied *Gonomyia (Gonomyia) longifimbriata* Alexander (Mindanao).

GONOMYIA (GONOMYIA) FOLIACEA sp. nov. Plate 1, fig. 21; Plate 3, fig. 37.

General coloration of mesonotum brownish black, the posterior margin of scutellum yellowish brown; antennæ black throughout; thoracic pleura pruinose with white; knobs of halteres brown; legs obscure yellow; wings with Sc_1 ending nearly opposite midlength of Rs; m-cu some distance beyond fork of M; male hypopygium with the outer dististyle flattened, foliaceous, the tip an acute point, the entire surface with microscopic setulæ.

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

Rostrum yellow; palpi black. Antennæ black throughout, the pedicel much enlarged. Head gray, the front and occipital portion more yellowish.

Cervical sclerites and pronotum yellow. Mesonotal præscutum chiefly brownish black, the humeral region lighter brown; scutum black; scutellum black basally, the outer portion paling to dull yellowish brown; mediotergite dark gray. Pleura heavily pruinose with white, the dorsal pleurites and ventral sternopleurite somewhat darker, the white color most evident as a very diffuse longitudinal stripe; dorsopleural membrane yellow. Halteres brown, the base of stem restrictedly pale, the knobs darker brown. Legs with the coxæ and trochanters brownish yellow to obscure yellow, the tarsi darker. Wings (Plate 1, fig. 21) with a faint darker tinge, the stigma pale brown; cells C and Sc somewhat clearer yellow; veins dark brown. Venation: Sc unusually long, Sc_1 ending about opposite midlength of Rs, Sc_2 a short distance from its tip; basal section of R_5 distinct; m-cu nearly half its length beyond the fork of M.

Abdominal tergites uniformly brown, the sternites yellow; hypopygium obscure yellow. Male hypopygium (Plate 3, fig. 37) with the outer dististyle, *od*, a flattened leaflike blade that narrows to an acute spinous point, the surface with abundant delicate setulæ; inner style, *id*, with a short basal lobe that bears two fasciculate setæ, additional to the smaller normal setæ; outer branch a narrow blackened rod, the tip very obtuse, near base with a few setæ and one conspicuous spine. Phallosome, *p*, complex, the gonapophyses black, subequal in length but apparently slightly asymmetrical in form.

Habitat.—Formosa.

Holotype, male, Sakahen, altitude 3,000 feet, July 16, 1934 (*Gressitt*).

Gonomyia (Gonomyia) foliacea is very different from all described regional species in the structure of the male hypopygium, notably the peculiar foliaceous outer dististyle.

ORMOSIA FUGITIVA sp. nov. Plate 1, fig. 22.

General coloration of præscutum pale testaceous, darkened medially; antennæ black throughout; halteres pale yellow throughout; legs obscure yellow, the terminal tarsal segments black; wings with the ground color milky, the stigma and a narrow seam along cord brown; m and M_3 not angulated at point of origin; anal veins strongly convergent.

Female.—Length, about 4.5 to 4.8 millimeters; wing, 5.5 to 5.8.

Rostrum and palpi brownish black. Antennæ black throughout; verticils long and conspicuous, much exceeding the segments. Head gray, with yellow setæ.

Mesonotal præscutum pale testaceous, darkened medially; scutum pale; scutellum and mediotergite dark plumbeous brown. Pleura dark plumbeous brown. Halteres pale yellow throughout. Legs with the coxæ dark plumbeous; trochanters obscure yellow; remainder of legs obscure yellow, the terminal tarsal segments black. Wings (Plate 1, fig. 22) with the ground color milky, the stigma brown; narrow but conspicuous brown seams along cord and fork of M_{1+2} , best indicated by darkenings of the otherwise pale veins. Trichia of membrane relatively short and inconspicuous. Venation: R_2 shortly beyond fork of R_{2+3+4} ; m and M_3 not angulated at union; $m-cu$ at fork of M ; anal veins strongly convergent.

Abdomen dark brown.

Habitat.—China (Szechwan).

Holotype, female, Wei Chow, 65 miles northwest of Chengtu, altitude 9,000 to 12,500 feet, August 15, 1933 (Graham). Paratopotypes, 2 females.

Ormosia fugitiva is allied to *O. diplotergata* Alexander, *O. machidana* Alexander, and *O. takeuchii* Alexander in the pale wings, with vein R_3 not strongly upcurved at outer end and with m and outer section of vein M_3 not angulated at point of union. The species is well distinguished by the coloration of the body and wings, especially the narrow but distinct dark seam along the cord.

ERIOPTERA (PSILOCONOPA) PROPENSA sp. nov. Plate 1, fig. 23; Plate 3, fig. 38.

Allied to *bifurcata*; general coloration gray, the præscutum with three brown stripes; antennæ and legs black throughout; wings narrow, whitish, the stigma barely indicated; male hypopygium with the inner dististyle bifurcate, the apices of the arms nearly smooth; gonapophyses long and slender.

Male.—Length, 5 to 5.5 millimeters; wing, 6.3 to 6.5.

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

Rostrum dark gray; palpi black. Antennæ black throughout; flagellar segments short-oval. Head gray, more brownish on disk.

Pronotum dark gray. Mesonotal præscutum gray, with three dark brown stripes, the median stripe in cases more or less split by a paler vitta; posterior sclerites of notum gray, the scutal lobes variegated by brown. Pleura clear gray. Halteres pale yellow. Legs with the coxæ clear gray; remainder of legs black. Wings (Plate 1, fig. 23) much narrower than in *bifurcata*, whitish, the prearcular region more yellow; stigma barely indicated by a brownish wash; veins dark brown. Venation as in *bifurcata*, but cells narrower due to the shape of wing, the differences especially noticeable in the anal field.

Abdominal tergites brownish medially, paling to gray on sides; sternites clearer gray; a series of linear blackish impressions along pleura. Male hypopygium (Plate 3, fig. 38) with the outer dististyle, *od*, a simple rod, the apex narrowed and blackened. Inner dististyle, *id*, bifurcate, the apices of both arms smooth or with scattered coarse denticles only. Gonapophyses much longer and more slender than in *bifurcata*.

Habitat.—China (Szechwan).

Holotype, male, Chengtu, altitude 1,700 feet, November 1, 1932, to March, 1933 (*Graham*). Allotopotype, female. Paratopotypes, 4 of both sexes, November 1, 1932, to May 10 to 14, 1933 (*Graham*).

The nearest ally is *Erioptera (Psiloconopa) bifurcata* Alexander (Japan), which is readily told by the broader wings and slight differences in the structure of the male hypopygium, notably of the gonapophyses. I doubt very much whether the subgenus *Ilisia* Rondani can be maintained as distinct from *Psiloconopa* Zetterstedt.

MOLOPHILUS INIMICUS sp. nov. Plate 1, fig. 24; Plate 3, fig. 39.

Belongs to the *gracilis* group and subgroup; general coloration of mesonotum grayish brown, the pleura darker; halteres uniformly light yellow; wings tinged with brownish gray, the stigma and vague clouds on cord slightly darker; anal veins elongate, converging apically; male hypopygium with all lobes of basistyle fleshy and obtuse at tips; ventral lobe with retrorse blackened spines; outer dististyle at apex dilated into a bispinous

scabrous head; inner dististyle an arcuated black rod, strongly bent at near midlength, with about four strong spines on concave face.

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

Rostrum dark brown; palpi black. Antennæ of moderate length, if bent backward extending about to root of halteres, brown throughout; flagellar segments oval to long-oval, the verticils of the basal segments elongate. Head chiefly brown.

Mesonotal præscutum brown, more or less pruinose; anterior lateral pretergites light yellow; scutum and scutellum obscured in the type; mediotergite dark gray. Pleura and sternum brownish black. Halteres uniformly light yellow throughout. Legs with the coxæ and trochanters dark brown; femora obscure brownish yellow, the tips narrowly brighter; tibiæ brown; tarsi black. Wings (Plate 1, fig. 24) with a brownish gray tinge, the stigmal region and vague clouds on anterior and posterior cords weakly darker; prearcular and costal regions clearer yellow; veins brownish yellow; macrotrichia dark brown. Venation: R_2 lying shortly distad of level of r-m; m-cu sinuous, about one-half the petiole of cell M_1 ; anal veins elongate, convergent apically, narrowing cell 1st A before outer end.

Abdomen dark brown, the hypopygium a little brighter, brownish yellow. Male hypopygium (Plate 3, fig. 39) with all three lobes of basistyle blunt at tips, the dorsal lobe more slender, with pale setæ only; mesal lobe, *mb*, gently curved, with long black spines; ventral lobe, *vb*, broad, with about sixteen to eighteen retrorse black spines. Outer dististyle, *od*, a slender black rod, the apex dilated into a bispinous head, the surface surrounding these spines with microscopic scabrous points. Inner dististyle, *id*, a little longer, appearing as a relatively slender black rod that is bent almost at a right angle, narrowed to an acute point, the base with a few small pale tubercles, each tipped with a weak seta; bend of style on concave face with about four strong black spines.

Habitat.—China (Szechwan).

Holotype, male, Mount Omei, altitude 10,800 feet, August 18, 1934 (*Graham*).

Molophilus inimicus is very different from the other regional species of the genus. It is most generally similar to *M. crassulus* Alexander, but all details of the hypopygium are quite distinct.

ILLUSTRATIONS

[Legend: *a*, Ædeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *id*, inner dististyle; *mb*, mesal lobe of basistyle; *od*, outer dististyle; *p*, phallosome; *s*, sternites; *t*, tergites; *vb*, ventral lobe of basistyle; *vd*, ventral dististyle.]

PLATE 1

- FIG. 1. *Ptychoptera clitellaria* sp. nov., venation.
2. *Paracladura omeiensis* sp. nov., venation.
3. *Tipula* (*Formotipula*) *unirubra* sp. nov., venation.
4. *Nephrotoma biarmigera* sp. nov., venation.
5. *Nephrotoma evittata* sp. nov., venation.
6. *Nephrotoma caudifera* sp. nov., venation.
7. *Nephrotoma nigrostylata* sp. nov., venation.
8. *Phalacrocerca minuticornis* sp. nov., venation.
9. *Limonia* (*Limonia*) *prudentia* sp. nov., venation.
10. *Limonia* (*Dicranomyia*) *veternosa* sp. nov., venation.
11. *Limonia* (*Rhipidia*) *monoctenia* sp. nov., venation.
12. *Antocha* (*Antocha*) *lacteibasis* sp. nov., venation.
13. *Hexatoma* (*Eriocera*) *ishigakiensis* sp. nov., venation.
14. *Hexatoma* (*Eriocera*) *iriomotensis* sp. nov., venation.
15. *Neolimnophila perreducta* sp. nov., venation.
16. *Gymnastes* (*Gymnastes*) *omeicola* sp. nov., venation.
17. *Gymnastes* (*Paragymnastes*) *mckeani* sp. nov., venation.
18. *Teucholabis* (*Teucholabis*) *iriomotensis* sp. nov., venation.
19. *Gonomyia* (*Ptilostena*) *longipennis* sp. nov., venation.
20. *Gonomyia* (*Gonomyia*) *bibarbata* sp. nov., venation.
21. *Gonomyia* (*Gonomyia*) *foliacea* sp. nov., venation.
22. *Ormosia fugitiva* sp. nov., venation.
23. *Erioptera* (*Psiloconopa*) *propensa* sp. nov., venation.
24. *Molophilus inimicus* sp. nov., venation.

PLATE 2

- FIG. 25. *Tipula* (*Formotipula*) *unirubra* sp. nov., male hypopygium, details.
26. *Nephrotoma biarmigera* sp. nov., male hypopygium, details.
27. *Nephrotoma evittata* sp. nov., male hypopygium, details.
28. *Nephrotoma definita* sp. nov., male hypopygium, details.
29. *Nephrotoma caudifera* sp. nov., male hypopygium, ninth tergite.
30. *Nephrotoma caudifera* sp. nov., male hypopygium, details.
31. *Nephrotoma nigrostylata* sp. nov., male hypopygium, details.

PLATE 3

- FIG. 32. *Limonia* (*Limonia*) *prudentia* sp. nov., male hypopygium.
33. *Limonia* (*Dicranomyia*) *veternosa* sp. nov., male hypopygium.
34. *Limonia* (*Rhipidia*) *monoctenia* sp. nov., male hypopygium.
35. *Antocha* (*Antocha*) *lacteibasis* sp. nov., male hypopygium.
36. *Gonomyia* (*Gonomyia*) *bibarbata* sp. nov., male hypopygium, gonapophysis.
37. *Gonomyia* (*Gonomyia*) *foliacea* sp. nov., male hypopygium.
38. *Erioptera* (*Psiloconopa*) *propensa* sp. nov., male hypopygium.
39. *Molophilus inimicus* sp. nov., male hypopygium.

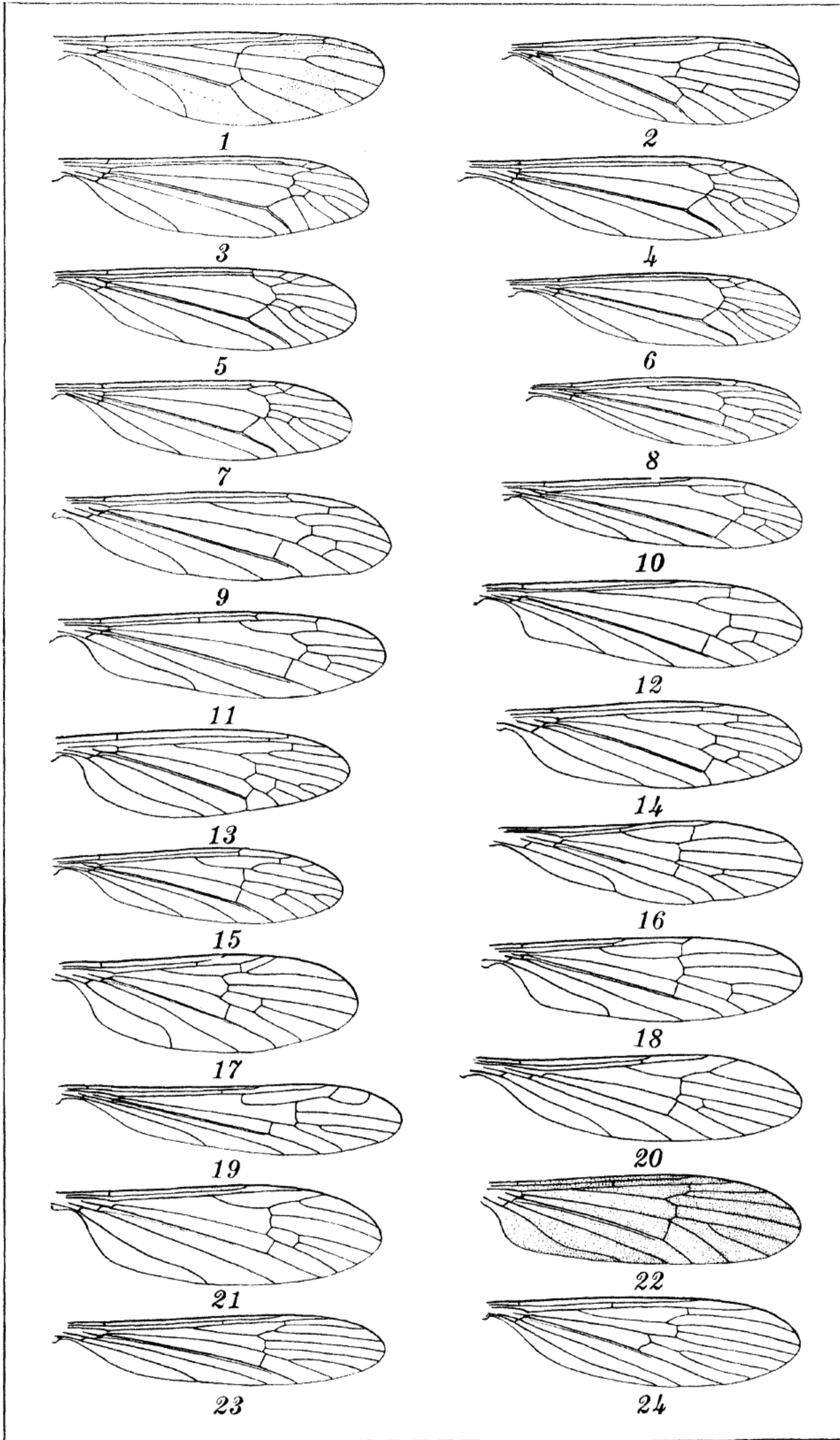


PLATE 1.

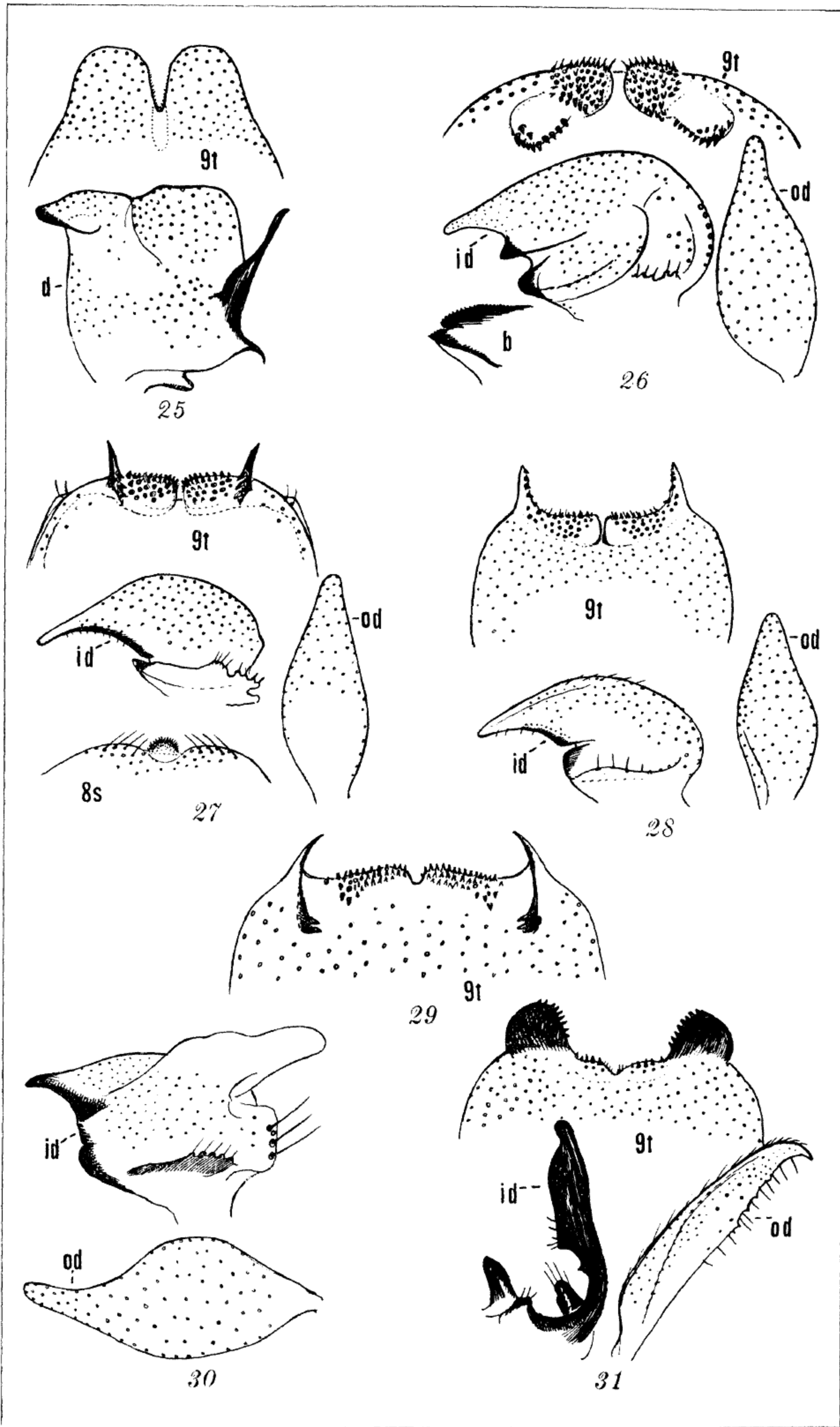


PLATE 2.



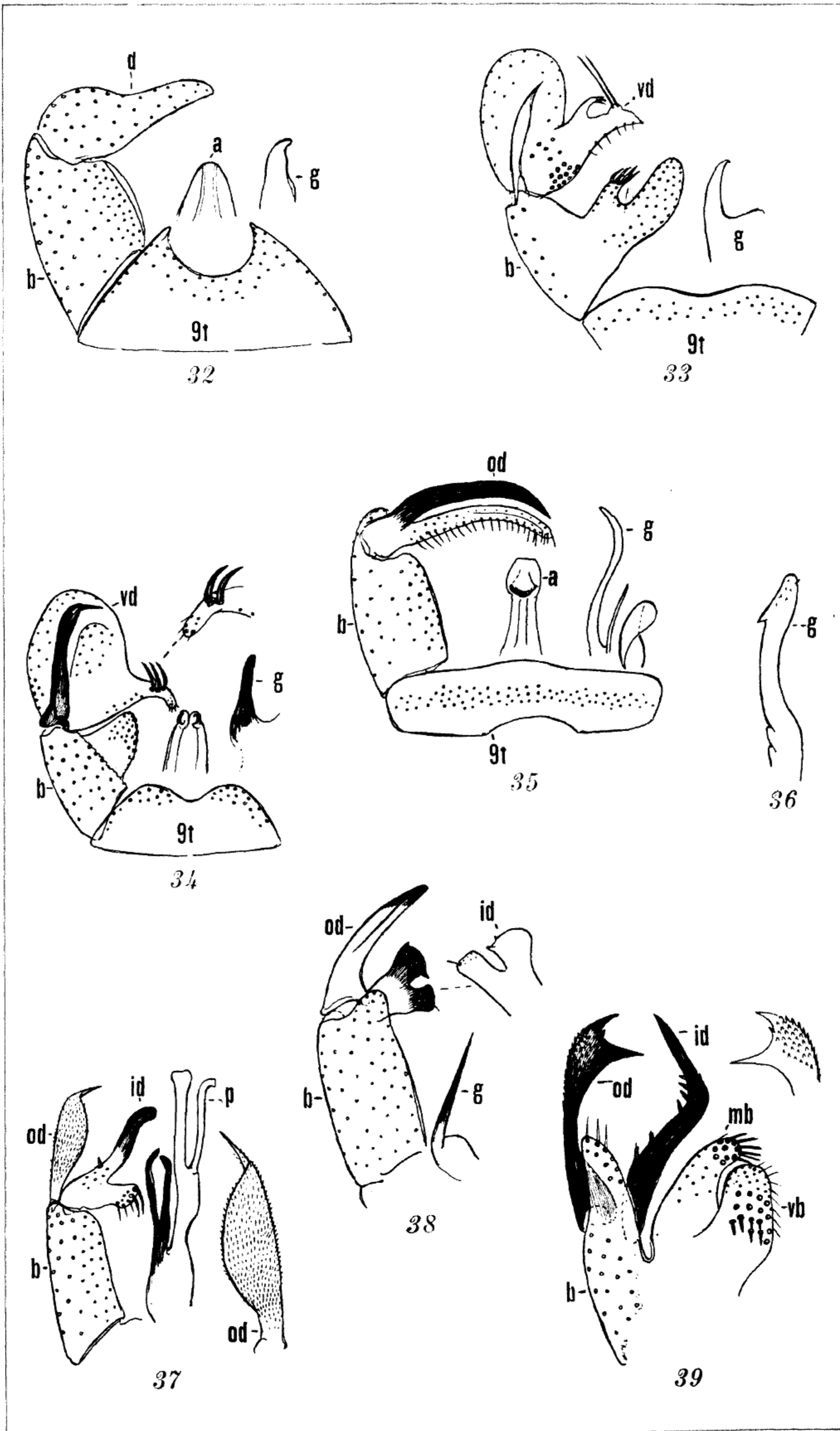


PLATE 3.

