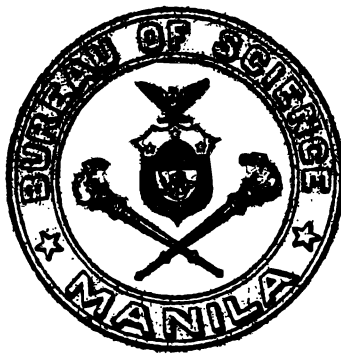


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## NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN ASIA (DIPTERA), XLIV

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### FOUR PLATES

In the present article I am discussing crane flies from several localities in Asia, including the following countries and collectors: Manchukuo: Weymarn; Japan: Esaki, Issiki, Machida, and Suenson; China and Indo-China: Brownell, Cooman, Franck, Graham, Kellogg, Klapperich, Piel, Suenson, and Tsen; the Philippines: Rivera; and British India: Nathan and Sircar. I am greatly indebted to all of the above scientists and collectors for their interest in saving specimens of these flies. Except where indicated to the contrary in the text, the types of the novelties are preserved in my collection of these flies.

### TIPULINÆ

TANYPTERA CHRYSOPHÆA sp. nov. Plate 1, fig. 1; Plate 2, fig. 25.

General coloration brownish yellow to reddish yellow; antennæ and halteres yellow throughout; basal three flagellar segments elongate-cylindrical, outer segments short-oval; legs yellow, outer tarsal segments black; wings with basal two-thirds intense yellow, especially the costal portion, apex broadly brown; Rs exceeding twice length of m-cu; abdomen with cerci long and relatively narrow.

*Female*.—Length, about 24 millimeters; wing, 18; antenna, about 5.5.

Frontal prolongation of head brownish yellow, without nasus, setæ yellow; palpi with basal three segments brownish yellow, terminal segment black. Antennæ (Plate 2, fig. 25) yellow throughout; first flagellar segment elongate, subequal in length to scape; second segment about two-thirds as long as first; third segment about three-fourths as long as second; remaining segments conspicuously smaller, especially seventh to twelfth, inclusive, which are irregularly short-oval; terminal segment abruptly smaller. Head dull black; anterior vertex wide.

Pronotum obscure yellow. Mesonotal præscutum shiny obscure yellow or brownish yellow, with three more reddish stripes, median stripe with a capillary black median vitta on cephalic third of sclerite; a lateral brown spot on margin behind humeri; setæ or præscutal interspaces golden yellow; posterior sclerites of notum reddish yellow, parascutella darker. Pleura yellow, variegated with black on ventral anepisternum, ventral sternopleurite, pteropleurite, meron, and ventral pleurotergite. Halteres yellow throughout. Legs with coxæ and trochanters yellow; femora and tibiæ yellow, unmarked; tarsi passing through brownish yellow to black. Wings (Plate 1, fig. 1) with basal two-thirds intense yellow, distal third beyond cord medium brown; prearcular field, costal border, and a seam along vein Cu more saturated yellow; stigma yellow; basal third of cell 1st  $M_2$  and adjoining part of cell  $M_3$  of yellow ground color; outer ends of cells Cu and 1st A brown; veins yellow in saturated portions, remainder, including Rs, M, and anal veins brown. Venation: Rs relatively long, exceeding twice length of m-cu;  $R_2$  relatively long and conspicuous, so  $R_1$  and  $R_{1,2}$  are in virtual longitudinal alignment; petiole of cell  $M_1$  about one-half m; m-cu just before fork of  $M_{3,4}$ .

Abdomen uniformly reddish yellow; ovipositor with cerci long and relatively narrow, much narrower than in *antica* but wider than in typical members of the genus. Similarly, the preceding genital segments are shorter and less attenuated than in typical forms, as *atrata*.

*Habitat*.—China, Fukien.

Holotype, female, Kuantun, altitude 2,500 to 3,000 meters, April 15, 1936 (*Klapperich*); type returned to the Zoologisches Forschungsinstitut, Bonn, Germany.

*Tanyptera chrysophæa* is readily told from other regional species by the coloration, especially the pattern of the wings, and by the structure of the ovipositor.

CTENACROSCELIS PERSESSILIS sp. nov. Plate 1, fig. 2.

General coloration of mesonotum dark brown, præscutum with four slate-gray stripes; antennæ black, intermediate flagellar segments strongly produced on ventral face; posterior sclerites of mesonotum yellow; pleura pale brown with a golden-yellow longitudinal stripe; halteres and legs brownish black; wings with a strong brownish tinge; a strong element  $R_{1,2,3}$  before fork of  $R_{1,2}$  and  $R_3$ ; cell  $M_1$  broadly sessile; abdominal tergites

dark brownish gray, lateral borders of segments paling to buffy; genital shield of ovipositor chestnut-brown.

*Female*.—Length, about 30 millimeters; wing, 27.

Frontal prolongation of head elongate, subequal to or a little longer than remainder of head, dark brown, narrowly light gray-pruinose along dorsal surface; nasus conspicuous; palpi black. Antennæ black, scape pruinose; first flagellar segment long-cylindrical, exceeding scape in length; fifth to eighth flagellar segments, inclusive, with ventral face strongly produced; terminal three segments nearly cylindrical, last shortest, about one-half penultimate. Head gray-pruinose, with a brownish median vitta; vertical tubercle low.

Pronotum dark brown medially, paling to buffy yellow on sides. Mesonotal præscutum with ground color dark brown, virtually restricted to humeral portions of sclerite, remainder of disc with four slate-gray stripes, intermediate pair of stripes separated by a ground vitta except at suture where all four stripes become confluent; lateral portions of præscutum dark brown, extreme cephalic margins of anterior portion of sclerite buffy; scutal lobes slate-gray, median area behind suture with a very conspicuous dark-brown triangular area, remainder of scutum obscure yellow; scutellum obscure yellow, restrictedly darkened medially in front, parascutella dark; mediotergite yellow. Pleura pale brown, with a more golden-yellow longitudinal stripe from behind fore coxæ to base of abdomen, this stripe covered with delicate silken setulæ; ventral sternopleurite darker brown; dorsopleural membrane buffy. Halteres brownish black, base of stem restrictedly pale. Legs with coxæ dark brown, pruinose; trochanters black, sparsely pruinose; remainder of legs brownish black. Wings (Plate 1, fig. 2) with a strong brownish tinge, centers of cells M, 2d A, and outer medial cells more brownish yellow; veins brown. Venation: Sc<sub>1</sub> preserved as a strong spur; R<sub>1</sub> beyond free tip of Sc<sub>2</sub> strongly longitudinal in position, forming a relatively long fusion of R<sub>1+2+3</sub>; R<sub>3</sub> only moderately sinuous, cell but little constricted at midlength, wide at margin; cell M<sub>1</sub> broadly sessile; cell 1st M<sub>2</sub> elongate, outer end narrowed; m-cu at fork of M<sub>3+4</sub>.

Abdominal tergites dark brownish gray, lateral borders of segments paling to buffy; basal sternites dark gray, outer segments paling to reddish brown. Ovipositor with genital shield chestnut-brown, valves dark chestnut-brown.

*Habitat*.—China, Szechwan.

Holotype, female, Hai-tsi-pin, altitude 13,000 feet, July and August 1937 (*Graham*); United States National Museum.

*Ctenacroscelis persessilis* is quite distinct from all other species of the genus so far made known, differing conspicuously in the coloration and in the venation, as the broadly sessile cell  $M_1$ .

**TIPULA (YAMATOTIPULA) KAMIKOCHIENSIS** sp. nov. Plate 1, fig. 3; Plate 2, fig. 26.

Belongs to the *iroquois* group, allied to *machidai*; large (wing, male, 20 millimeters); antennæ relatively short, flagellum black; basal enlargements of segments only poorly developed; general coloration of notum gray, pronotum, scutum, and scutellum with a median brown vitta; femoral tips broadly blackened; tibiæ black, extreme bases pale; wings brownish yellow, restrictedly patterned with darker, including outer radial field; wing petiole long; abdominal tergites yellow, lateral borders gray, median area with a nearly continuous black stripe; hypopygium black; male hypopygium with apical portion of tergite flattened, yellow, caudal margin with a V-shaped notch; outer dististyle pale, truncated at apex; inner dististyle with apex of rostral prolongation broadly obtuse, outer margin of style with two blackened points, longest point an acute spine that is directed outward.

*Male*.—Length, about 16 millimeters; wing, 20; antenna, about 3.

Frontal prolongation of head dark brown, grayish pruinose, relatively short, about one-half remainder of head; nasus long and slender; palpi brownish black, moderately long terminal segment pale on basal half, infuscated on distal portion. Antennæ relatively short; scape brownish yellow, more darkened outwardly; pedicel brown; flagellum black; flagellar segments with basal enlargements only poorly developed, verticils longer than segments; terminal segment reduced, pointed at apex. Head gray, with a narrow, dark-brown, median vitta; vertical tubercle small.

Pronotal scutum gray, with a narrow, median, dark-brown vitta, scutellum pale yellow. Mesonotal præscutum light gray, with four conspicuous brown stripes, intermediate pair of stripes separated by a dark-gray central area, mesal edges of stripes vaguely indicated by capillary dusky lines; lateral stripes entire, without differentiated margins; humeral region restrictedly buffy, lateral præscutal border behind humeri dark; posterior sclerites of notum dark gray with a slightly darker median vitta extending from suture to about midlength of scutellum; post-

notum clearer gray. Pleura light gray on mesepisternum, anepisternum and ventral sternopleurite darker gray; meron gray, darker ventrally; pteropleurite and pleurotergite, with the dorso-pleural membrane, more buffy yellow, pleurotergite more darkened immediately above the halteres. Halteres with stem brownish yellow, knob dark brown. Legs with coxæ light gray; trochanters obscure yellow; femora yellow, tips broadly blackened, on fore pair occupying nearly distal fourth, narrower on posterior femora where only about outer sixth is included; tibiæ black, bases narrowly obscure yellow; tarsi black; claws with strong lateral spine. Wings (Plate 1, fig. 3) brownish yellow, prearcular and costal fields somewhat clearer yellow; stigma oval, dark brown; wing tip, especially in outer radial field, weakly infuscated; Cu narrowly seamed with brown, much more conspicuous on the distal section and along m-cu; vein 2d A restrictedly seamed with darker; veins brownish black, paler in brightened portions. Wing base long and petiolate; squama naked. Venation:  $M_{3+4}$  shorter than basal section of  $M_{1+2}$ ; cell 2d A relatively wide.

Abdomen with basal tergite yellow basally and on sides, brownish pruinose behind; succeeding tergites yellow, lateral borders broadly gray, median portion with a conspicuous brownish-black stripe that is narrowly interrupted at caudal border of segment; sternites light yellow; outer segments and hypopygium uniformly blackened. Male hypopygium (Plate 2, fig. 26) with tergite, 9t, produced caudad into a very flattened, depressed, yellow blade, the caudal margin of which bears a V-shaped notch, median area beneath more or less carinate; ventral surface of pale apical portion on either side with a yellow flattened lobe; cephalic portion of tergite blackened and with abundant black setæ, forming a densely setiferous triangular block in the central portion, point of triangle directed caudad. Basistyle not or only weakly produced at apex, its outer surface with several long, yellow setæ. Outer dististyle, *od*, a pale flattened blade, apex truncated, outer margin strongly dilated or bellied outwardly. Inner dististyle, *id*, as shown, bearing a short, obtuse, blackened point that is directed backward, and a longer, black, acute spine directed outwardly; rostrum broadly obtuse, blackened. Gonapophyses only weakly obtuse at tips.

*Habitat*.—Japan, Honshiu.

Holotype, male, Kamikochi, altitude 5,000 feet, July 26, 1939 (Suenson).

This interesting fly is most nearly related to *Tipula* (*Yamatotipula*) *machidai* Alexander and *T. (Y.) sempiterna* Alexander among the described regional species, differing from both especially in the distinct structure of the male hypopygium. The antennæ are much shorter than in *machidai*, while body size and general coloration differ in all three species. I had earlier<sup>1</sup> referred the species of this group to the subgenus *Oreomyza* Pokorny. The recent discovery of several new species in the southern Appalachian Mountains of eastern North America now seems to indicate that the three Japanese species, as well as the five eastern Nearctic members of the *iroquois* group, are better referred to the subgenus *Yamatotipula* Matsumura.

**TIPULA (YAMATOTIPULA) SUENSONI** Alexander.

*Tipula suenisoni* ALEXANDER, *Encycl. Ent. Diptera* 2 (1925) 89-91, figs. 4, 5.

Kuliang, Fukien Province, eastern China, 1,500 to 2,500 feet, April 6 to 13, 1938; 1,800 to 2,000 feet, July 1 to 7, 1938 (*Kellogg*).

**TIPULA (ACUTIPULA) RECEPTOR** sp. nov. Plate 1, fig. 4; Plate 2, figs. 27 and 28.

Allied to *quadrinotata*; general coloration of notum brownish gray, præscutum with four narrow, darker brownish-gray stripes; scutellum and postnotum clearer gray, pleura yellow; femora yellow, tips narrowly but conspicuously infuscated; wings with a weak brown pattern, sparsely variegated with cream-colored areas; a small brown cloud before midlength of cell Cu; Rs subequal in length to m-cu; male hypopygium with median lobe of tergite large, divided into two flaplike blades set with numerous black spinules; eighth sternite unprovided with brushes of setæ.

*Male*.—Length, about 15 to 16 millimeters; wing, 16 to 17; antenna, about 3 to 3.1.

Frontal prolongation of head brown; nasus elongate; palpi brown. Antennæ of moderate length; basal three or four segments obscure yellow, succeeding segments weakly bicolored, darker basally than at tips, outer segments more uniformly infuscated; basal swellings of segments only poorly indicated; verticils relatively short. Head brownish gray with a narrow, dark-brown, median line; anterior vertex about two and one-half times diameter of scape.

<sup>1</sup> *Phil. Jour. Sci.* 57 (1935) 122.

Pronotum obscure brownish yellow, with a distinct median impression. Mesonotal præscutum brownish gray with four narrow, darker brownish-gray stripes that are vaguely bordered by darker; scutum brownish gray; scutellum and postnotum clearer gray, the former not darker behind but with vague indications of a darker median vitta. Pleura yellow, dorsal pleurotergite dark. Halteres elongate, dark brown. Legs with coxæ and trochanters yellow; femora yellow, tips narrowly but conspicuously infuscated, the amount subequal on all legs; tibiæ brownish yellow, tips weakly darkened; tarsi elongate, light brown, terminal segments passing into black. Wings (Plate 1, fig. 4) with a weak brown pattern, variegated with cream-colored areas, the latter most evident as a broad obliterative streak at cord and across bases of cells  $M_1$  to  $M_4$ , inclusive; cell Cu whitened basad of the darkened area before midlength, the latter relatively small; cells C and Sc, with stigma, slightly darker than ground; a slight darkened wash near outer end of cell M; veins brown, pale in obliterative streak. Wing of paratype slightly wider than that of type. Venation: Rs subequal to or a trifle longer than m-cu, the latter a short distance before fork of  $M_{3+4}$ .

Abdominal tergites obscure yellow, with indications of a slightly darker median stripe, more distinct on outer segments; lateral tergal borders continuously darkened; sternites obscure yellow, outer three segments uniformly dark brown. Male hypopygium with median lobe of tergite (Plate 2, fig. 27, 9t) conspicuous, appearing as two flattened blades separated by a conspicuous U-shaped notch, lobes set with abundant, very short, blackened pegs. Apex of basistyle (Plate 2, fig. 28, b) produced into a short lobe bearing a brush of long yellow setæ that much exceed the lobe in length. Outer dististyle, *od*, pale, narrowly obtuse at apex, widely dilated across basal third, width at this point about two-thirds length. Inner dististyle (Plate 2, fig. 28, *id*) complex, as illustrated, consisting of a long outer spine, acute apical point distinctly darkened and set off by a weak constriction; between this spine and beak a smaller, straight spine; beak relatively small, flattened; setæ on face of style very long but slender. Ninth sternite with the usual dense brushes of setæ on either side of midline. Eighth sternite almost glabrous, posterior margin with only scattered setæ, quite without hair brushes or pencils as found in related Oriental species.



*Habitat*.—Assam, Khasi Hills.

Holotype, male, Cherrapunji, altitude 4,000 feet, 1935 (*Sir-car*).

Paratopotype, male.

The closest regional ally of the present fly is evidently *Tipula* (*Acutipula*) *quadrinotata* Brunetti, which differs in details of coloration of body, legs, and wings, but especially in the structure of the male hypopygium, notably the tergite, outer dististyle, inner dististyle, and the eighth sternite, the last structure having conspicuous hair brushes that are lacking in the present fly.

**TIPULA (SCHUMMELIA) CRASTINA** sp. nov. Plate 1, fig. 5; Plate 2, fig. 29.

Belongs to the *variicornis* group; general coloration brown, præscutum brownish yellow with three darker-brown stripes, central stripe much paler in front and divided by a capillary dark-brown vitta; posterior sclerites of notum brown; antennæ bicolored, segments yellow with dark-brown bases; legs black, femoral bases obscure yellow, narrowest on fore pair; wings with a brownish tinge, sparsely patterned with darker brown; large cream-colored areas before and beyond large dark-brown stigma; cell 1st  $M_2$  small, its proximal end lying far basad of other elements of anterior cord; male hypopygium with tergite produced medially into a broad, more or less depressed lobe; eighth sternite moderately sheathing, without lobes.

*Male*.—Length, about 9 to 9.5 millimeters; wing, 10 to 10.5; antenna, about 3.5 to 3.6.

Frontal prolongation of head brown; nasus stout; palpi dark brown. Antennæ (male) of moderate length; basal three segments yellow, all remaining segments bicolored, basal enlargement dark brown, the more extensive apical portions yellow; basal enlargements only feebly developed; longest verticils a trifle shorter than segments. Head grayish brown to dark brown, anterior vertex a little brightened; a more or less evident capillary, median, dark vitta.

Pronotum brown. Mesonotal præscutum with ground color brownish yellow, with three darker-brown stripes, central stripe divided by a capillary, darker brown, median vitta; cephalic two-thirds of median stripe much paler, not or scarcely differentiated from the ground; lateral stripes entire; lateral and humeral portions of præscutum slightly darkened; scutum with median area obscure yellow, lobes chiefly darkened; scutellum

and mediotergite brown, sparsely pruinose. Pleura almost uniformly dark brown; dorsopleural region dusky. Halteres with stem and apex of knob obscure yellow, base of knob dark brown. Legs with coxæ brownish testaceous; trochanters yellow; remainder of legs black, femoral bases yellow, narrowest on forelegs, more extensive on posterior pair, involving basal third to half; claws small, simple. Wings (Plate 1, fig. 5) with a brownish tinge, prearcular and costal regions more brownish yellow; stigma large, oval, dark brown; narrow but conspicuous brown seams along cord and vein Cu; much narrower seams on outer radial veins, Rs and 2d A; wing apex and posterior border narrowly seamed with darker; conspicuous cream-colored areas before and beyond stigma; obliterative areas crossing cell 1st  $M_2$ ; veins brown, paler in costal and prearcular fields. Venation: Rs relatively long, arcuated, exceeding m-cu;  $R_2$  oblique, in approximate longitudinal alignment with  $R_{1+2}$ ; cell 1st  $M_2$  small, its inner end lying far proximad of other elements of anterior cord; m-cu before midlength of  $M_{3+4}$ , in the type specimen only a short distance beyond fork of M.

Abdominal tergites obscure yellow, posterior and lateral borders darkened; a more or less distinct brown, median vitta; outer segments, including the small hypopygium, brownish black; sternites obscure yellow. Male hypopygium (Plate 2, fig. 29) with ninth tergite, 9t, produced medially into a broad, more or less depressed lobe, the sides of which are densely hairy; lateral tergal lobes broad, truncated and feebly emarginate at apices. Outer dististyle, *od*, relatively broad and flattened, pale throughout. Inner dististyle, *id*, simple, oval in outline, with abundant black retrorse setæ over the surface; beak slender, blackened. Eighth sternite, 8s, moderately large and sheathing, margin unarmed with lobes or modified groups of setæ.

*Habitat*.—China, Fukien.

Holotype, male, Kuliang, altitude 1,800 to 2,000 feet, June 1 to 3, 1937 (*Kellogg*). Paratopotype, male, altitude 2,000 feet, May 22 to 27, 1937.

*Tipula* (*Schummelia*) *crastina* is entirely distinct from other small regional species of the subgenus. It is most similar to species such as *T. (S.) insulicola* Alexander, yet entirely distinct.

TIPULA (OREOMYZA) LACUNOSA sp. nov. Plate 1, fig. 6; Plate 3, fig. 30.

Allied to *quadrifasciata*; general coloration gray, præscutum with four darker brownish-gray to brown stripes; præscutal

interspaces with conspicuous setigerous punctures; antennæ with basal three segments yellow, remainder of flagellum almost uniformly black; halteres obscure yellow, base of knob weakly darkened; legs black, femoral bases yellow, narrowest on fore-legs; wings whitish subhyaline, with four more or less complete dark crossbands;  $R_{1+2}$  chiefly atrophied; male hypopygium with outer dististyle very expanded; inner dististyle with a long glabrous rod on outer margin at base; outer margin of beak without conspicuous modified setæ; gonapophyses consisting of strong blackened spines.

*Male*.—Length, about 10 millimeters; wing, 11.5; antenna, about 3.5.

*Female*.—Length, about 12 to 13 millimeters; wing, 11.5 to 12.

Frontal prolongation of head gray-pruinose above, darker laterally; nasus distinct; palpi black. Antennæ relatively short; basal three segments light yellow, succeeding two segments black with extreme tips paling to reddish, outer segments uniform black; basal swellings of segments not or scarcely differentiated; verticils a little shorter than segments; terminal segment reduced. Head brownish gray, front and orbits clearer gray; a scarcely evident darker median vitta.

Pronotum brownish gray. Mesonotal præscutum light gray with four darker brownish-gray to brown stripes; punctures of interspaces brown, large, conspicuous; scutum gray, each lobe with disconnected brown areas, space between latter with several setigerous punctures; scutellum gray, narrowly darkened medially; postnotum light gray, mediotergite with indications of a capillary dark vitta. Pleura gray, dorsopleural membrane pale yellow. Halteres obscure yellow, base of knob weakly darkened. Legs with coxæ gray; trochanters brownish yellow; femora obscure yellow basally, tips broadly black, most extensive on fore pair where distal three-fourths or more is blackened, on posterior legs including about outer half or less; tibiæ and tarsi black; claws (male) with basal tooth. Wings (Plate 1, fig. 6) whitish subhyaline, with four more or less complete dark crossbands, first crossband postarcular, second at level of origin of  $R_s$ , much widened but paler in posterior portion; third band at cord, fourth band apical, darker in radial field; cell C dark brown,  $Sc$  more brownish yellow; stigma dark brown; broad, entire white band beyond cord narrowest at cephalic border in basal portion of cell  $Sc_2$  and at posterior end in cell  $M_3$ , very wide in radial field; outer medial veins very narrowly seamed

with brown though scarcely interrupting white band; anterior prearcular field dark, posterior portion whitish, including veins; veins dark brown, pale yellow in ground areas. Venation: Rs very long, approximately three times m-cu or nearly so; tip of  $R_{1-2}$  atrophied.

Abdominal tergites reddish brown, sparsely pruinose, with darker-brown median stripe that becomes widened behind, posterior borders of segments pale, sparsely pruinose; no distinct darkened lateral stripes; sternites reddish brown, outer segments more pruinose. Male hypopygium (Plate 3, fig. 30) with ninth tergite, 9t, broadly emarginate, with a tiny median notch from which a dorsal furrow extends cephalad the length of the sclerite; lateral lobes yellow, short, obtuse. Outer dististyle, *od*, a very broadly expanded pale blade. Inner dististyle, *id*, with a long glabrous rod on outer face at base, with a setiferous flange just distad of it; beak of style blackened, relatively narrow; no series of strong marginal setæ as in *quadrifasciata*. Gonapophyses conspicuously spinous, as shown. Eighth sternite with numerous long, pale setæ on median portion of caudal margin, with an additional brush in membrane between eighth and ninth sternites.

*Habitat*.—China, Fukien.

Holotype, male, Kuliang, altitude 1,500 to 2,500 feet, April 6 to 13, 1938 (*Kellogg*). Allotopotype, female, April 10, 1938. Paratopotype, 1 female, altitude 2,000 feet, April 20, 1938.

Most closely related to the Japanese *Tipula* (*Oreomyza*) *quadrifasciata* Matsumura, differing especially in the structure of the male hypopygium, especially the dististyles and gonapophyses.

**TIPULA (OREOMYZA) SUBDEPRESSA** sp. nov. Plate 1, fig. 7; Plate 3, figs. 31 to 33.

Allied to *depressa*; mesonotal præscutum gray with four narrow but conspicuous dark-brown stripes; fore femora black with only the bases narrowly brightened, remaining femora obscure yellow, tips rather narrowly blackened; wings brown, variegated by more cream-colored areas before cord and beyond stigma; male hypopygium with lateral tergal arms acute, with a narrow blackened inner lobe; inner dististyle with basal outer lobe separated from main body of style by a circular notch; eighth sternite with median pale lobe about two and one-half times as long as wide.

*Male*.—Length, about 14 millimeters; wing, 16; antenna, about 4.1.

Frontal prolongation of head black, heavily pruinose; nasus distinct; palpi black. Antennæ of moderate length; scape reddish brown, darker above and at base; pedicel yellow; flagellum uniformly black; flagellar segments moderately incised, the longest verticils a trifle shorter than segments. Head brownish gray, lighter in front, more suffused with darker behind; a capillary, dark-brown, median vitta extending from low vertical tubercle backward, becoming obsolete at near midlength of posterior vertex.

Pronotum brownish gray. Mesonotal præscutum gray, with four narrow but conspicuous dark-brown stripes, intermediate pair of stripes forming the broad borders of a darker-gray, median area, narrowed behind; the gray central portion nearly twice as wide as the dark stripes at cephalic portion of sclerite; lateral stripes narrow; posterior sclerites of mesonotum gray, each scutal lobe with two dark-brown areas; central portion of scutellum more darkened; mediotergite with a capillary dusky line. Pleura dark gray, with a more or less distinct lighter-gray area across ventral anepisternum, pteropleurite, and pleurotergite; dorsopleural membrane buffy. Halteres with stem yellow, knob dark brown. Legs with forecoxæ gray, remaining coxæ gray basally, paling to buffy at tips, buffy color unusually broad on posterior pair; trochanters yellow; fore femora black, only basal fifth or sixth brightened; middle and hind femora obscure yellow, brighter at base, tips (distal sixth or seventh) blackened; tibiæ dark brown, tips very narrowly black, fore tibiæ more uniformly brownish black; tarsi black; claws simple, hairy. Wings (Plate 1, fig. 7) with a strong brown tinge, prearcular field and cell Sc yellowish; cell C more brownish yellow; stigma brown; a conspicuous cream-colored poststigmatal area in subbasal portions of outer radial field, with similar areas before cord in cells  $R_1$ , R, and M; a restricted obliterative streak crossing cell 1st  $M_2$  into base of cell  $M_3$ ; a pale marginal streak in cell 1st A near tip of vein 2d A; brown ground color deepening to a conspicuous seam along veins Cu and  $Cu_1$ ; veins brown, yellow or brownish yellow in brightened costal portions. Squama naked. Venation:  $R_{1,2}$  entire; Rs about twice m-cu; basal section of  $M_{1,2}$  shorter than  $M_{3,4}$ .

Abdominal tergites yellow, conspicuously trivittate with brownish black, lateral stripes paler on extreme margins of sclerite; sternites yellow; terminal segments more uniformly blackened, central portion of tergite and distal portions of ninth

sternite obscure yellow. Male hypopygium with caudal margin of tergite (Plate 3, fig. 31, 9t) conspicuously toothed and blackened, including a strong, acute, median tooth that is flattened and has a carinate dorsal ridge; lateral angles of caudal border produced into acute points, with a longer, entirely blackened inner lobe that is irregularly lobed at apex. Outer dististyle (Plate 3, fig. 32, *od*) strongly flattened, constricted at base. Inner dististyle, *id*, with a strong lobe on outer margin at base, separated from main body of style by a circular notch; rostrum of style long and narrow, blackened. Gonapophyses (Plate 3, fig. 33, *g*) with outer lobe flattened, broader than acute spine at base. Eighth sternite (Plate 3, fig. 33, 8s) with a conspicuous, pale, depressed, median lobe, as in *depressa*, this lobe about two and one-half times as long as wide, subtended on either side by obtuse shoulders.

*Habitat*.—Japan, Honshiu.

Holotype, male, Kamikochi, altitude 5,000 feet, July 26, 1939 (*Suenson*).

The nearest ally of the present fly is *Tipula (Oreomyza) depressa* Alexander, likewise from the Japanese Alps, which differs especially in the details of structure of the male hypopygium, as follows: Lateral tergal arms broad, apices entire and truncated; outer dististyle narrower on outer portion; inner dististyle with basal lobe very large and flattened, only a little less extensive than remainder of style, separated from main body of latter by a broadly oval notch; gonapophyses with posterior lobe narrow, at central portion narrower than blackened spines; lobe of eighth sternite shorter and more broadly obtuse at apex, length less than twice greatest width.

NEPHROTOMA ALTICRISTA sp. nov. Plate 1, fig. 8; Plate 3, fig. 34.

General coloration yellow, præscutum with three polished leaden stripes that are very narrowly bordered by brownish black, cephalic end of median stripe paling to reddish; scutellum and postnotum uniformly yellow; antennæ with flagellar segments rather strongly incised; wings subhyaline, stigma medium brown, extreme wing tip vaguely darkened; abdomen with tergites yellow, trivittate with black; terminal three segments black; male hypopygium relatively small; inner dististyle with dorsal crest very high and glabrous.

*Male*.—Length, about 13 to 14 millimeters; wing, 11 to 12; antenna, about 4.8 to 5.

Frontal prolongation of head yellow, outer end of dorsal surface, together with the elongate nasus, darkened; palpi pale brownish yellow. Antennæ relatively long; basal three segments yellow; fourth segment pale brown, base a little darker; succeeding segments black; flagellar segments rather strongly incised, subequal in length to longest verticils. Head orange, vertex with a delicate brown median line extending from summit of vertical tubercle to occiput; occipital band concolorous with remainder of head.

Pronotum orange. Mesonotal præscutum orange yellow, with three polished lead-colored stripes that are very narrowly bordered by brownish black; cephalic third of median stripe paling to reddish; an opaque brownish-black spot laterad of anterior end of outer præscutal stripe; scutum yellow, lobes extensively lead-colored, narrowly bordered by brownish black; scutellum and postnotum uniformly orange yellow. Pleura yellow, scarcely variegated by areas of more orange yellow. Halteres with stem pale brown or brownish yellow, base of knob infuscated, apex paling to obscure yellow. Legs with coxæ and trochanters yellow; femora obscure yellow, tips very narrowly, vaguely darkened; tibiæ obscure yellow; tarsi passing into black. Wings (Plate 1, fig. 8) subhyaline; stigma medium brown; extreme wing tip vaguely darkened; outer wing veins insensibly seamed with brown; veins dark brown. Stigmal trichia about 30 to 35. Venation: Rs a little longer than basal section of R<sub>5</sub>; cell M<sub>1</sub> variable, from short-petiolate to very narrowly to broadly sessile; m-cu at fork of M or on M<sub>4</sub> shortly beyond origin.

Abdominal tergites yellow, conspicuously trivittate with black; seventh and succeeding segments black, outer appendages pale brown to yellowish brown. Male hypopygium (Plate 3, fig. 34) with tergite, 9*t*, transverse, caudal margin with two submedian rounded lobes that are set with blackened points and separated by a narrow U-shaped notch; outer lobes appearing as pale ears, their cephalic mesal portions with small black spines. Outer dististyle, *od*, with apical fourth narrowed. Inner dististyle, *id*, with beak slender; dorsal crest very high and glabrous. Gonapophyses, *g*, appearing as small pale blades, about twice as long as width at base, tips obtuse. Ædeagus profoundly trifid at apex. Ninth sternite with a small, finger-like, median lobe. Eighth sternite, 8*s*, extensive, sheathing, caudal margin not or scarcely notched, median area pale and membranous, its outline indicated in the figure by dots.

*Habitat*.—China, Szechwan.

Holotype, male, Mount Omei, Shuang Fei Chiao, altitude 3,000 feet, June 14, 1935 (*Graham*). Paratopotypes, 4 males, June 14 to 22, 1935. Type in the United States National Museum.

Allied to *Nephrotoma decrepita* Alexander and *N. pilata* Alexander, differing in the coloration of the body and, especially, in the structure of the male hypopygium. In the present fly the uniformly yellow scutellum and postnotum suffice to distinguish the species from the above-mentioned allies.

*NEPHROTOMA CIRCUMCINCTA* sp. nov. Plate 1, fig. 9.

General coloration yellow, præscutum with four nacreous stripes that are narrowly but completely encircled by velvety black; scutal lobes similarly nacreous, the areas encircled by black; scutellum and postnotum yellow; pleura yellow, weakly variegated by brown areas; wings subhyaline, cell Sc and stigma more darkened; no stigmal trichia; cell  $M_1$  broadly sessile; abdominal tergites yellow, with a very broad, continuous, median, brown stripe, lateral tergal borders and pleural region similarly darkened; sternites yellow.

*Female*.—Length, about 13 millimeters; wing, 12.5.

Frontal prolongation of head yellow; nasus distinct, scarcely darkened but provided with long black setæ; palpi dark brown. Intermediate segments more brownish yellow, terminal segment brownish black. Antennæ with basal three segments yellow, the organ broken beyond this point. Head deep orange, central portion of vertex weakly more infuscated; vertical tubercle low; occipital brand very small, reduced to an equilateral triangle on the occiput itself.

Pronotum conspicuously dark brown on anterior half of scutum and along the lateral margins, broad posterior portion of scutum, entire scutellum, and pretergites yellow. Mesonotal præscutum yellow with four nacreous stripes that are narrowly but completely encircled by velvety black, the two inner margins of the intermediate stripes thus forming a continuous median stripe of twice the width; opposite the anterior ends of the lateral stripes the velvety black area is widely expanded toward the margin, almost reaching it, but the stripe itself is not deflected laterad; suture darkened; scutum with the median area broadly yellow, each lobe occupied by two confluent nacreous areas that are encircled by a common velvety-black ring; scutellum and parascutella testaceous yellow; postnotum



yellow, posterior border vaguely more grayish, this portion on lateral angles provided with microscopic setulæ. Pleura and pleurotergite almost uniformly yellow, anepisternum and ventral sternopleurite, with the meron, weakly darkened. Halteres brownish yellow, knob slightly more darkened. Legs with coxæ and trochanters yellow; femora yellow, extreme tips vaguely more darkened; tibiæ and proximal portion of basitarsi obscure yellow, remainder of tarsi passing into brown. Wings (Plate 1, fig. 9) subhyaline, cell Sc and stigma darker; veins brown. No stigmal setæ except on veins. Venation: Sc<sub>1</sub> weakly preserved; cell M<sub>1</sub> broadly sessile; m-cu joining M<sub>4</sub> just beyond its origin.

Abdominal tergites yellow, with a very broad, continuous, median, brown stripe, lateral borders and pleural region similarly darkened, leaving clear areas of the yellow ground on either side of the midstripe; subterminal segments more uniformly blackened; sternites more uniformly yellow. Ovipositor horn yellow; cerci straight, relatively stout, their ventral margins at base with microscopic setulæ.

*Habitat*.—Assam, Khasi Hills.

Holotype, female, Cherrapunji, altitude 4,000 feet, 1935 (*Sivcar*).

The peculiar coloration of the thoracic notum will readily distinguish the present species from regional allies. In the Oriental fauna it is most like *Nephrotoma whiteheadi* Edwards and a few allied forms in the Malayan region. It is assumed that the nacreous præscutal stripes are normal, but since the unique type specimen is slightly teneral, these areas may change slightly in more fully colored individuals.

**DOLICHOPEZA (OROPEZA) SAUTERI** (Riedel).

*Oropeza sauteri* RIEDEL, Arch. für Naturgesch. pt. A 82 (1917) 114, 115.

Kuliang, Fukien Province, eastern China, 1,500 to 2,500 feet, April 10, 1938; 1,800 to 2,000 feet, May 11 to 30, July 1 to 7, 1937 (*Kellogg*). Hitherto known from Formosa.

**CYLINDROTOMINÆ**

**CYLINDROTOMA ANGUSTIPENNIS** sp. nov. Plate 1, fig. 10.

General coloration pale yellow, head and thorax conspicuously patterned with black, including three nearly confluent præscutal stripes; knobs of halteres blackened; legs black, femoral bases restrictedly pale; wings narrow with a weak dusky tinge, the narrow stigma brownish black; Sc relatively short, Sc<sub>2</sub> ending

opposite fork of Rs; Rs long, nearly straight; abdomen, including ovipositor, black.

*Female*.—Length, about 11 millimeters; wing, 9.5.

Rostrum yellow, weakly darkened above; palpi black. Antennæ black, proximal end of scape paler; flagellar segments subcylindrical, outer segments slenderer. Head light yellow, posterior vertex and occiput black, sending a narrow arm laterad and beneath onto genæ, posterior orbits remaining broadly pale.

Pronotum with scutum black, scutellum yellow. Mesonotal præscutum very pale yellow or whitish yellow, conspicuously patterned with three black stripes that are virtually confluent in front, leaving narrow, pale interspaces behind; scutum pale yellow, each lobe with a conspicuous black area on mesal portion; scutellum pale yellow; mediotergite pale yellow, posterior third brownish black. Pleura pale yellow, conspicuously variegated with black on the ventral sternopleurite, ventral anepisternum, and extreme ventral edge of pleurotergite. Halteres with stem brownish yellow, knob blackened. Legs with coxæ yellow, fore pair of coxæ weakly infuscated on basal half; trochanters yellow; remainder of legs black, with about basal third of femora obscure yellow. Wings (Plate 1, fig. 10) with a weak dusky tinge, the narrow stigma brownish black; veins beyond level of outer end of cell 1st  $M_2$  very narrowly bordered with dusky, so the veins appear unusually stout; veins brownish black. Wings narrow compared with *distinctissima* or *japonica*. Venation: Rs long, nearly straight, not or scarcely arcuated at origin, nearly twice length of  $R_{2+3}$ ;  $Sc_2$  ending opposite fork of Rs; cell  $M_1$  short-petiolate; m-cu at near one-third length of cell 1st  $M_2$ .

Abdomen black, lateral margins of basal tergite pale; pleural membrane yellow; ovipositor with valves intensely black.

*Habitat*.—China, Szechwan.

Holotype, female, Mount Omei, Yien Lao Dong Temple, altitude 6,500 feet, August 5, 1935 (*Graham*); United States National Museum.

In its general coloration the present species is most similar to *Cylindrotoma distinctissima* (Meigen) of the western Palæarctic Region, or *C. japonica* Alexander of the eastern Palæarctic Region, differing in the narrow wings, with blackened veins, and in the blackened legs. *C. nigripes* Alexander has the general coloration black-pruinose, with the yellow areas very restricted; wings with Rs arcuated at origin and with  $Sc$  long,

Sc<sub>2</sub> ending some distance beyond the level of r-m. As previously indicated, I am now doubtful that the antennæ associated with the type specimen of *nigripes* really belong to this fly. In the type the antennæ were detached and the association cannot be finally confirmed or refuted.

## LIMONIINÆ

## LIMONIINI

**LIMONIA (DICRANOMYIA) POLI** sp. nov. Plate 1, fig. 11; Plate 3, fig. 35.

*Limonia (Dicranomyia) fullowayi* ALEXANDER, Phil. Jour. Sci. 63 (1937) 373; *nee fullowayi* ALEXANDER, Can. Ent. 47 (1915) 79, 80.

*Limonia (Dicranomyia) fullowayi* ALEXANDER, Notes d'Ent. Chinoise (5) 4 (1937) 70.

*Male*.—Length, about 4.5 to 5.5 millimeters; wing, 5 to 6.

Rostrum black, gray-pruinose; palpi black. Antennæ black throughout; flagellar segments oval. Head dark gray.

Mesonotum chiefly dark gray, præscutum with a conspicuous brown median stripe; scutal lobes with their centers similarly darkened. Pleura dark gray. Halteres pale, knobs weakly infumed. Legs with coxæ dark basally, paling at outer ends; trochanters yellow; femora obscure yellow, tips weakly darkened; tibiæ and tarsi pale brown, outer tarsal segments a little darker. Wings (Plate 1, fig. 11) subhyaline, with a restricted spotted gray or brownish-gray pattern, including a more or less abundant series of small dots in cell C and the usual two spots in cell 1st A adjoining vein 2d A. Venation: Cell 1st M<sub>2</sub> subequal in length to longest vein beyond it; m-cu close to fork of M.

Abdominal tergites brownish black, basal and intermediate sternites pale brown or yellowish brown; hypopygium black. Male hypopygium (Plate 3, fig. 35) with tergite, 9t, rather deeply and narrowly notched medially. Ventral dististyle, *vd*, about one and one-half the total area of basistyle, *b*; rostral prolongation unusually long and slender, nearly straight; a single rostral spine, long and straight, placed about its own length from apex of prolongation. Gonapophyses, *g*, with mesal-apical lobe bidentate at apex.

*Habitat*.—Japan and China.

Holotype, male, Mount Omei, Szechwan, China, altitude 4,000 feet, July 14, 1931 (*Franck*). Paratypes, numerous specimens. Kuling, northern Kiangsi, China, altitude 3,250 feet, July 31 to August 18, 1935 (*Piel*), in Musée Heude, Shanghai; Hong San, southeastern Kiangsi, altitude 2,500 feet, July 15, 1936

(Gressitt); Mount Hakone, Honshiu, Japan, altitude 2,300 feet, July 12, 1923 (*Esaki*); Shibuya, near Komaba, Tokyo, Japan, June 7, 1920 (*Machida*); Mount Kirishima, Kiushiu, Japan, altitude 2,500 feet, May 3, 1929 (*Issiki*).

An unfortunate confusion of names concerning one of the commonest and most wide-spread crane flies in eastern Asia has resulted from insufficient knowledge concerning the identity of *Limonia* (*Dicranomyia*) *fullowayi* (Alexander). Recent accessions of material from the Caroline and other Pacific islands has shown that the fly identified as *fullowayi* as it occurs in Japan and China is not this species but an undescribed form most nearly allied to *L. (D.) punctulata* (de Meijere) of the Greater Sunda Islands, yet amply distinct. This latter fly has the spine of the rostrum of the male hypopygium strongly curved at tip and the armature of the gonapophyses quite distinct.

**LIMONIA (DICRANOMYIA) RETROGRADA** sp. nov. Plate 1, fig. 12; Plate 3, fig. 36.

General coloration brownish gray, præscutum with a conspicuous, brownish-black, median stripe; antennæ black throughout; halteres with knobs black; wings yellowish, oval stigma dark brown;  $Sc_1$  terminating opposite origin of  $R_s$ ,  $Sc_1$  long; male hypopygium relatively large and complex in structure; tergite narrowly transverse, with a median tubercle bearing about six long setæ; basistyle with ventromesal lobe large, boat-shaped; ventral dististyle small, white, its rostral prolongation abruptly blackened, long and slender, gradually narrowed outwardly; rostral spines two, placed on basal third of prolongation; ædeagus narrow.

*Male*.—Length, about 7.5 millimeters; wing, 8.

Rostrum and palpi dark brown. Antennæ black throughout; flagellar segments oval. Head brownish gray; anterior vertex relatively wide.

Pronotum brown above, paler laterally. Mesonotal præscutum brownish gray, with a conspicuous, brownish-black, median stripe, the lateral stripes scarcely indicated; posterior sclerites of notum brownish gray. Pleura heavily gray-pruinose. Halteres with stem obscure yellow, knob black. Legs with coxæ yellow, fore pair of coxæ weakly darkened basally; trochanters yellow; femora brownish yellow, clearer basally, tips narrowly brownish black; tibiæ and basitarsi brown, tips narrowly blackened; remainder of tarsi black. Wings (Plate 1, fig. 12) with a yellowish tinge, the oval stigma dark brown, conspicuous; veins

dark brown. Venation:  $Sc_1$  ending opposite origin of  $R_s$ ,  $Sc_2$  far from its tip; free tip of  $Sc_2$  and  $R_2$  in approximate transverse alignment; m-cu at fork of  $M$ .

Abdominal tergites blackened, paler laterally, caudal borders more narrowly pale; basal sternites yellow, outer segments darker; hypopygium black, outer lobe of ventral dististyle conspicuously white. Male hypopygium (Plate 3, fig. 36) with tergite,  $9t$ , very narrowly transverse, caudal margin gently emarginate, lateral lobes thus very low but indicated by thickenings provided with setæ; a smaller median tubercle bearing six or seven very long setæ. Basistyle,  $b$ , entirely black, very small, its outer face with unusually few setæ; ventromesal lobe very large and conspicuous, boat-shaped. Dorsal dististyle a gently curved blackened rod, tip acute. Ventral dististyle,  $vd$ , small, its area much less than that of the total basistyle; outer whitened lobe oval; rostral prolongation and its basal enlargement abruptly black; prolongation a slender blade that very gradually narrows outwardly, tip acute, along margin with five or six equally spaced setæ; rostral spines broken in the unique type, only their bases remaining, placed close together on the basal third of the prolongation, directed outwardly; basal enlargement of prolongation with conspicuous pencils and brushes of elongate setæ. Gonapophyses,  $g$ , with mesal-apical lobe gently curved at tip.  $\mathcal{A}$ edeagus,  $a$ , unusually slender, constricted at and before midlength, distal end very weakly expanded, terminating in two parallel lobes that are separated by a linear slit.

*Habitat*.—China, Szechwan.

Holotype, male, Tatsienlu, October 31, 1938 (Franck); caught on table, all its movements being either backward or to one side, not forward.

*Limonia (Dicranomyia) retrograda* is still another of the now numerous Asiatic species of the subgenus having a complex male hypopygium. It differs from all other generally similar regional species, as *L. (D.) gracilirostris* Alexander, *L. (D.) grahamiana* Alexander, *L. (D.) tseni* Alexander, and *L. (D.) veterinosa* Alexander, in the structure of the male hypopygium. The most similar of these species, based on the structure of the hypopygium, is *gracilirostris*, which has this organ quite distinct in every detail. The habit of walking of the adult fly, as described by Franck, is relatively common among members of the various subgenera of *Limonia*.

**LIMONIA (LIMONIA) NEONEBULOSA Alexander.**

*Dicranomyia nebulosa* ALEXANDER, Can. Ent. 45 (1913) 203-205, pre-occupied.

*Limonia neonebulosa* ALEXANDER, Phil. Jour. Sci. 24 (1924) 555, 556.

China, Chekiang: Hills south of Ningpo, halfway to Nimrod Sound, May 1 to 4, 1925 (*Suenson*); Szechwan, Mount Omei, altitude 4,000 feet, August 13, 1931 (*Franck*). Wide-spread in Japan and China.

**HELIUS (HELIUS) NIPPONENSIS (Alexander).**

*Rhamphidia nipponensis* ALEXANDER, Can. Ent. 46 (1914) 207-209.

China, Chekiang: Hills south of Ningpo, halfway to Nimrod Sound, May 1, 1925 (*Suenson*). One male, Hang-chow, April 28, 1924 (*Suenson*). Hitherto known from Japan.

**HELIUS (HELIUS) PLUTO Alexander.**

*Helius (Helius) pluto* ALEXANDER, Phil. Jour. Sci. 49 (1932) 118, 119.

China, Szechwan, Kwanhsien, altitude 3,500 feet, July 25 to August 1, 1937; Pehluting, altitude 6,000 feet, July 9, 1937 (*Franck*). Not included in the Wu Catalogue of Chinese Diptera (1940).

**ORIMARGA (ORIMARGA) FOKIENSIS sp. nov. Plate 1, fig. 13; Plate 4, fig. 37.**

General coloration dark plumbeous gray; antennæ and legs black; halteres with knob weakly darkened; wings relatively broad, brownish gray, stigmal region very narrowly darker brown; macrotrichia of veins beyond cord sparse;  $Sc_1$  ending about opposite four-fifths length of  $Rs$ ,  $Sc_2$  at its tip, free tip of the latter atrophied;  $R_{1,2}$  and  $R_2$  subequal in length, shorter than  $R_{2,3}$ ; anal cells large; abdomen brownish black; male hypopygium with outer dististyle unusually short, apex blackened, shorter than pendant free tip of inner style; gonapophyses very slender, pale, narrowed to an acute point.

*Male*.—Length, about 6 millimeters; wing, 5.

*Female*.—Length, about 6.5 millimeters; wing, 5.3.

Rostrum and palpi black. Antennæ black throughout. Head black, heavily gray-pruinose, broad anterior vertex more silvery.

Mesonotal præscutum dark plumbeous gray, humeral and lateral portions somewhat clearer gray; posterior sclerites of notum gray, posterior border of scutellum narrowly more brownish yellow. Pleura black, pruinose, posterior sclerites and dorso-pleural membrane somewhat brightened. Halteres with stem

pale, knob weakly darkened. Legs with coxæ light brown, fore pair of coxæ darker; trochanters brown; remainder of legs black. Wings (Plate 1, fig. 13) relatively broad, especially in male, brownish gray; stigmal region very narrowly darker brown; prearcular field and basal portions of costal region more whitened; veins pale brown, those in prearcular field still lighter. Macrotrichia of veins beyond cord sparse, there being scattered series on distal sections of veins  $R_3$  to  $M_3$ , inclusive; costal fringe moderately long and abundant. Venation:  $Sc_1$  ending about opposite four-fifths length of  $R_s$ ,  $Sc_2$  at its tip, free tip of latter atrophied;  $R_{1+2}$  and  $R_2$  subequal in length, both shorter than  $R_{2+3}$ ; basal section of  $R_{4+5}$  very strongly arcuated to angulated; petiole of cell  $M_3$  varying from about one-half to more than two-thirds length of cell; anal cells very large and ample, due to the unusually broad wings. The type male shows an adventitious crossvein in cell  $R_3$  of the right wing, in direct transverse alignment with r-m and immediately distad of  $R_2$ .

Abdomen brownish black, hypopygium a trifle brighter. Male hypopygium (Plate 4, fig. 37) with dististyle, *d*, unusually short, apex of outer style shorter than free portion of inner style, narrowly blackened and terminating in a short, acute point; inner style with its free apex pendant, with numerous long setæ. Basistyle, *b*, without lobes of any type. Phallosome with apophyses, *g*, very slender, pale, apex narrowed to an acute point.

*Habitat*.—China, Fukien.

Holotype, male, Kuliang, altitude 1,800 to 2,000 feet, June 1 to 3, 1937 (*Kellogg*). Allotopotype, female, with the type.

*Orimarga (Orimarga) fokiensis* is closest to species such as *O. (O.) griseipennis* Alexander (Formosa) and *O. (O.) gymnoneura* Alexander (Formosa), differing from both in the shape of the wing and in the details of venation. In wing shape the present fly is about intermediate between the two species mentioned, with the venational details correspondingly modified. The male of *griseipennis* is still unknown, but the hypopygium of *gymnoneura* is quite different from that of the present fly.

*DICRANOPTYCHA SUENSONIANA* sp. nov. Plate 1, fig. 14; Plate 4, fig. 38.

General coloration of mesonotal præscutum dark brown, the usual three stripes confluent to form a discal area; posterior sclerites of notum and pleura pruinose; intermediate flagellar segments weakly bicolored; halteres pale yellow; legs yellow,

extreme tips of femora, tibiæ, and basitarsi blackened; wings brownish yellow, costal border conspicuously light yellow; veins dark brown, veins in prearcular and costal fields light yellow; costal fringe short; basal section of  $R_{4+5}$  almost in direct longitudinal alignment with  $R_s$ ; abdomen black, sparsely pruinose, hypopygium abruptly yellow; male hypopygium with outer dististyle flattened, very densely covered with setæ, lower surface before apical spine with blackened tubercles and short triangular spines; phallosome appearing as two pairs of elongate elements, longest pair appearing as acutely pointed blades, before apex on outer margin with a tiny spine.

*Male*.—Length, about 8.5 to 9 millimeters; wing, 10 to 10.5.

*Female*.—Length, about 9 to 10 millimeters; wing, 9.5 to 10.5.

Rostrum black, pruinose; palpi black. Antennæ with basal segments yellow, intermediate and outer segments weakly bicolored, incisures and especially bases of segments yellow, central portion infuscated; outer segments more uniformly infuscated; flagellar segments subcylindrical, passing into elongate-oval. Head black, heavily gray-pruinose; anterior vertex a little less than twice diameter of scape.

Pronotum gray. Mesonotum chiefly dark brown, heavily pruinose, especially posterior sclerites of notum; præscutum with disc almost occupied by a subnitidous dark-brown shield, the three usual stripes being confluent; pseudosutural foveæ black. Pleura heavily gray-pruinose. Halteres pale yellow. Legs with coxæ yellow, weakly pruinose; trochanters yellow; femora, tibiæ, and basitarsi yellow, extreme tips of segments blackened; remainder of tarsi passing into brownish black. Wings (Plate 1, fig. 14) brownish yellow, costal border conspicuously light yellow; veins dark brown, veins in prearcular and costal fields light yellow. Costal fringe short in both sexes. Venation: Basal section of  $R_{4+5}$  almost in direct alignment with  $R_s$ ,  $R_{2+3}$  erect at origin;  $R_s$  about one and one-half as long as cell 1st  $M_2$ .

Abdomen black, sparsely pruinose, hypopygium abruptly yellow. Male hypopygium (Plate 4, fig. 38) with interbases appearing as slender, pale rods, a little expanded distally, their extreme tips obtuse and decurved. Outer dististyle, *od*, narrowed to acute blackened apical spine, rather broadly flattened, entire outer surface with very numerous erect setæ, lateral and ventral portions with conspicuous, erect, blackened tubercles



and short triangular spines. Inner dististyle, *id*, longer; gradually narrowed to obtuse tip. Phallosome consisting of two pairs of elongate elements, the longest pair appearing as flattened blades that diverge gradually, narrowed to the acute spinous tips, before apex on outer margin with a very tiny spine. Shorter apophyses, *g*, with apex bent mesad at a right angle into long, very pale points that bear numerous long pale setæ.

*Habitat*.—Japan, Honshiu.

Holotype, male, Kawaguchi, Fuji Lakes District, altitude 2,800 feet, August 11, 1939 (*Suenson*). Allotopotype, female. Paratopotypes, 1 male, 4 females.

I take great pleasure in dedicating this distinct fly to the collector, Mr. E. Suenson, of Shanghai, to whom I am greatly indebted for many Tipulidæ from Japan and eastern China. *Dicranoptycha suensoniana* is closest to *D. prolongata* Alexander, of northern Korea, and to *D. venosa* Alexander, of Saghalien, differing conspicuously from both in the body coloration and especially in the structure of the male hypopygium.

DICRANOPTYCHA MALABARICA sp. nov. Plate 1, fig. 15; Plate 4, fig. 39.

General coloration of thorax brownish yellow, pleura clearer yellow; antennæ obscure yellow, outer segments passing into brown; legs yellow, extreme tips of femora, tibiæ, and basitarsi blackened; wings brownish yellow, prearcular and costal fields clear yellow; veins deep yellow to brownish yellow; costal fringe of moderate length, dense;  $R_{1+2}$  relatively long, exceeding *m-cu* in length; abdomen brownish yellow with a narrow, brownish-black, subterminal ring in male, this ring chiefly involving the eighth tergite; male hypopygium with outer dististyle relatively weak, with delicate setulæ and appressed spinous points; apex of inner dististyle dilated; phallosome a complex mass consisting of a dorsal and a ventral portion separated from one another by a distinct notch.

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

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

Rostrum obscure yellow; palpi light brown. Antennæ obscure yellow, outer segments passing into brown. Head brownish yellow to light brown, more pruinose beneath; anterior vertex somewhat wider than diameter of scape.

Mesonotum brownish yellow, surface, especially of præscutum, subnitidous. Pleura clearer yellow. Halteres pale yellow throughout. Legs with coxæ and trochanters yellow; femora, tibiæ, and basitarsi light yellow, tips very narrowly but con-

spicuously blackened; remaining tarsal segments passing into brown. Wings (Plate 1, fig. 15) with a brownish-yellow tinge, prearcular and costal fields clear yellow; veins deep yellow to brownish yellow. Costal fringe (male) dense and of moderate length. Venation: Rs subequal to or shorter than cell 1st  $M_2$ ;  $R_{1+2}$  relatively long, exceeding m-cu in length.

Abdomen brownish yellow, sternites somewhat clearer; in male eighth segment and adjoining portions of seventh and ninth brownish black to form a narrow subterminal ring; hypopygium yellow. Male hypopygium (Plate 4, fig. 39) with outer dististyle, *od*, relatively small and slender, with abundant short, erect setulæ and a few scattered appressed spinous points. Inner dististyle, *id*, much longer, at apex dilated into a discoid head, the whole surface with abundant coarse setæ from conspicuous punctures. Interbase, *i*, a pale, flattened blade, only slightly expanded at distal end, base greatly prolonged to opposite cephalic end of phallosome; apex of interbase with a slightly projecting point. Phallosome, *p*, massive, apex obtuse and provided with abundant delicate setulæ; apex with a broadly circular orifice, margin darker and more sclerotized, in central portion with two small teeth; a shorter portion of phallosome weakly bilobed at apex.

*Habitat*.—South India, Malabar.

Holotype, male, Walayar Forest, altitude 2,000 feet, August 8, 1938 (*Susai Nathan*). Allotopotype, female, in copula with type. Paratopotypes, 30 males and females, altitude 2,000 feet. August 8, 1938, altitude 1,500 feet, September 9, 1938; paratype. 1 female, Siruvani, Coimbatore District, altitude 3,000 feet. August 11, 1938 (*Susai Nathan*).

*Dicranoptycha malabarica* is the first species of the genus to be described from India. There are several members of *Dicranoptycha* in tropical Africa and numerous others in China and Japan, so the occurrence in southern India was not unexpected.

#### PEDICIINI

DICRANOTA (EUDICRANOTA) RADIALIS sp. nov. Plate 1, fig. 16.

General coloration yellow; antennæ 15-segmented, flagellar segments short and crowded, especially the basal ones; mesonotal præscutum and scutal lobes caseous; tips of tibiæ and proximal two tarsal segments narrowly dark brown; wings whitish subhyaline, very sparsely patterned with brown, appearing as small and narrow seams on certain of the veins; Rs long, angulated at origin; a supernumerary crossvein in cell

$R_1$  at near one-third length of  $R_s$ , additional to usual crossvein lying beyond midlength of cell;  $R_2$  very oblique, ending in costa or barely connected at its tip with  $R_1$ ; m-cu just beyond fork of  $M$ .

*Female*.—Length, about 7 millimeters; wing, 6.8.

Rostrum and palpi yellow. Antennæ short, yellow throughout, 15-segmented; flagellar segments short and crowded, basal segments not narrowed apically and thus joined broadly with succeeding segments; outer segments more oval, with longer verticils. Head pale yellow.

Pronotum pale yellow. Mesonotal præscutum and scutal lobes pale grayish brown or caseous, median region of scutum, scutellum, and postnotum yellow; setigerous punctures of præscutum conspicuous. Pleura pale yellow. Halteres yellow. Legs relatively stout, yellow, tips of tibiæ and proximal two tarsal segments narrowly dark brown, remainder of tarsi uniformly dark brown. Wings (Plate 1, fig. 16) whitish subhyaline, very sparsely patterned with brown, appearing as small and narrow seams on  $Sc_2$ , origin of  $R_s$ , along both supernumerary crossveins in cell  $R_1$ , along  $R_2$ , and less evidently along cord and outer end of cell 1st  $M_2$ ; a distinct grayish marginal cloud at end of vein  $R_3$ ; veins beyond cord chiefly dark brown, veins basad of cord and in costal region yellow except where traversing dark areas. Venation:  $Sc_2$  lying far basad, distance between arculus and vein only equal to cell 1st  $M_2$ ;  $R_s$  long, angulated and sometimes spurred at origin, with a strong supernumerary crossvein at near one-third its length in cell  $R_1$ , as well as the usual "*Dicranota*" crossvein farther distad, about opposite fork of  $R_{4+5}$ ; a weaker crossvein at near one-third length of cell  $R_3$ ; vein  $R_2$  very oblique, ending in costa beyond tip of  $R_1$  or barely fused with this vein; vein  $R_3$  unusually short and upcurved at its outer end, a little exceeding twice length of vein  $R_2$ ; cell  $M_1$  a little exceeding its petiole; m-cu shortly beyond fork of  $M$ .

Abdomen obscure yellow; cerci long and powerful, yellowish horn-colored.

*Habitat*.—Manchuria, Kirin.

Holotype, female, Kaolingtzu, June 20, 1940 (*Weymann*).

*Dicranota (Eudicranota) radialis* is closest to *D. (E.) perdistincta* Alexander, of northern Korea. I must regard the strong crossvein connecting vein  $R_1$  with  $R_s$  as a supernumerary rather than an adventitious element and thus furnishing a marked

specific character for the separation of the two species. Whether the further crossvein in cell  $R_3$  is also supernumerary cannot be affirmed. The larger size, more fully developed wings, and caseous color of the præscutum give a distinctive appearance to the present fly. In *perdistincta*, and presumably also in *radialis*, the halteres of the female are shorter than those of the male.

## HEXATOMINI

LIMNOPHILA (ELÆOPHILA) LATINIGRA sp. nov. Plate 1, fig. 17; Plate 4, fig. 40.

General coloration gray, præscutum with six broken series of brown spots and dots; antennal flagellum bicolored; pleura gray, conspicuously patterned with dark brown; base of knob of haltere whitish; femora yellow, tips very broadly black, including approximately one-fifth total length of segment; wings whitish, with a heavy brown spotted and dotted pattern; abdomen brownish black, hypopygium brightened; male hypopygium with apical portion of outer dististyle almost central in position, apex a right-angled spine subtended on either side by conspicuous lobes; ædeagus very small, on either side with a small, acute, triangular point.

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

Rostrum black, sparsely pruinose; palpi black. Antennæ with basal two segments black, sparsely pruinose; succeeding segments bicolored, their bases black, the apical half or less yellow, the amount of latter decreasing on outer segments; terminal segments uniformly black; basal flagellar segments elongate, outer segments shorter. Head gray, center of vertex chiefly dark brown.

Thoracic notum gray, variegated with short brown dashes, including a central dash on pronotum and six broken series on præscutum, representing the usual stripes and interspaces; tuberculate pits and pseudosutural foveæ black; scutum gray, each lobe with two separate dark-brown areas; scutellum narrowly transverse, dark gray, parascutella darker; mediotergite gray, lined with darker. Pleura gray, conspicuously patterned with dark brown, including two irregular and partly broken longitudinal stripes. Halteres with base of stem yellow, remainder brown; base of knob whitish, apex dark brown. Legs with coxæ dark brown, gray-pruinose; trochanters black; femora yellow, tips broadly and abruptly jet black, the amount involving about one-fifth the total length of segment; tibiæ yellow, tips narrowly blackened; tarsi obscure yellow, apices of

basitarsi and all of outer segments darkened. Wings (Plate 1, fig. 17) only moderately widened in male, broadest at or just before midlength; ground color whitish, extreme wing base more yellowed; a very abundant dark-brown spotted and dotted pattern; major dark areas at arculus; as a narrow complete band at level of origin of Rs and supernumerary crossvein, ending at outer end of cell 2d A a short distance before vein 2A; a dark V with the point on the anterior cord, the arms at fork of Sc and the stigma; wing tip darkened, broken by abundant small dots; all cells with abundant small brown dots; veins yellow, infumated in darkened areas. Venation: Sc<sub>1</sub> ending just before fork of Rs, Sc<sub>2</sub> at its tip; R<sub>2</sub> subequal to R<sub>2+3</sub>; R<sub>2+3+4</sub> in longitudinal alignment with Rs; m-cu about two-thirds its length beyond fork of M.

Abdomen brownish black, sparsely pruinose; hypopygium brightened. Male hypopygium (Plate 4, fig. 40) with outer dististyle, *od*, broad, apical point almost central in position, at apex strongly curved to a right angle; outer shoulder an acutely pointed flange, inner lobe more obtusely rounded; setæ on face of style sparse. Inner dististyle, *id*, pale, subobtuse at apex. Phallosome, *p*, with ædeagus very small, subtended on either side by a small, acute, triangular point.

*Habitat*.—China, Fukien.

Holotype, male, Kuliang, altitude 1,500 to 2,500 feet, April 6 to 13, 1938 (*Kellogg*).

*Limnophila (Elæophila) latinigra* is most similar to species such as *L. (E.) dietziana* Alexander and *L. (E.) suenisoni* Alexander, differing conspicuously in the very broad blackened femoral tips and, especially, in the distinctive structure of the male hypopygium.

LIMNOPHILA (ELÆOPHILA) SIMILISSIMA sp. nov. Plate 4. fig. 41.

General coloration gray, præscutum variegated with short, dark-brown lines; basal flagellar segments yellow; femora yellow, tips broadly blackened, on outer face close to apex more reddish brown; wings (male) dilated, widest before tip of vein 2d A; whitish, heavily spotted and dotted with brown; male hypopygium with outer dististyle narrow, subtended on outer face by a relatively slender lobe, its tip narrowly obtuse; ædeagus with subtending lobes low and obtuse.

*Male*.—Length, about 5.5 millimeters; wing, 6.2.

Rostrum and palpi black. Antennæ with scape and pedicel black; basal flagellar segments uniformly yellow, outer segments

darker; flagellar segments oval. Head brownish gray, sparsely patterned with darker.

Pronotum gray, with a delicate median brown line. Mesonotal præscutum gray with short, dark-brown lines, representing the usual stripes, with additional dashes on posterior interspaces; scutum gray, each lobe with two brown areas; scutellum gray, with a narrow brown median line that likewise includes the central area of scutum; postnotum gray, mediotergite darkened behind and on sides. Pleura conspicuously variegated with dark brown on a gray ground. Halteres dark brown, base of stem restrictedly pale, extreme tip of stem slightly brightened. Legs with coxæ gray; trochanters blackish; femora yellow, tips broadly blackened, outer face close to apex more reddish; tibiæ yellow, tips very weakly infuscated; basal tarsal segments yellow, extreme tips vaguely darkened; outer tarsal segments uniformly darkened. Wings of male dilated, widest just basad of vein 2d A; ground color whitish, heavily patterned with brown spots and dots; major brown areas at and just beyond arculus; as a narrow broken band at level of origin of Rs and supernumerary crossvein, interrupted in cell Cu; a large V-shaped area with arms at fork of Sc and stigma, converging to a point behind, enclosing a very narrow ground area between branches; wing tip broadly and almost solidly darkened; numerous small dots in interspaces; veins pale, brown in clouded areas. Venation: Sc<sub>1</sub> ending a short distance beyond fork of Rs, Sc<sub>2</sub> at its tip; R<sub>2,3,4</sub> in longitudinal alignment with Rs, the latter square and short-spurred at origin; m-cu at near midlength of the small cell 1st M<sub>2</sub>.

Abdomen dark brown, hypopygium a trifle brightened. Male hypopygium (Plate 4, fig. 41) with outer dististyle, *od*, narrow, subtended on outer face by a relatively slender lobe or flange, apex narrowly obtuse; apical spine gently curved to acute tip, on inner face gradually sloping. Inner dististyle, *id*, entirely pale. Phallosome, *p*, with ædeagus relatively large and conspicuous, lateral subtending lobes low and obtuse.

*Habitat*.—China, Szechwan.

Holotype, male, Mount Omei, Flying Bridges, altitude 3,000 feet, June 1, 1938 (*Tsen*).

*Limnophila (Elæophila) similissima* is very like the Japanese *L. (E.) dietziana* Alexander, differing in the nature of the wing and leg pattern and especially in the details of structure of the male hypopygium. It is quite distinct from the only

other species of *Elæophila* hitherto made known from western China.

**LIMNOPHILA TRANSITORIA** sp. nov. Plate 1, fig. 18; Plate 4, fig. 42.

Allied to *nemoralis*; general coloration light gray, præscutum with very slightly darker-gray stripes; basal antennal segments pale; wings with a strong brownish-yellow tinge, stigmal region very slightly darker brown; cell  $M_1$  lacking; abdominal tergites light brown, subterminal segments forming a blackened ring; male hypopygium with interbases only feebly expanded at outer ends.

*Male*.—Length, about 5 to 6 millimeters; wing, 5.8 to 6.8.

Rostrum brown, pruinose; palpi black. Antennæ short; scape pruinose; succeeding two or three segments brownish yellow, outer segments passing into brown; flagellar segments elongate, verticils long and conspicuous. Head light gray; anterior vertex broad.

Pronotal scutellum yellow. Thoracic dorsum light gray, præscutal stripes very slightly darker gray, only slightly differentiated against ground. Pleura chiefly pale, gray-pruinose, ventral sternopleurite and dorsopleural region darker gray. Halteres yellow. Legs with coxæ testaceous yellow to brownish yellow; trochanters yellow; femora yellowish brown, slightly darkened on outer portion; remainder of legs obscure yellow to brownish yellow, terminal tarsal segments blackened. Wings (Plate 1, fig. 18) with a strong brownish-yellow tinge, stigmal region very slightly darker brown; veins brownish yellow to very pale brown. Venation: Cell  $M_1$  lost by fusion to margin of veins  $M_1$  and  $M_2$ ; m-cu beyond fork of  $M$ , the distance variable, in cases only a little less than vein itself.

Abdominal tergites light brown, sternites obscure yellow or brownish yellow; subterminal segments, including seventh and eighth, forming a blackened ring; hypopygium yellow. Male hypopygium (Plate 4, fig. 42) with outer dististyle, *od*, unequally bifid at apex, inner or lower tooth longer and stouter. Interbase, *i*, only feebly expanded at outer end.

*Habitat*.—Japan, Honshiu.

Holotype, male, Kamikochi, altitude 5,000 feet, June 19, 1939 (Suenson). Paratopotypes, 4 males, June 18 and 19, 1939.

Among the described regional species of the *nemoralis* group the present fly is closest to *Limnophila subnemoralis* Alexander, of Japan. The described species of the group, including the western Palæarctic *L. adjuncta* Walker, and *L. nemoralis*

(Meigen) and its described races, *minuscula* Edwards, *separata* Walker, and *quadrata* Edwards; the eastern Palearctic and Oriental *L. inæqualis* Alexander, *L. nesonemoralis* Alexander, and *L. subnemoralis* Alexander; and the Nearctic *L. brevifurca* Osten Sacken and *L. occidenta* Alexander, all have cell  $\bar{M}_1$  present but in cases very small and with abnormal individuals showing the cell lost by fusion of veins in one or even in both wings. The present series indicates that the character of loss of cell  $\bar{M}_1$  in the present species is a constant one. The case is comparable to that found in *Pseudclimnophila noveboracensis* (Alexander) and others where cell  $\bar{M}_1$  is lacking, although it is present in numerous allied species of the genus.

**HEXATOMA (ERIOCERA) COOMAN! sp. nov. Plate 1, fig. 19.**

Belongs to the *chirothecata* group; mesonotal præscutum dark brown, with four shiny blue-black stripes that are narrowly margined with velvety black; posterior sclerites of notum and abdomen black; halteres and legs black throughout; wings with a strong brown tinge, costal border with a more yellowish cast;  $R_{1+2}$  long; cells  $\bar{M}_1$  short; m-cu at near midlength of the small cell 1st  $\bar{M}_2$ .

*Male*.—Length, about 13 millimeters; wing, 10.

Rostrum black, sparsely pruinose; palpi black. Antennæ with scape and pedicel black; flagellum broken. Head black, very sparsely pruinose; anterior vertex wide, approximately four times diameter of scape.

Pronotum black, sparsely pruinose. Mesonotal præscutum dark brown with four shiny blue-black stripes that are narrowly margined with velvety black, pruinose portions with long, black setæ; posterior sclerites of notum black, surface subnitidous. Pleura black, surface pruinose, opaque; dorsopleural membrane dark. Halteres black throughout. Legs with coxæ black-pruinose; trochanters black; remainder of legs black; claws (male) with a strong basal tooth. Wings (Plate 1, fig. 19) with a strong brown tinge, base and costal region more suffused, with a yellowish cast especially in cells C and Sc; stigma lacking; veins brown. Outer radial veins with numerous trichia; outer branches of M without trichia except on  $\bar{M}_1$  and  $\bar{M}_2$ . Venation: Sc long,  $Sc_1$  ending shortly beyond  $R_2$ ,  $Sc_2$  far from its tip, lying just before fork of  $R_{2+3+4}$ ;  $R_{1+2}$  long, approximately one-half  $R_5$ ;  $R_{2+3+4}$  long, nearly twice basal section of  $R_5$ ; outer medial veins very delicate and faint; cell  $\bar{M}_1$  small, only about one-half as long as its petiole, fork asymmetrical, with  $\bar{M}_1$



arcuated,  $M_2$  in longitudinal alignment with  $M_{1,2}$ ; cell 1st  $M_2$  relatively small, subequal in length to vein  $M_4$  beyond it, m-cu at near middle of its length.

Abdomen, including hypopygium, polished black.

*Habitat*.—French Indo-China, Tonkin.

Holotype, male, Hoa-binh (*Cooman*); Musée Heude.

This distinct species is named in honor of the collector, Mr. A. de Cooman. By Edwards's key to the Old World species of *Eriocera*<sup>2</sup> the present fly runs to couplet 37, disagreeing with all species in the *chirothecata* group, coming closest to the otherwise entirely distinct *H. (E.) waterstoni* (Edwards), of Macedonia.

**HEXATOMA (ERIOCERA) TONKINENSIS** sp. nov. Plate 1, fig. 20.

Belongs to *pyrrhochroma* group; general coloration of thorax orange, without markings except a small brown spot on dorsal mesepisternum before wing root; antennal scape yellow, pedicel and flagellum black; legs brown, femoral bases restrictedly obscure yellow; wings with a brown tinge, costal field more saturated; stigma small, dark brown; cell  $M_1$  longer than its petiole; m-cu at near one-third length of cell 1st  $M_2$ ; abdomen, including hypopygium, orange.

*Male*.—Length, about 10 millimeters; wing, 11.5 antenna, about 1.8.

Rostrum brownish yellow; palpi black. Antennæ short, 8-segmented; scape yellow, pedicel and flagellum black; flagellar segments elongate, gradually decreasing in length; terminal segment about one-half length of penultimate. Head orange; vertical tubercle low.

Prothorax and mesothorax uniformly deep orange, præscutum glabrous; a single brown spot on extreme dorsal portion of anepisternum in front of wing root. Halteres with stem brownish yellow, knob brownish black. Legs with coxæ orange; trochanters obscure yellow; femora dark brown, bases restrictedly obscure yellow; tibiæ and tarsi dark brown; claws (male) toothed. Wings (Plate 1, fig. 20) narrow, with a brownish tinge, prearcular and costal fields still darker brown; stigma very small and narrow, dark brown; vague dark seams along certain of the veins, including Rs and Cu; cell Sc yellow; veins brown. Abundant macrotrichia on veins beyond cord, except for distal section of  $Cu_1$ . Venation:  $Sc_1$  ending just

<sup>2</sup> Ann. & Mag. Nat. Hist. (9) 8 (1921) 70-78.

beyond fork of  $R_{2+3,4}$ ,  $Sc_2$  some distance from its tip, shortly beyond fork of  $R_s$ ; cell  $M_1$  longer than its petiole; m-cu at near one-third length of cell 1st  $M_2$ , latter about twice as long as wide.

Abdomen, including hypopygium, orange, pleural region vaguely darker.

*Habitat*.—French Indo-China, Tonkin.

Holotype, male, Laokay, August 13, 1934 (*C. Brownell*) Lingnan University.

Most nearly related to *Hexatoma (Eriocera) nigronotata* Alexander, of Mindanao, and to *H. (E.) quadriatrata* Alexander, of southeastern China, differing in the coloration of the body and wings, and in the details of venation. The dark pattern of the mesothorax is here limited to a small brown spot on the dorsal mesepisternum.

#### ERIOPTERINI

GONOMYIA (LIPOPHLEPS) *BLMUCRONATA* sp. nov. Plate 1, fig. 21; Plate 4, fig. 43.

Belongs to the *incompleta* group; antennæ black, relatively elongate, in male segments with a dense, erect, white pubescence but without elongate verticils; mesonotum grayish brown, variegated with yellow on scutellum and median region of scutum; posterior pleurites yellow; legs brown; wings tinged with brown;  $Sc$  short; male hypopygium with a single bispinous dististyle, second spine shorter and placed on concave margin of style.

*Male*.—Length, about 2.5 millimeters; wing, 3.2.

Rostrum obscure orange; palpi dark brown. Antennæ (male) brownish black throughout, relatively elongate for a member of this subgenus; flagellar segments subcylindrical to fusiform, with a dense, erect, white pubescence but without elongate verticils, these being only about one-half length of segment. Head dark.

Anterior pretergites light yellow. Mesonotal præscutum and scutal lobes uniformly dark grayish brown, humeral region of præscutum restrictedly brightened; median region of scutum, posterior borders of scutal lobes, and broad apical margin of scutellum yellow; base of scutellum and adjoining portions of scutum darkened; mediotergite dark brown, sparsely pruinose. Pleura chiefly light yellow, including posterior sternopleurite, pteropleurite, meral region, and pleurotergite, ventral sternopleurite, and anepisternum somewhat darker. Halteres pale, knobs weakly darkened. Legs with fore coxæ darkened, re-

maining coxæ and all trochanters somewhat more testaceous; remainder of legs brown, femoral bases scarcely brightened. Wings (Plate 1, fig. 21) with a brownish tinge, prearcular region and cells C and Sc pale yellow; stigma diffuse, darker brown than ground; veins brown. Venation:  $R_{1+2}$  reaching costa but without trichia on extreme outer portion; Sc short.  $Sc_1$  ending shortly before origin of Rs, latter shorter than its anterior branch; cell  $R_5$  very strongly narrowed at outer end; m-cu at fork of M; cell 2d A wide.

Abdomen brown, sternites very little brighter; hypopygium obscure yellow. Male hypopygium (Plate 4, fig. 43) with dististyles, *d*, symmetrical. Outer lobe of basistyle, *b*, stout, extending about to opposite level of apex of dististyle. Dististyle, *d*, conspicuously bispinous, outer spine longer, slenderer, gently curved; second spine on concave margin at near midlength of style; surface of style with setigerous punctures, as figured. Phallosome, *p*, of the general type, of the *incompleta* group. terminal bilobed portion very narrow at base.

*Habitat*.—Philippines, Luzon.

Holotype, male, Batangas Province, Balayan, August 25, 1932 (*Rivera*).

*Gonomyia (Lipophleps) bimucronata* is most nearly allied to *G. (L.) incompleta* Brunetti (Japan to British India), differing markedly in the structure of the male hypopygium. The phallosome is much alike in all members of the group but the dististyles show unusually strong characters. In *incompleta* the dististyle is slender, prolonged into a slender apical spine, with a small tubercle or weak spine on the outer or convex face at base of spine. There is a slight difference in the dististyles of the two sides in *incompleta* but nothing to approach the asymmetry found in the allied *G. (L.) inaequistyla* Alexander (Mindanao to Celebes). In the other two Philippine members of the group, *G. (L.) maquilingia* Alexander and the present fly, the dististyles of the two sides are entirely alike.

GONOMYIA (GONOMYIA) HORRIBILIS sp. nov. Plate 1, fig. 22; Plate 4, fig. 44.

Belongs to the *noveboracensis* group; antennæ black throughout; thoracic pleura striped longitudinally with brown and yellow; wings brownish yellow, stigma vaguely darker but undelimited; Rs shorter than the long, nearly straight  $R_{2+3+4}$ ; male hypopygium with three dististyles; phallosome of unusual size and complexity, there being about six spinous points and branches on either side, some of these arms further complicated by delicate, pale setulæ.

*Male*.—Length, about 5 millimeters; wing, 5.5.

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

Rostrum obscure yellow or brownish yellow; palpi black. Antennæ black throughout; flagellar segments elongate, with long, conspicuous verticils, especially on intermediate segments. Head dark gray, occipital region obscure yellow medially.

Pronotum yellow above, more obscure on sides. Mesonotum almost uniform brownish gray, scutellum extensively obscure yellow. Pleura and pleurotergite obscure yellow, with a conspicuous, brown, longitudinal stripe extending from cervical region across dorsal pleurites, ending on pteropleurite; ventral sternopleurite somewhat less evidently darkened. Halteres pale. Legs with coxæ and trochanters yellow; remainder of legs brownish yellow, tarsal segments passing into black. Wings (Plate 1, fig. 22) with a brownish-yellow suffusion, prearcular and costal fields clearer yellow; stigmal region vaguely darker, undelimited; veins brown, prearcular veins, Sc and Cu<sub>2</sub>, clearer yellow. Venation: Sc<sub>1</sub> ending opposite origin of Rs, Sc<sub>2</sub> at its tip; Rs shorter than the long, nearly straight R<sub>2+3+4</sub>; m-cu about one-half its length beyond fork of M.

Abdominal tergites dark brown, pruinose, the narrow caudal borders of the segments and the pleural membrane yellow; sternites more uniformly yellow; genital segment obscure yellow. Male hypopygium (Plate 4, fig. 44) of unusual complexity, especially in the details of the phallosome, *p*. Basistyle, *b*, on mesal face before apex with a tubercle bearing three strong, powerful setæ. Three dististyles, the outer, *od*, longest, slender, distal portion a little expanded; intermediate style, *md*, shorter, very widely expanded at distal end, truncate or gently concave margin with about a dozen pale setæ in a linear row; inner style, *id*, shortest, appearing as a boomerang-shaped structure terminating in several long setæ, including usual fasciculate pair; outer margin of style at midlength expanded into a pale flange bearing two separated, pale, spinous setæ; at base of this flange a further triangular pale blade or lobe. Phallosome, *p*, of unusual complexity, as roughly shown by the figure, where only the structures of a single side are shown; there are no less than six such arms and branches, of which three bear delicate setæ; of the glabrous rods one is very small and inconspicuous; at the base of the phallosome are two short, blackened lobes that are densely set with short setulæ. Besides the parts shown, the phallosomic mass shows still further complexities of hair brushes that cannot be describe at this time.

*Habitat*.—Japan, Honshiu.

Holotype, male, Kamikochi, altitude 5,000 feet, June 13, 1939 (*Suenson*). Allotopotype, female, pinned with type. Paratopotypes, 3 females, June 13 to July 24, 1939.

The only described species of the *noveboracensis* group are the western Palæartic *Gonomyia* (*Gonomyia*) *edwardsi* Lackschewitz and *G. (G.) ithyphallus* Lackschewitz, the eastern Nearctic *G. (G.) noveboracensis* Alexander, and the western Nearctic *G. (G.) aciculifera* Alexander. The discovery of a species in the eastern Palæartic region is thus of very great interest. All five species have the dististyles of the male hypopygium of the approximate nature above described and all have the tremendously complicated phallosome, the species differing among themselves in various details of structure of both the styli and the phallosome.

**ORMOSIA (ORMOSIA) DEPRAVA** sp. nov. Plate 1, fig. 23.

Allied to *prava*; general coloration of body polished black; antennæ black; halteres pale yellow; femora yellow, tips broadly blackened; wings yellow, heavily washed and clouded with brown, especially along cord and veins Cu and 2d A; Sc<sub>2</sub> about opposite one-third length of Rs; cell 1st M<sub>2</sub> small, only about one-half as long as vein M<sub>4</sub> beyond it; caudal borders of abdominal tergites and sternites narrowly obscure yellow.

*Female*.—Length, about 8 millimeters; wing, 7.

Rostrum black; palpi dull black. Antennæ black throughout; flagellar segments oval, ends truncated; outer segments more elongate; longest verticils exceeding segments. Head black.

Thorax uniformly black, surface nitidous, especially præscutum. Halteres pale yellow, stem more whitened. Legs with coxæ black; trochanters brownish yellow; femora yellow, tips broadly blackened, unequally so on various legs, on fore pair involving about distal half, on middle and hind legs about distal third; tibiæ and basitarsi brownish black, tips narrowly blackened, posterior tibiæ paler than remaining tibiæ; remainder of tarsi black. Wings (Plate 1, fig. 23) with ground color yellow, conspicuously washed and clouded with brown; stigma long-oval, dark brown; broad washes the entire length of vein Cu in both cells M and Cu; a similar seam along vein 2d A involving cells on either side; a very extensive cloud along cord, slightly involving cells basad of cord but especially suffusing bases of outer radial and medial cells, appearing as seams to certain of the veins to the wing tip or nearly so:

prearcular and costal fields uniformly clear yellow; veins yellow in the flavous areas, brown in the infuscated portions. Macrotrichia of cells abundant, involving all cells of wing. Venation: Sc long, Sc<sub>1</sub> ending just before R<sub>2</sub>, Sc<sub>2</sub> far from its tip, about opposite one-third length of Rs; Rs long and straight; R<sub>2</sub> just beyond fork of R<sub>2+3+4</sub>; veins R<sub>3</sub> and R<sub>4</sub> turned slightly upward or cephalad; cell 1st M<sub>2</sub> small, rectangular, only about one-half length of vein M<sub>4</sub> beyond it; m-cu about one-fourth to one-fifth its length beyond fork of M; vein 2d A only gently sinuous, cell wide.

Abdomen polished black, caudal margins of both tergites and sternites narrowly obscure brownish yellow; genital segment black; valves of ovipositor yellow.

*Habitat*.—Japan, Honshiu.

Holotype, female, Kamikochi, altitude 5,000 feet, June 13, 1939 (*Suenson*).

Most closely allied to *Ormosia (Ormosia) prava* Alexander, of northern Korea. In the female sex the two species differ especially in the coloration of the wings and legs, and in the venation, as the more elongate R<sub>2+3+4</sub> of the present fly.

**ORMOSIA (ORMOSIA) NIPPOALPINA** sp. nov. Plate 1, fig. 24; Plate 4, fig. 45.

Belongs to the *nigripila* group; general coloration polished black; wings with a strong brown tinge; R<sub>2+3+4</sub> relatively short, about one and one-half as long as basal section of R<sub>5</sub>; cell 1st M<sub>2</sub> open by atrophy of m; petiole of cell M<sub>3</sub> short, subequal to or shorter than m-cu; anal veins divergent; male hypopygium with ædeagus subtended by broadly flattened and depressed pale phallosomic plates.

*Male*.—Length, about 4.5 millimeters; wing, 5.3.

*Female*.—Length, about 5 millimeters; wing, 5.7.

Rostrum and palpi black. Antennæ brownish black throughout, of moderate length, if bent backward extending nearly to wing root; flagellar segments oval to long-oval, longest verticils very conspicuous, nearly twice as long as segment; a dense white pubescence additional to verticils. Head black.

Thorax uniformly polished black, only pronotal scutellum and very restricted anterior lateral pretergites clear light yellow, the latter color even more obscured in the female. Halteres pale, knobs clear light yellow. Legs with coxæ black; trochanters brown; remainder of legs black, femoral bases restrictedly yellow, more conspicuous on forelegs. Wings (Plate 1, fig. 24)

with a strong brown tinge, prearcular portion clearer yellow: veins pale brown, more brightened in the flavous portions. Macrotrichia of cells relatively abundant, lacking in the cells at and near the region of arculus. Venation:  $R_{2+3+4}$  relatively short, about one and one-half as long as basal section of  $R_5$ ;  $R_2$  a little exceeding  $R_{2+3}$ ; cell  $M_2$  open by atrophy of  $m$ ; petiole of cell  $M_3$  short, subequal to or shorter than  $m-cu$ ; anal veins divergent.

Abdomen, including hypopygium, polished black. Ovipositor with cerci horn-yellow, blackened at bases. Male hypopygium (Plate 4, fig. 45) with structure of dististyles, *id*, *od*, much as in other members of *nigripila* group, apical point of outer style.

relatively short. Ædeagus subtended by broadly flattened and depressed pale phallosomic plates, *p*.

*Habitat*.—Japan, Honshiu.

Holotype, male, Kamikochi, altitude 5,000 feet, June 23, 1939 (Suenson). Allotopotype, female, with the type.

The present fly is entirely distinct from *Ormosia* (*Ormosia*) *diversipes* Alexander, the only other Japanese member of the group, in its open cell 1st  $M_2$ , polished-black coloration of the thorax, and in the structure of the male hypopygium. In the present fly the legs are similarly blackened in both sexes, not being differently colored in the males and females, as in *diversipes* and in *O. (O.) nigripennis* Alexander, of western China.

#### ERRATUM

Due to a regrettable oversight certain of the illustrations for Parts XLI [Phil. Jour. Sci. 71 (1940) 75] and XLII [Phil. Jour. Sci. 71 (1940) 203] of this series have been transposed. Plate 1 at the end of Part XLI belongs to Part XLII, and Plate 1 at the end of Part XLII belongs to Part XLI. The author has kindly corrected the error in all the reprints distributed by him.—EDITOR.

# ILLUSTRATIONS

[Legend: a, aedeagus; b, basistyle; g, gonapophysis; i, interbase; id, inner dististyle; od, outer dististyle; p, phallosome; s, sternite; t, tergite.]

## PLATE 1

- FIG. 1. *Tanyptera chrysophæa* sp. nov.; venation.  
2. *Ctenacroscelis persessilis* sp. nov.; venation.  
3. *Tipula* (*Yamatotipula*) *kamikochiensis* sp. nov.; venation.  
4. *Tipula* (*Acutipula*) *receptor* sp. nov.; venation.  
5. *Tipula* (*Schummelia*) *crastina* sp. nov.; venation.  
6. *Tipula* (*Oreomyza*) *lacunosa* sp. nov.; venation.  
7. *Tipula* (*Oreomyza*) *subdepressa* sp. nov.; venation.  
8. *Nephrotoma alticrista* sp. nov.; venation.  
9. *Nephrotoma circumcincta* sp. nov.; venation.  
10. *Cylindrotoma angustipennis* sp. nov.; venation.  
11. *Limonia* (*Dicranomyia*) *poli* sp. nov.; venation.  
12. *Limonia* (*Dicranomyia*) *retrograda* sp. nov.; venation.  
13. *Orimarga* (*Orimarga*) *fokiensis* sp. nov.; venation.  
14. *Dicranoptycha suenisoniana* sp. nov.; venation.  
15. *Dicranoptycha malabarica* sp. nov.; venation.  
16. *Dicranota* (*Eudicranota*) *radialis* sp. nov.; venation.  
17. *Limnophila* (*Elzophila*) *latinigra* sp. nov.; venation.  
18. *Limnophila transitoria* sp. nov.; venation.  
19. *Hexatoma* (*Eriocera*) *coomani* sp. nov.; venation.  
20. *Hexatoma* (*Eriocera*) *tonkinensis* sp. nov.; venation.  
21. *Gonomyia* (*Lipophleps*) *binucronata* sp. nov.; venation.  
22. *Gonomyia* (*Gonomyia*) *horribilis* sp. nov.; venation.  
23. *Ormosia* (*Ormosia*) *deprava* sp. nov.; venation.  
24. *Ormosia* (*Ormosia*) *nippoalpina* sp. nov.; venation.

## PLATE 2

- FIG. 25. *Tanyptera chrysophæa* sp. nov.; female antenna.  
26. *Tipula* (*Yamatotipula*) *kamikochiensis* sp. nov.; male hypopygium.  
FIGS. 27 and 28. *Tipula* (*Acutipula*) *receptor* sp. nov.; male hypopygium.  
FIG. 29. *Tipula* (*Schummelia*) *crastina* sp. nov.; male hypopygium.

## PLATE 3

- FIG. 30. *Tipula* (*Oreomyza*) *lacunosa* sp. nov.; male hypopygium.  
FIGS. 31 to 33. *Tipula* (*Oreomyza*) *subdepressa* sp. nov.; male hypopygium.  
FIG. 34. *Nephrotoma alticrista* sp. nov.; male hypopygium.  
35. *Limonia* (*Dicranomyia*) *poli* sp. nov.; male hypopygium.  
36. *Limonia* (*Dicranomyia*) *retrograda* sp. nov.; male hypopygium.



## PLATE 4

- FIG. *Orimarga (Orimarga) fokiensis* sp. nov.; male hypopygium.  
*Dicranoptycha suensoniana* sp. nov.; male hypopygium.  
*Dicranoptycha malabarica* sp. nov.; male hypopygium.
29. *Limnophila (Elæophila) latinigra* sp. nov.; male hypopygium.  
*Limnophila (Elæophila) similissima* sp. nov.; male hypopygium.  
*Limnophila transitoria* sp. nov.; male hypopygium.  
*Gonomyia (Lipophleps) bimucronata* sp. nov.; male hypopygium.  
*Gonomyia (Gonomyia) horribilis* sp. nov.; male hypopygium.  
*Ormosia (Ormosia) nipponalpina* sp. nov.; male hypopygium.

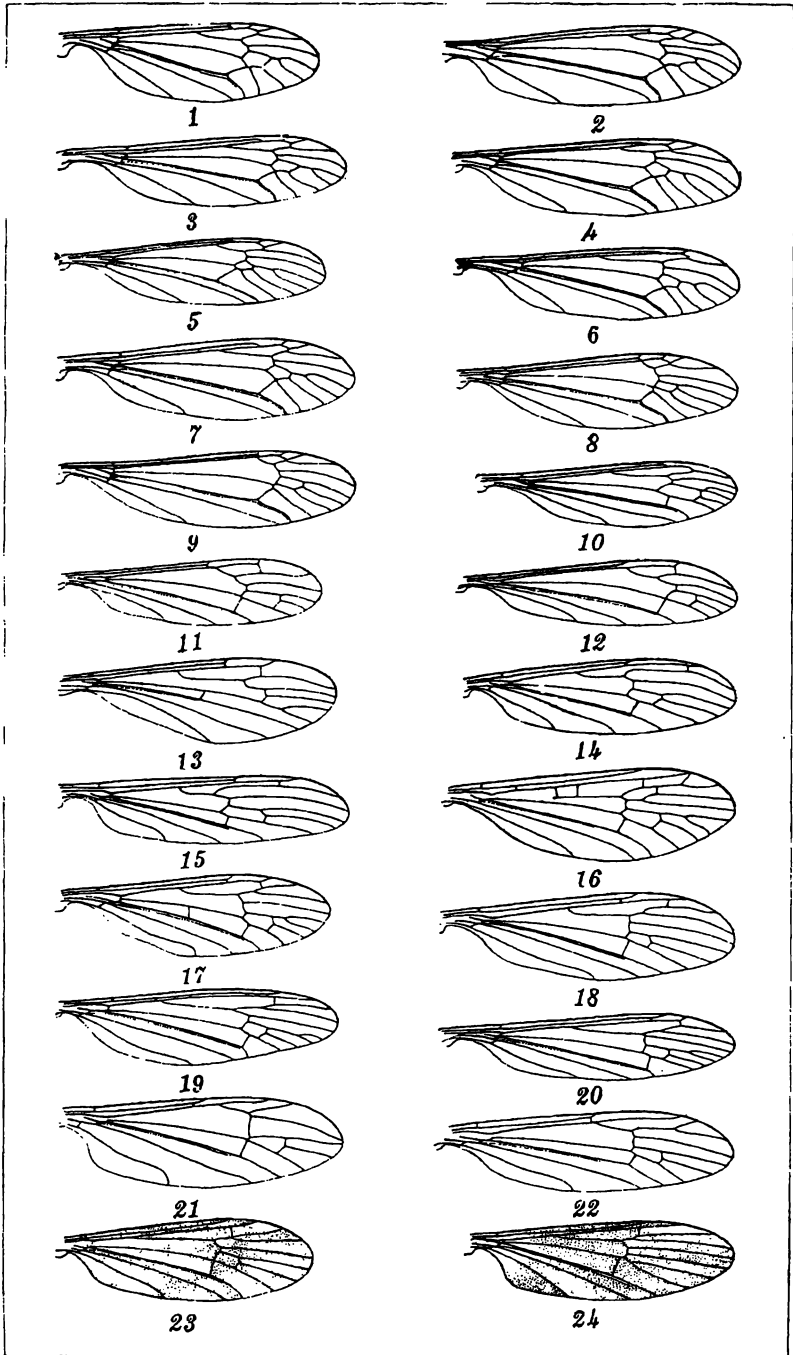
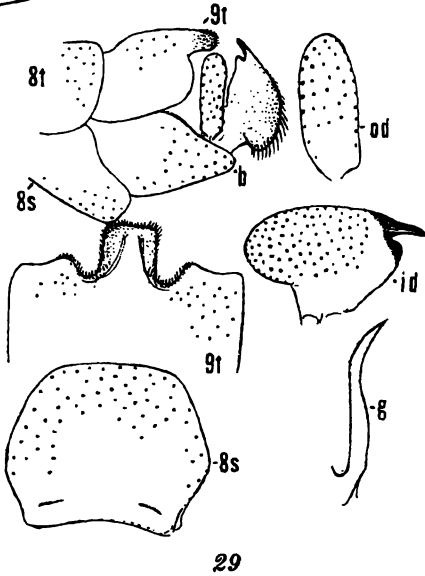
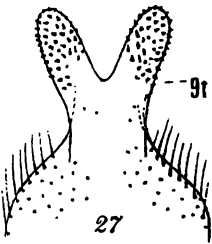
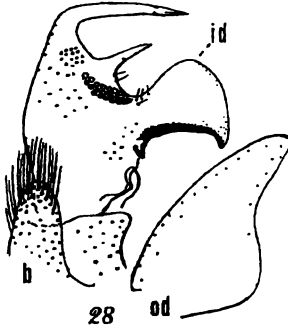
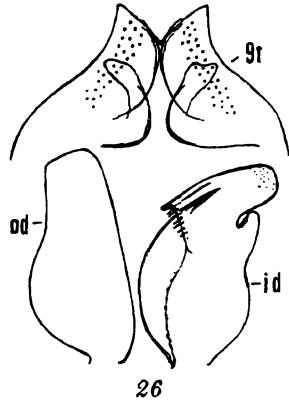


PLATE 1.



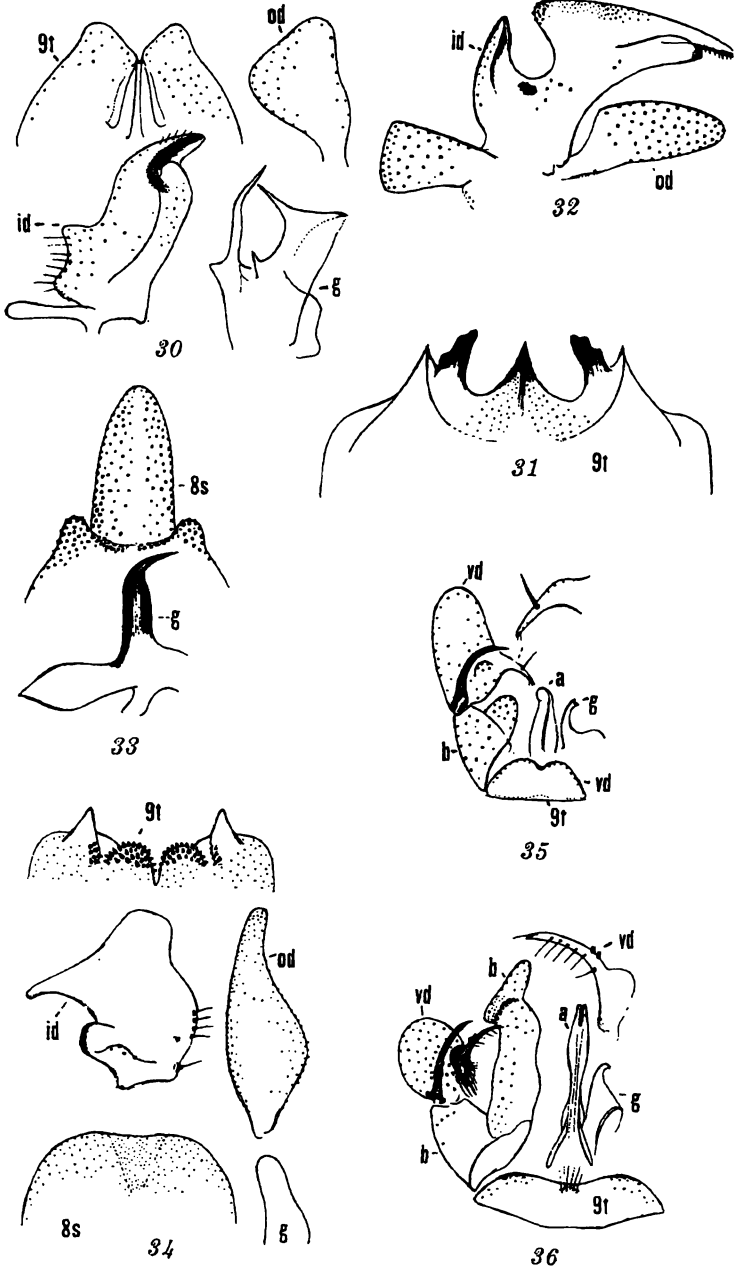


PLATE 3.

