

NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN  
ASIA (DIPTERA), XXIV<sup>1</sup>

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THREE PLATES

The crane flies considered in this report are chiefly from the mountains of Szechwan Province, western China, where they were collected by the Rev. Mr. David C. Graham. Smaller series discussed herewith are from Formosa, collected by Mr. J. Linsley Gressitt; from Japan, by Prof. Satoru Kuwayama; and from Kashmir, by Miss Vivien R. Hutchinson. The types of the species included in the Graham material are preserved in the United States National Museum, the remaining types in my own collection. My deepest thanks are extended to the above-mentioned collectors for this continued aid in making known the vast tipulid fauna of the area in question. Two species of the allied family Trichoceridæ are described in this paper.

TRICHO CERIDÆ

**TRICHO CERA RETICULATA** Alexander.

*Trichocera reticulata* ALEXANDER, Philip. Journ. Sci. 50 (1933) 129-130.

Known hitherto only from the unique type, taken on Mount Omei, Szechwan, July 18, 1931, by George M. Franck.

Two females, Wei Chow, Szechwan, 65 miles northwest of Chengtu, altitude 9,000 to 12,500 feet, August 15, 1933 (*Graham*).

**TRICHO CERA SAPPORENSIS** sp. nov. Plate 1, fig. 1; Plate 2, fig. 25.

Belongs to the *maculipennis* group; general coloration of mesonotum dark brownish gray, the præscutum with four darker brown stripes; knobs of halteres dark brown; legs with femora brown, the outer ends passing into dark brown; wings yellowish subhyaline, with a heavy brown pattern, including a broken brown crossband at near midlength of the outer radial field;

<sup>1</sup> Contribution from the entomological laboratory, Massachusetts State College.

abdomen, including the hypopygium, dark brown; male hypopygium with the dististyle cylindrical, without basal armature.

*Male*.—Length, about 6.5 millimeters; wing, 7.

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

Mesonotal præscutum dark brownish gray, with four darker brown stripes, the intermediate pair clearly defined, separated from one another by a clear ground vitta that is more than one-half as wide as either stripe; lateral stripes broader but less clearly defined; posterior sclerites of mesonotum dark brown, pruinose. Pleura dark brown, pruinose. Halteres elongate, the stem yellow, the knob dark brown. Legs with the coxæ brown; trochanters brownish yellow; femora brown, the outer ends passing into dark brown; tibiæ and tarsi brownish black to black. Wings (Plate 1, fig. 1) with the ground color yellowish subhyaline, the costal margin more saturated; a relatively heavy brown pattern, including spots at origin of Rs, Sc<sub>2</sub>, a stigmal area at R<sub>2</sub>, along cord and outer end of cell 1st M<sub>2</sub>; a spot at tip of vein 2d A in cell 1st A; an outer, more or less broken, brown band crossing the outer medial field at near midlength of the cells; veins brown. Venation: Sc<sub>1</sub> ending just beyond R<sub>2</sub>; cell R<sub>3</sub> a little constricted just before outer end; m-cu about one-half its length before fork of M<sub>3+4</sub>.

Abdomen, including hypopygium, dark brown. Male hypopygium (Plate 2, fig. 25) with the mesal lobes of basistyle, *b*, contiguous on midline. Dististyle, *d*, rather short-cylindrical, without basal tubercle; mesal face with abundant delicate setulæ, distributed throughout the length.

*Habitat*.—Japan (Hokkaido).

Holotype, male, Sapporo, Ishikari, September, 1922 (*Kuwayama*).

The relationship of this fly to other members of the *maculipennis* group in eastern Asia is shown by the accompanying key.

*Key to the species of the maculipennis group (genus Trichocera) in eastern Asia.*

1. Femora brown or brownish yellow, with a subterminal brown or brownish black ring, the extreme tip pale yellow to whitish; in cases, only the posterior femora are evidently so patterned..... 2.
- Femora without a dark ring near apex, the actual tip dark..... 5.
2. Wing pattern abundantly reticulated, including a series of dots and transverse dashes in cells C, Sc<sub>1</sub>, all outer cells, and in cells Cu and 1st A. (Western China.)..... *reticulata* Alexander.
- Wing pattern not reticulated..... 3.

3. Wing pattern light, usually without markings across outer radial field or spots in cell 2d A; dark areas not involving outer medial field; at most, a single dark spot in cell 1st A. (Western Palæarctic Region.)  
*maculipennis* Meigen.  
Wing pattern heavy, including a broken outer band that crosses the radial and medial fields; two dark spots in cell 1st A..... 4.
4. Wings with the ground color nearly hyaline; second dark spot in cell 1st A not touching vein 2d A; male hypopygium without basal tubercle on dististyle. (Himalayan Region.)..... *punctipennis* Brunetti.  
Wings strongly tinged with yellow, especially along costal border; second dark spot in cell 1st A touching vein 2d A; male hypopygium with a basal tubercle on dististyle. (Western China.)  
*szechwanensis* sp. nov.
5. General coloration of mesonotum brown; abdominal segments brown, ringed with yellow. (Formosa.)..... *arisanensis* Alexander.  
General coloration of mesonotum dark gray or brownish gray; abdomen uniformly darkened or with the segments merely pruinose at outer end ..... 6.
6. Male hypopygium without basal tubercle on dististyle; wing pattern heavy, in male including a band across outer radial field. (Northern Japan.) ..... *sapporensis* sp. nov.  
Male hypopygium with a small basal tubercle on dististyle; wing pattern light, in male without a band across outer radial field. (Japan.)  
*pictipennis* Alexander.

I have omitted *Trichocera ocellata* Walker from the above key because of lack of data on certain of the points used in the key structure. The species should be readily distinguished from all species keyed above by the partly ocelliform nature of the wing pattern.

**TRICHOCERA SZECHWANENSIS** sp. nov. Plate 1, fig. 2; Plate 2, fig. 26.

Belongs to the *maculipennis* group; general coloration gray, the præscutum with four, narrow, dark brown stripes; femora brownish yellow, the tips of fore and middle femora darkened, the posterior femora with a subterminal dark ring; wings strongly suffused with yellow, heavily patterned with brown; male hypopygium with a small basal tubercle on mesal face of dististyle.

*Male*.—Length, about 6.5 to 7.5 millimeters; wing, 7.5 to 9.

*Female*.—Length, 7 to 8.5 millimeters; wing, 7.5 to 10.

Rostrum and palpi black. Antennæ with scape brownish black; pedicel more reddish brown; flagellum black. Head gray.

Mesonotal præscutum gray with four narrow and distinct dark brown stripes, the intermediate pair separated by a ground line that is nearly as wide as the stripe itself; posterior sclerites of notum gray. Pleura gray. Halteres yellow, the knobs dark

brown. Legs with the coxæ brownish gray; trochanters obscure yellow; femora brownish yellow, the tips dark brown; on posterior femora the dark rings distinctly subterminal, with narrow but conspicuous yellow tips; on fore and middle femora the dark rings are apical or virtually so; tibiæ and basitarsi light yellowish brown; outer tarsal segments passing into brownish black. Wings (Plate 1, fig. 2) with the ground color strongly suffused with yellow, more saturated in the costal portion; an unusually heavy brown pattern, including areas at origin of  $R_s$ ,  $Sc_2$ , along cord and outer end of cell 1st  $M_2$ , and a broad, nearly unbroken, oblique band across the outer radial and medial fields; in cases, the latter band appears double, with pale centers; in addition to the above, a series of dark marginal spots at ends of all longitudinal veins, the largest at 2d A, contiguous with the tip of the vein; in the more heavily patterned specimens, especially females, the entire caudal border of cell 1st A is uninterruptedly darkened; in still other cases with transverse dashes in basal portions of cells  $R_4$  and  $R_5$ , extending from near the fork of vein  $R_{2+3+4}$  to  $m$ ; veins pale, darker in the clouded areas. A series of trichia at near midlength of vein 2d A, lacking at both ends. Venation:  $m-cu$  close to fork of  $M_{3+4}$ .

Abdomen dark brown, the caudal borders of segments in female narrowly paler; hypopygium dark. Male hypopygium (Plate 2, fig. 26) with the dististyle,  $d$ , cylindrical, on mesal face at base with a small tubercle.

*Habitat.*—China (Szechwan).

Holotype, male, Chengtu, altitude 1,800 feet, February 20, 1933 (*Graham*). Allotopotype, female, February 28, 1933. Paratopotypes, several males and females, February 20 to March 13, 1933; paratype, 1 male, Kwanhsien, altitude 2,000 to 4,000 feet, May 15 to 31, 1933 (*Graham*).

The nearest allies of the present fly are *Trichocera pictipennis* Alexander and *T. punctipennis* Brunetti. The characters separating these species and other regional members of the group are shown by the key given in connection with the preceding species. Several of the specimens in the type series are much smaller than the holotype and allotype chosen as being representative of the species, but the entire series appears to present a single form.

## TIPULIDÆ

## TIPULINÆ

TIPULA (VESTIPLEX) OPTANDA sp. nov. Plate 1, fig. 3; Plate 2, figs. 27 and 28.

General coloration of mesonotum yellow, with four grayish brown stripes that are narrowly bordered by dark brown, the intermediate pair confluent at anterior ends; capillary median lines on head and on mesonotum from suture caudad to base of abdomen; knobs of halteres dark brown; femora brownish yellow, the tips blackened, preceded by a vague, more yellowish ring; wings relatively narrow, marmorate with cream-colored and darker areas; basal abdominal tergites yellow, trivittate with brown; fifth and succeeding abdominal segments black; male hypopygium with a small apical spine on basistyle; mesal appendage of basistyle black, forked at tip.

*Male*.—Length, about 17 millimeters; wing, 20.

Frontal prolongation of head yellow, darker laterally; nasus long and slender; palpi dark. Antennæ (male) relatively long, if bent backward extending approximately to base of abdomen; scape and pedicel yellow; first flagellar segment light brown; remaining flagellar segments black, the extreme apex of the more proximal segments a trifle paler; longest verticils very nearly equal in length to the segments. Head chiefly covered with a golden yellow pollen; central portion of posterior vertex with a conspicuous brown streak.

Mesonotal præscutum yellow with four grayish brown stripes that are narrowly bordered by dark brown, the intermediate pair confluent at anterior ends; scutal lobes with two confluent dark brown areas on outer portion; scutellum and mediotergite golden yellow; a capillary, dark brown, median vitta extends from the suture to the base of abdomen, slightly interrupted at the sutures. Pleura yellow, variegated with darker on the anepisternum. Halteres brownish yellow, the knobs dark brown. Legs long and slender; coxæ and trochanters yellow; femora brownish yellow basally, passing into black on outer two-thirds, the tips broadly black, preceded by a vague, more yellowish ring; tibiæ and tarsi black. Wings (Plate 1, fig. 3) relatively narrow; ground color brown, variegated by cream-colored and darker areas; cell Sc more darkened, pale beyond origin of Rs;

a dark mark in bases of cells R and M; a small inclosed white spot at proximal end of stigma; apical cells of wing uniformly darkened; cell 2d A variegated by pale at base and at outer end; veins dark brown. Venation:  $R_{1+2}$  entire but pale, with trichia only at extreme proximal end; cell 1st  $M_2$  relatively long, its outer end somewhat pointed by the obliquity of m.

Abdominal tergites yellow, with a broad median stripe and much narrower, sublateral, brown stripes; fifth and succeeding segments uniformly black; basal sternites yellow. Male hypopygium (Plate 2, fig. 27) with the tergite, 9t, fused with sternite, 9s, on its cephalic portion. Tergite (Plate 2, fig. 28, 9t) with the outer lobes relatively long and slender, fleshy and conspicuously setiferous, divergent; caudal margin of tergite with a broad U-shaped notch; on ventral surface of tergite, on either side, with a compressed black plate, the apex of which is microscopically serrulate. Basistyle at apex (Plate 2, fig. 28, b) produced into a small, slender, straight or gently curved spine, much more reduced and delicate than in most species of the subgenus; on mesal-posterior portion of basistyle a larger curved black hook; immediately above this point and apparently arising from the ninth sternite, a long, slender, curved, black rod (Plate 2, fig. 28, m), decussate with its mate across the median line, at apex split into two branches; outer branch a little longer than the lower one; outer margin and surface of this rod with long, delicate, pale setæ. Dististyles as shown (Plate 2, fig. 27, id, od). Eighth sternite unarmed with setæ.

*Habitat*.—China (Szechwan).

Holotype, male, Kwanhsien, altitude 2,000 to 4,000 feet, May 15 to 31, 1933 (*Graham*).

The nearest ally of this fly is undoubtedly *Tipula (Vestiplex) parvopiculata* Alexander, of northern Formosa, which has the same reduced spine on the basistyle of the male hypopygium and with the mesal appendage of the ninth sternite of somewhat similar form though pale yellow in color. The Formosan species is separated by the much shorter antennæ, details of wing pattern, and the structure of the male hypopygium.

**TIPULA (VESTIPLEX) IMMOTA** sp. nov. Plate 1, fig. 4; Plate 2, fig. 29.

General coloration of mesonotum brownish yellow, the præscutum with four conspicuous brown stripes, the intermediate pair narrowly confluent in front; antennæ (male) elongate; head and posterior sclerites of mesonotum with a narrow brown

capillary vitta; wings whitish subhyaline, marmorate with pale and darker brown areas; basal abdominal segments yellow, the outer segments black; male hypopygium with the basistyle produced into a curved black spine; inner dististyle narrow, the tip obtusely rounded.

*Male*.—Length, 12 to 13 millimeters; wing, 13 to 15; antenna, 5 to 6.

Frontal prolongation of head yellow; nasus elongate; a narrow dark line on side of prolongation; palpi brownish black. Antennæ (male) elongate; basal three segments light yellow; flagellar segments bicolorous, the basal enlargement and adjoining portions of the individual segments dark, the remainder brownish yellow; in the paratype male the segments are more uniformly darkened, with only the outer ends of the segments restrictedly yellow. Head yellow, with a narrow, capillary, brown median vitta.

Mesonotal præscutum brownish yellow, with four conspicuous brown stripes that are not bordered by darker but are narrowly margined with clearer yellow outside the limits of the stripes; intermediate pair very narrowly confluent at anterior margin; scutal lobes brownish yellow, each with two conspicuous brown areas; scutellum and mediotergite brownish yellow, with a narrow brown median line that is narrowly interrupted on posterior portion of the scutellum. Pleura yellow, more grayish on the ventral anepisternum and sternopleurite. Halteres yellow, the knobs dark brown, their tips paler. Legs with the coxæ and trochanters yellow; femora brownish yellow, the tips conspicuously blackened, preceded by a vaguely brighter, clearer yellow annulus; tibiæ dark brown, passing into black; tarsi black. Wings (Plate 1, fig. 4) whitish subhyaline, variegated by pale brown and darker brown areas; the darker markings include major areas in bases of cells R and M, together with the stigma and a confluent cloud on anterior cord; paler brown areas cloud most of the wing disk, including the entire wing tip except a vague brightening in outer end of cell R<sub>5</sub>; veins brown. Venation: R<sub>3</sub> rather strongly upcurved, a little less so in the type than in the paratype (which is figured).

Basal abdominal segments yellow, the first segment and basal ring of second tergite darkened medially; sixth and succeeding segments black. Male hypopygium (Plate 2, fig. 29) with the basistyle, *b*, entirely cut off from sternite, 9s, by a suture; poste-

rior end of basistyle produced into an acute blackened spine that is directed caudad, dorsad, and slightly mesad. Ninth tergite, *9t*, transverse, the caudal margin with a broad U-shaped emargination, the border of this notch heavily blackened, especially the nearly acute sublateral lobes; sublateral lobes separated from paler outer lobes by small V-shaped notches; tergite not divided medially by membrane, but restrictedly paler in color at midline, and the midregion of the blackened margin with a microscopic split; caudal border of tergite with conspicuous setæ. Outer dististyle, *od*, a narrow dusky lobe with abundant coarse setæ. Inner dististyle, *id*, unusually narrow, the tip obtuse, the face with two low blackened lobes; outer margin of style with abundant erect yellow setæ.

*Habitat.*—China (Szechwan).

Holotype, male, Kwanhsien, altitude 2,000 to 4,000 feet, May 15 to 31, 1933 (*Graham*). Paratopotype, male.

The present fly is readily told from other small species of the subgenus having the basistyle produced into a simple acute spine and with the wings darkened in the proximal ends of cells R and M, by the elongate antennæ of the male and the structure of the male hypopygium, notably the undivided tergite and the narrow, obtusely pointed, inner dististyle.

TIPULA (OREOMYZA) COXITALIS sp. nov. Plate 1, fig. 5; Plate 2, figs. 30 and 31.

General coloration yellow, the præscutum with four narrow brownish stripes, the intermediate pair narrowly divided by a pale line; antennal flagellum bicolorous; tips of femora darkened; wings yellow, the prearcular and subcostal regions brighter yellow; disk of wing variegated by dark and pale brown clouds; outer end of cell 1st  $M_2$  pointed; male hypopygium with the basistyle entire, produced caudad into a long powerful arm; a pencil of reddish setæ on either side of median line of ninth sternite.

*Male.*—Length, about 15 to 18 millimeters; wing, 16 to 19.

*Female.*—Length, 18 to 20 millimeters; wing, 16 to 18.5.

Frontal prolongation of head brownish yellow; nasus long and conspicuous; palpi dark brown, the incisures paler. Antennæ (male) of moderate length, if bent backward extending nearly to root of halteres; scape, pedicel, and first flagellar segment yellow; succeeding flagellar segments bicolorous, yellow, with the basal enlargements of the individual segments black; outer segments more obscured, but retaining the bicolorous nature to the end; longest verticils subequal in length to the segments.



Head buffy, with a very faint brown median line; posterior orbits very narrowly pale.

Mesonotal præscutum yellow, with four narrow brownish stripes, the intermediate pair narrowly separated except at extreme posterior end by a capillary pale vitta; mesal edges of anterior third of intermediate stripes a little darker than the corresponding outer edges; small brown spots in humeral area; scutum yellow, each lobe variegated by darker yellow; scutellum and mediotergite yellow with a continuous dark median vitta. Pleura yellow. Halteres yellow, the bases of knobs black. Legs with the coxæ and trochanters yellow; femora brownish yellow, the tips narrowly blackened; tibiæ slightly darker than the femora, the tips very narrowly darkened; tarsi black. Wings (Plate 1, fig. 5) yellow, the prearcular and subcostal regions clear bright yellow; cell C more infumed; stigma dark brown; extreme apical margin darkened; remainder of disk variegated by pale brown clouds, including the wing tip; small darker brown areas in bases of cells R and M, at origin of Rs, and on anterior cord, the last extending across cell R<sub>1</sub> to isolate a small white spot before the stigma; veins brown, yellow in the flavous areas. Macrotrichia of veins relatively numerous; squama naked. Venation: Outer end of cell 1st M<sub>2</sub> strongly pointed by the obliquity of vein m; petiole of cell M<sub>1</sub> shorter than m.

Abdomen with basal tergites yellow, narrowly trilineate with dark brown, the lateral borders paler; sternites more uniformly pale; outer segments and hypopygium more uniformly blackened. Male hypopygium (Plate 2, fig. 30) with the tergite, 9t, fused on cephalic third with the sternite, 9s; basistyle (coxite), b, very large and powerful, entirely cut off from the sternite, produced caudad into a long arm that is a little expanded at distal end. Ninth tergite (Plate 2, fig. 31, 9t) completely divided along midline by pale membrane, the lateral lobes produced into short blackened horns, ventrad of each of which lies a slightly more extensive, darkened lobe. Dististyles as figured; beak of inner dististyle (Plate 2, fig. 31, id) heavily blackened, the outer posterior angle produced into a gently curved lobe; on face of style near base with a much longer rod. Ninth sternite, 9s, near caudal end on either side of midline with a conspicuous hair pencil of reddish bristles, these pencils not arising from basal tubercles. Ovipositor with the basal shield exceeding the cerci in length.

*Habitat.*—Formosa.

Holotype, male, Hassensan, altitude 6,532 feet, June 26, 1934 (*Gressitt*). Allotopotype, female, altitude 4,875 feet, June 22, 1934. Paratopotype, male, altitude 6,700 feet, June 26, 1934; paratype, female, Bukai, altitude 2,775 feet, June 14, 1934 (*Gressitt*).

Among the hitherto defined regional species, I regard the present fly as being most nearly allied to *Tipula terebrata* Edwards (Formosa), which differs in the black flagellum, distinct thoracic pattern, notably the blackened confluent inner margins of the intermediate præscutal stripes, and the truncated outer end of cell 1st  $M_2$ . Both of the above are allied to the species next described, *Tipula (Oreomyza) sternotuberculata* sp. nov. I would place all of these species in the subgenus *Oreomyza* Pokorny.

**TIPULA (OREOMYZA) STERNOTUBERCULATA** sp. nov. Plate 1, fig. 6; Plate 2, figs. 32 and 33.

Allied to *coxitalis*; antennæ of moderate length, bicolorous; præscutum olive-yellow, with four more olive-brown stripes; tips of femora broadly black; wings brown, variegated by darker brown and cream-colored areas; outer abdominal segments black; male hypopygium with the ninth sternite on either side of median line produced into long black tubercles that are tufted with relatively short golden yellow setæ; basistyle long-produced.

*Male.*—Length, 13 to 15 millimeters; wing, 15 to 18.

Frontal prolongation of head obscure yellow, a little darker above; nasus distinct; palpi brown. Antennæ (male) of moderate length, if bent backward extending about to root of halteres; scape, pedicel, and first flagellar segment yellow; succeeding flagellar segments bicolorous, the basal enlargements dark brown, the outer portions obscure yellow, on outer segments passing into brown; verticils shorter than the segments. Head olive-green, more yellowish in front; no distinct dark marking on vertex.

Pronotal scutellum pale with a conspicuous, dark brown, median spot. Mesonotal præscutum olive-yellow with four more olive-brown stripes, the intermediate pair separated by a pale line throughout the entire length; scutum pale olive-yellow, variegated by slightly darker olive-yellow; scutellum and mediotergite olive-green, with a capillary brown vitta that is scarcely evident. Pleura buffy, variegated by more olive-green on ane-

pisternum and sternopleurite. Halteres infumed, the base of stem and apex of knob yellow. Legs with the coxæ buffy; trochanters yellow; femora brownish yellow, the tips broadly black, with a more or less distinct, clearer yellow, subterminal ring; tibiæ dark brown; tarsi black. Wings (Plate 1, fig. 6) with the ground color brown, sparsely variegated by darker brown and with more abundant cream-colored areas; the darker spots include the stigma, together with an adjoining area on anterior cord and a mark at origin of Rs; bases of cells R and M not or scarcely darkened; veins brown. Venation: Rs long, just exceeding  $R_3$ ; cell 1st  $M_2$  small; petiole of cell  $M_1$  a little longer than m.

Basal abdominal tergites yellow, indistinctly trivittate with brown, the lateral margins narrowly pale; at near midlength of the organ, the stripes become heavier; outer abdominal segments, including hypopygium, black; basal sternites more uniformly yellow. Male hypopygium (Plate 2, fig. 32) with the tergite, 9t, separated from the sternite, 9s, by membrane, united on cephalic portion. Basistyle, b, long-produced, as in *coxitalis*, but of different conformation. Ninth tergite (Plate 2, fig. 33, 9t) entirely divided medially; caudal lobes adjoining the mesal membrane clothed with long yellow setæ; ventrad of these lobes, a more-depressed blackened plate. Dististyles as figured; inner style (Plate 2, fig. 33, id). Ninth sternite, 9s, on either side of median line produced into long basal tubercles that are tufted with relatively short golden-yellow setæ.

*Habitat.*—Formosa.

Holotype, male, Arisan, altitude 7,640 feet, May 24, 1934 (*Gressitt*). Paratopotype, male, altitude 6,200 feet, May 26, 1934 (*Gressitt*).

The nearest ally of the present fly is undoubtedly *Tipula* (*Oreomyza*) *coxitalis* sp. nov., which differs most evidently in the hypopygial characters, notably the nontuberculate ninth sternite. Both species seem to be nearly allied to *T. (O.) terebrata* Edwards, the male of which is unknown.

TIPULA (OREOMYZA) RESUPINA sp. nov. Plate 1, fig. 7; Plate 2, fig. 34.

General coloration light gray, the præscutum with four dark grayish brown stripes, the intermediate pair darker in front and clearly divided by a capillary line of the ground color, becoming confluent behind; knobs of halteres infuscated; fore and middle femora black, the bases restrictedly yellow; posterior

femora yellow, the distal fourth black; tibiæ yellowish brown, the tips narrowly blackened; wings whitish subhyaline, the prearcular region and cell Sc light yellow; a sparse darker pattern on disk;  $R_{1+2}$  preserved on basal half; abdominal tergites narrowly lined medially with dark brown, the sternites more broadly so; male hypopygium with the tergite entirely pale; eighth sternite tufted with yellow setæ.

*Male*.—Length, about 11 millimeters; wing, 12.5.

Frontal prolongation of head brownish gray above, more sparsely pruinose on sides; nasus long and slender. Antennæ (male) of moderate length, if bent backward extending approximately to root of halteres; basal three segments clear light yellow; fourth segment yellow, with the base weakly darkened; succeeding segments bicolorous, dark basally, the remainder yellow, only the outer three or four segments more uniformly darkened; longest verticils a little shorter than the segments. Head clear ashy gray.

Mesonotal præscutum gray, with four dark grayish brown stripes, the intermediate pair darker in front and here clearly separated by a line of the ground color, converging behind and becoming confluent on posterior half; lateral stripes narrow and paling to the ground color behind; setigerous punctures of the interspaces relatively conspicuous; scutal lobes light gray, variegated by dark brownish gray areas; posterior sclerites of mesonotum light gray, the mediotergite with a linear median mark on cephalic half. Pleura light ashy gray; dorsopleural membrane pale yellow. Halteres pale yellow, the knobs infuscated. Legs with the coxæ light gray; trochanters brownish yellow; fore and middle femora black, only the bases restrictedly yellow; posterior femora obscure brownish yellow, with about the distal fourth black; tibiæ yellowish brown, the tips narrowly blackened; tarsi passing into black. Wings (Plate 1, fig. 7) with the ground color whitish subhyaline, sparsely variegated by pale brown; prearcular region and cell Sc light yellow; cell C slightly darker; stigma dark brown, confluent with a paler brown cloud on anterior cord; dark spot at origin of Rs small; outer ends of radial field darkened; longitudinal veins beyond cord, together with  $Cu_1$  and 2d A, narrowly seamed with brown; veins brown, brighter in the flavous areas. Venation:  $R_{1+2}$  preserved on more than basal half, bent strongly backward or basad, widening the cell at margin; no macrotrichia on  $R_{1+2}$ ; cell 1st  $M_2$  relatively long and narrow.

Abdominal tergites obscure yellow, with a conspicuous dark brown median stripe that is narrowly interrupted at the posterior border of the segments; sternites chiefly dark brown, the lateral portions narrowly brightened. Male hypopygium (Plate 2, fig. 34) with the tergite, 9*t*, entirely separated from the sternite; basistyle entire. Ninth tergite (Plate 2, fig. 34, 9*t*) along the sides about as long as wide, narrower in the central portion, entirely pale in color; outer third narrowed, the caudal margin with a U-shaped notch; a tiny median incision, with short ridges on dorsal surface of tergite back from this point. Styli as shown, the outer dilated at outer end. Eighth sternite with an abundant brush of yellow setæ on caudal margin, those on the lateral portions longer and more conspicuous than those on median area.

*Habitat*.—China (Szechwan).

Holotype, male, Kwanhsien, altitude 2,000 to 4,000 feet, May 15 to 31, 1933 (*Graham*).

The wings of the present fly are most like those of *Tipula* (*Oreomyza*) *percara* Alexander (southwestern China, in September), the latter differing in the yellow halteres, barely indicated præscutal stripes, and median dark line on head. Other generally similar regional species, including *jedoensis* Alexander, *legalis* Alexander, *mutiloides* Alexander, *pedicellaris* Alexander, and *submutila* Alexander, differ in the blackened antennal flagellum and all details of venation and of body and wing coloration.

TIPULA (OREOMYZA) EXCETRA sp. nov. Plate 1, fig. 8.

*Female*.—Length, 15 to 16 millimeters; wing, 15 to 15.5.

Most nearly allied to *Tipula* (*Oreomyza*) *striatipennis* Brunetti (eastern Himalayas) and *T. (O.) quadrifasciata* Matsuura (Japan), differing in colorational details, as follows:

Compared with *striatipennis*: Antennæ with basal four segments yellow, the succeeding segments brownish black; in *striatipennis* the scape and pedicel are yellow, the basal flagellar segments bright reddish brown, only the outer segments becoming darker brown. Median præscutal stripe divided on posterior half by a dusky line, the anterior ends of the intermediate stripes darkened; setigerous punctures on interspaces conspicuous; in *striatipennis*, small and inconspicuous.

Compared with *quadrifasciata*: Frontal prolongation of head, including nasus, gray; in *quadrifasciata* the nasus is abruptly

light yellow. Antennæ with basal four segments yellow; in *quadrifasciata* the basal three, with the remaining segments are dark brown. In *quadrifasciata* the median præscutal stripe behind not divided by a dusky line; scutellum with a median brown vitta that is obsolete in *quadrifasciata*.

All three species agree in having a more or less distinct median line on the gray vertex; setigerous punctures on the præscutal interspaces; legs with all femora, excepting their very narrow bases, uniformly black; wings whitish, quadrifasciate with pale brown; cell C uniformly dark brown; vein  $R_{1+2}$  with all but a basal spur atrophied.

*Habitat*.—China (Szechwan).

Holotype, female, Kwanhsien, altitude 2,000 to 4,000 feet, May 15 to 31, 1933 (*Graham*). Paratopotype, female.

TIPULA (OREOMYZA) IGNOSCENS sp. nov.

Allied to *striatipennis*; mesonotal præscutum gray, with four brownish gray stripes, the intermediate pair confluent on posterior half; fore femora chiefly black, the middle and hind femora obscure yellow, with about the distal sixth blackened; wings cream-colored with four diffuse brown crossbands; prearcular region strongly suffused with yellow; cell C black; wing apex broadly darkened; vein  $R_{1+2}$  preserved as a basal spur.

*Female*.—Length, about 16 millimeters; wing, 15.5.

Frontal prolongation of head dark gray dorsally, the nasus concolorous; sides of prolongation brown; palpi black. Antennæ (female) relatively long, exceeding the palpi in length; flagellar segments much longer than in *excetra*; basal four segments yellow, the succeeding segments bicolorous, dark basally, the outer portion yellow; outer two or three segments more uniformly darkened; segments about as long as the longest verticils. Head gray, with a very delicate, barely indicated, capillary, dark line extending from the summit of the vertical tubercle to the occiput.

Mesonotum gray, the præscutum with four brownish gray stripes that are best indicated on their anterior ends, the intermediate pair confluent on posterior half, on anterior portion separated by a narrow gray line; setigerous punctures small; posterior sclerites of notum dark gray, the mediotergite with a central dark vitta. Pleura gray, the dorsopleural region more yellow. Halteres yellow, the knobs dark brown. Legs with the coxæ light gray; trochanters yellow; fore femora chiefly black,

the bases narrowly yellow; middle and hind femora obscure yellow, passing into brownish yellow, the tips narrowly blackened, involving only the distal sixth or approximately so; tibiæ and tarsi black. Wings much as in *excetra* but the ground color more creamy than white; posterior prearcular region strongly suffused with yellow; cell C uniformly black, much wider than in *excetra*, cell Sc correspondingly narrow; dark crossbands more extensive, encroaching on the ground color; second dark band widely expanded behind, in cell 1st A including the entire posterior border excepting a narrow space adjoining vein 1st A; wing tip more extensively darkened, restricting the post-stigmal ground area, which here embraces only about one-third the length of cell  $R_3$ , in *excetra* and allies, nearly if not quite one-half the cell; veins yellow, brown in the clouded areas. Venation:  $R_{1+2}$  preserved as a basal spur that is nearly as long as  $R_2$  alone; m-cu at the fork of  $M_{3+4}$ .

Abdominal tergites obscure yellow, with a broad, conspicuous, black, median stripe, most evident on the basal segments, becoming narrower and the surface more pruinose on the outer segments; sternites dark, the surface pruinose. Shield of ovipositor polished chestnut; cerci long and slender, straight.

*Habitat.*—China (Szechwan).

Holotype, female, Kwanhsien, altitude 2,000 to 4,000 feet, May 15 to 31, 1933 (*Graham*).

*Tipula* (*Oreomyza*) *ignoscens* is most closely allied to *T. (O.) striatipennis* Brunetti and allies, including the regional *excetra* sp. nov. and *latiflava* Alexander, differing especially in the pattern of the legs and wings.

**TIPULA (LUNATIPULA) MULTISETOSA** sp. nov. Plate 1, fig. 9; Plate 3, figs. 35 and 36.

Belongs to the *marmoratipennis* group; allied to *multibarbata*; antennal flagellum black; mesonotal præscutum light gray, with four brownish gray stripes that are narrowly bordered by dark brown; a continuous median brown vitta from the suture to base of abdomen; wings heavily marmorate with grayish brown, brown, and cream; m-cu uniting with  $M_{3+4}$  at near two-thirds the length; outer radial and medial cells of wing pale; male hypopygium with the lateral tergal lobes narrow, divergent; outer dististyle long, boomerang-shaped, with recurved black spines at tip.

*Male.*—Length, about 17 millimeters; wing, 19; antenna, about 5.

Frontal prolongation of head brownish yellow, darker laterally; nasus long and slender; palpi with basal three segments brown, the elongate terminal segment light yellow, its distal third darkened. Antennæ (male) moderately elongate, if bent backward extending about to root of halteres; scape and pedicel yellow, flagellum brownish black; longest verticils a little exceeding the segments. Front whitish; vertex buffy, with a conspicuous dark brown median stripe.

Mesonotal præscutum with the ground color light gray, with four brownish gray stripes that are narrowly margined with dark brown, the border not or scarcely involving the outer margin of the lateral stripes; additional brown lines on the humeral region and sublaterally before the suture; scutum gray, each lobe with two confluent brownish gray areas that are narrowly bordered by darker; posterior sclerites of mesonotum with a more golden yellow pollen; a continuous dark brown median line extending from the suture to the base of abdomen. Pleura heavily yellow pollinose. Halteres yellow, the knobs dark brown (distal ends broken in unique type). Legs with the coxæ grayish yellow; trochanters yellow; femora yellow basally, passing into brownish yellow, the tips black, preceded by a vague, yellow, subterminal ring; tibiæ and tarsi black. Wings (Plate 1, fig. 9) narrow, with long basal petiole; ground color grayish brown, heavily marmorate with cream-yellow and darker brown areas; cell Sc uniformly blackened, cell C pale yellow; a narrow darkening in bases of cells R and M; conspicuous dark clouds on anterior cord, outer end of cell 1st  $M_2$ , at midlength of outer radial field, and across cells R, M, Cu, and the anals; outer radial and medial cells chiefly pale, with restricted dark marginal clouds at ends of longitudinal veins; veins dark brown. Squama with setæ; very sparse trichia on vein  $R_3$ ; a series of about a score of trichia on basal fifth of vein 1st A. Venation:  $R_{1+2}$  entire;  $R_3$  rather strongly arcuate, slightly narrowing cell  $R_3$ ; m-cu at two-thirds the length of  $M_{3+4}$ .

Basal abdominal tergites brownish yellow, the basal segments blackened sublaterally; fifth and succeeding segments uniformly blackened, the eighth sternite somewhat paler. Male hypopygium (Plate 3, fig. 35) relatively small, the ninth segment considerably reduced; tergite, 9t, incompletely separated from the small sternite, 9s, by a posterior incision; basistyle very small. Ninth tergite (Plate 3, fig. 36, 9t) narrowly transverse, the caudal margin laterally produced into two slender black lobes



that are divergent and strongly upturned, the margin weakly serrulate; a low rounded lobe in the middle of the sclerite, placed farther cephalad than the lateral lobes, this cushion densely set with small black spines; behind these three lobes the narrow dorsal portion of the tergite bears long, dense, brown setæ distributed over almost the whole segment, the band of punctures narrowest on the midline. Outer dististyle (Plate 3, fig. 35, *od*) a long, gently arcuated, dark-colored rod, the apex blackened, the general shape about like a boomerang; apex of style with several recurved black spines. Inner dististyle (Plate 3, fig. 35, *id*) shorter, with heavily blackened spines at apex and at near midlength. Eighth sternite (Plate 3, fig. 36, 8s) large, sheathing the ninth; each lateral angle produced into a rounded knob that bears about a dozen long setæ, which are more or less decussate across the midline of body; caudal border of sternite, between the lobes, nearly straight, with a dense flat group of yellow setæ on either side of the midline.

*Habitat.*—China (Szechwan).

Holotype, male, Kwanhsien, altitude 2,000 to 4,000 feet, May 15 to 31, 1933 (*Graham*).

The nearest ally of the present fly is *Tipula* (*Lunatipula*) *multibarbata* Alexander (Korea), which differs conspicuously in the wing pattern, venation, and details of the male hypopygium.

**TIPULA (SCHUMMELIA) STRICTIVA** sp. nov. Plate 1, fig. 10.

General coloration of mesonotum light brown, the præscutal stripes very indistinct; hind femora chiefly black, with approximately the basal third yellow; fore femora more uniformly brown; tibiæ and tarsi black; wings strongly tinged with yellow; stigma dark brown; m-cu narrowly seamed with brown; abdominal tergites yellow, the posterior and lateral margins narrowly brown.

*Female.*—Length, about 11 millimeters; wing, 11.8.

Frontal prolongation of head relatively short, yellowish brown; palpi dark brown. Antennæ (female) with the basal three segments yellow; succeeding flagellar segments bicolorous, yellow, with the basal enlargements conspicuously black; outer flagellar segments more uniformly infumed; longest verticils unilaterally distributed, in female exceeding the segments in length. Front whitish pruinose; posterior portion of head brown.

Mesonotum light brown, the præscutal stripes very indistinct, the intermediate pair vaguely bordered by narrow darker

lines, a capillary median vitta being somewhat more evident; mediotergite sparsely pruinose. Pleura yellow. Halteres yellowish brown. Legs with the coxæ and trochanters pale yellow; femora chiefly black, the basal third or thereabouts paler; fore femora more uniformly brown; tibiæ and tarsi black. Wings (Plate 1, fig. 10) with a strong yellow tinge, the prearcular field and cell Sc more intense, clearer yellow; cell C, anterior portion of cell R and outer radial field more infumed; stigma long-oval, dark brown, preceded and followed by restricted clear yellow areas; outer medial veins, m-cu, and distal section of Cu<sub>1</sub> narrowly seamed with brown; veins yellow, darker in the clouded portions of the medial field. No macrotrichia in cells of wing. Venation: R<sub>1+2</sub> entire but pale, with trichia at proximal end only; R<sub>2</sub> subequal to R<sub>1</sub>; cell 1st M<sub>2</sub> small.

Abdominal tergites yellow, the posterior and lateral margins narrowly brown; sternites more uniformly light yellow. Cerci straight and very slender.

*Habitat*.—Formosa.

Holotype, female, Taiheizan, altitude 5,500 feet, July 8, 1934 (Gressitt).

*Tipula* (*Schummelia*) *strictiva* is most nearly allied to *T. (S.) rantaicola* Alexander, likewise of Formosa, differing in the chiefly blackened femora and the strongly yellow wings.

TIPULA SINDENSIS sp. nov. Plate 1, fig. 11; Plate 3, fig. 37.

Belongs to the *thibetana* group; allied to *griseipennis*; size small (wing, 13.5 to 14 millimeters); antennal flagellum dark brown; mesonotal præscutum light gray, with three darker gray stripes, the median one narrowly and conspicuously bordered by darker brown; femora brownish yellow, the tips narrowly blackened; wings pale grayish brown, tessellated with slightly darker brown and cream-colored areas; cell 1st M<sub>2</sub> long; abdominal tergites orange-yellow, with a conspicuous dark brown stripe on either side.

*Male*.—Length, about 13 to 13.5 millimeters; wing, 13.5 to 14.

Frontal prolongation of head relatively elongate, dark gray; nasus very small; palpi black. Antennæ with scape brownish yellow; pedicel a little clearer yellow; flagellar segments uniformly dark brown; verticils shorter than the segments. Head brownish gray.

Pronotum gray, variegated with brown medially and on the sides. Mesonotal præscutum light gray, with three darker gray

stripes, the median one narrow and conspicuously bordered for its whole length by dark brown, and very faintly and inconspicuously split medially by a dusky vitta; lateral stripes with a dark spot at cephalic end; scutal lobes light gray, variegated by dark areas; posterior sclerites of mesonotum gray. Pleura gray, the dorsopleural membrane more dusky. Halteres pale, the base of stem restrictedly pale, the knobs infuscated. Legs with the coxæ gray; trochanters obscure yellow, weakly pruinose; femora brownish yellow, the tips narrowly blackened; tibiæ yellowish brown, the tips passing into black; tarsi black, the proximal ends of basitarsi paler. Wings (Plate 1, fig. 11) pale grayish brown, tessellated with slightly darker brown and cream-yellow areas, the pattern arranged much as in *griseipennis*; veins dark brown. Venation:  $R_3$  variable in its course, in the type rather strongly upcurved at outer end, in paratype more nearly straight; posterior medial and cubital veins bent basad at margin; cell 1st  $M_2$  long, cell  $M_1$  relatively short.

Abdomen with basal tergite dark brownish gray, restrictedly variegated by pale; succeeding tergites orange-yellow, with broad, conspicuous, sublateral, brown stripes that are slightly interrupted at the posterior borders; extreme lateral margins of tergites grayish pruinose; sternites orange-yellow, darker laterally; subterminal segments brownish black, the styli yellow. Male hypopygium with the styli of peculiar conformation, as shown by the figure (Plate 3, fig. 37, *id, od*).

*Habitat*.—Kashmir.

Holotype, male, Sind Valley, altitude 7,000 feet, June 11, 1934 (*Miss Hutchinson*). Paratopotype, male.

The nearest ally of the present fly seems to be the larger *Tipula griseipennis* Brunetti, which is from the Garhwal District of India. In addition to the major size, the latter species differs especially in the bicolorous antennæ, the different pattern of the præscutum and abdomen, and the structure of the male hypopygium.

#### Genus DOLICHOPEZA Curtis

*Dolichopeza* CURTIS, British Entomology (1825) 62.

Subgenus SINOROPEZA subgenus novum

Characters as in *Oropeza* Needham, differing especially in the venation of the medial field of the wing. Wing (Plate 1, fig. 12) with  $Sc$  relatively long,  $Sc_2$  ending just before fork of  $R_s$ ; tip of  $R_{1+2}$  entirely atrophied,  $R_2$  meeting  $R_1$  at a strong angle;

Rs straight, oblique, a little longer than the basal section of  $R_{4+5}$ ; cell 1st  $M_2$  open by atrophy of basal section of vein  $M_3$ ; cell 2d  $M_2$  petiolate; cell 1st  $M_2$  confluent with cell  $M_3$ ; second section of vein  $M_{1+2}$  subequal to basal section of  $M_2$ ; m-cu more than its own length before departure of vein  $M_{3+4}$ . Subgenotype with numerous strong macrotrichia in cells  $Sc_2$  to  $M_3$ , inclusive, these lacking in *postica*.

*Type of subgenus.*—*Dolichopeza (Sinoropeza) pluricoma* sp. nov. (Eastern Palæarctic Region: Western China.)

I am referring here also *Dolichopeza postica* Brunetti (eastern Himalayas), which has an almost identical venation but lacks the macrotrichia in the cells of the wing. The venation is quite unique in the entire family Tipulidæ in that cell 2d  $M_2$  is long-petiolate by the presence of a basal section of vein  $M_2$ , producing the appearance of a posterior fork in the outer medial field.

DOLICHOPEZA (SINOROPEZA) PLURICOMA sp. nov. Plate 1, fig. 12.

General coloration of thoracic notum dark brown, the præscutum with three more reddish brown stripes; wings strongly tinged with dusky, the stigma darker; macrotrichia in outer ends of cells  $Sc_2$  to  $M_3$ , inclusive.

*Female.*—Length, about 8 millimeters; wing, 10.

Rostrum and palpi dark brown. Antennæ dark brown throughout; basal flagellar segment (female) very long, approximately equal in length to the succeeding two and one-half segments; verticils much shorter than the segments. Head dark brown.

Mesonotum dark brown, the præscutum with three slightly brighter, more reddish brown stripes; posterior sclerites of mesonotum and the pleura rather uniformly dark brown. Halteres dusky, the extreme base of stem brightened. Legs with the coxæ dark brown; trochanters obscure yellow; femora obscure yellow basally, the tips passing into brownish black; tibiæ and basitarsi brown, the tips brownish black; outer tarsal segments black. Wings (Plate 1, fig. 12) with a strong dusky tinge; stigma oval, dark brown; a restricted brown cloud on anterior cord; veins  $R_{4+5}$ ,  $Cu_1$ , and 2d A narrowly seamed with brown; pale areas before and beyond the stigma poorly defined; veins and macrotrichia dark brown. Macrotrichia in outer radial and medial cells of wing (shown in figure by stippled dots), beginning as single lines in the more basal portions of the cells, becoming more numerous and crowded in the outer portions. Venation as

discussed under the characterization of the subgenus; cell 2d A relatively wide.

Abdomen brown, the incisures somewhat darker. Ovipositor with all but the extreme bases of valves broken, but from what remains apparently of somewhat peculiar structure.

*Habitat.*—China (Szechwan).

Holotype, female, Beh Luh Din, 30 miles north of Chengtu, altitude 6,000 feet, August 25, 1933 (*Graham*).

The species needs comparison only with *Dolichopeza* (*Sinoropeza*) *postica* Brunetti, which is readily told by the glabrous cells of the wing.

#### CYLINDROTOMINÆ

CYLINDROTOMA AURANTIA sp. nov. Plate 1, fig. 13.

Entire thorax fiery orange; legs black, the extreme bases of femora obscure yellow; wings strongly suffused with black, cells C and Sc a little darker; abdomen with basal tergite yellow, the remainder of abdomen black.

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

Rostrum and palpi black. Antennæ black throughout. Head black, the anterior vertex and posterior orbits obscure yellow; anterior vertex unusually wide.

Entire thorax, including notum and pleura, fiery orange, unmarked. Halteres black, the base of stem restrictedly yellow. Legs with the coxæ and trochanters orange; femora black, the extreme bases obscure yellow; remainder of legs black. Wings (Plate 1, fig. 13) strongly suffused with black, cells C and Sc a little darker; stigma relatively small, still deeper black; no further darkenings at origin of Rs or along cord; veins black. Venation: m-cu more than its length beyond fork of M; petiole of cell  $M_1$  short, much less than m.

Abdomen with basal tergite yellow; remainder of abdomen, including the genital segments, black, the outer segments weakly pruinose.

*Habitat.*—China (Szechwan).

Holotype, female, Beh Luh Din, 30 miles north of Chengtu, altitude 6,000 feet, August 24, 1933 (*Graham*). Paratype (sex?), Wei Chow, 65 miles northwest of Chengtu, altitude 9,000 to 12,500 feet, August 15, 1933 (*Graham*).

*Cylindrotoma aurantia* is most nearly allied to *C. rufescens* Edwards (Tibet), differing very conspicuously in the entirely orange thorax and, beyond the basal segment, the entirely black

abdomen. The black legs are much as in the otherwise distinct *C. nigripes* Alexander (Szechwan-Tibet border). It should be noted that the wings of the type appear to be stained or discolored with a bluish or purplish tinge that does not show in the broken paratype and is undoubtedly abnormal for the species.

#### LIMONIINÆ

##### LIMONIINI

*LIMONIA* (LIBNOTES) *IMMETATA* sp. nov. Plate 1, fig. 14; Plate 3, fig. 38.

Allied to *familiaris*; antennæ black, the flagellar segments with unusually long verticils; head plumbeous gray; eyes virtually contiguous on vertex; mesothorax uniformly light orange-yellow, the mesonotum unmarked; knobs of halteres infuscated; wings whitish, the prearcular and costal regions yellow; a restricted brown pattern;  $Sc_1$  long; male hypopygium with the tergal lobes bearing long setæ.

*Male*.—Length, about 8.5 millimeters; wing, 9.5.

Rostrum brownish yellow; palpi black. Antennæ black throughout, the scape a little pruinose; flagellar segments long-oval to subcylindrical, the longest verticils of unusual length, between three and four times as long as the segments; terminal segment elongate, narrowed at tip, approximately one-half longer than the penultimate. Head dark plumbeous gray; anterior vertex reduced to a mere strip or with the eyes actually contiguous.

Pronotum brown. Mesonotum uniformly light orange-yellow, unmarked, the pleura a little more yellowish. Halteres pale, the knobs infuscated. Legs with the coxæ and trochanters pale yellow; femora yellow, the tips weakly darkened; tibiæ and tarsi obscure yellow, the outer tarsal segments dark brown. Wings (Plate 1, fig. 14) whitish, the prearcular region and cells C and  $Sc$  clearer yellow; a sparse brown pattern, including the stigma; a large area at origin of  $R_s$  and smaller marks at arculus; wing tip in outer radial field vaguely darkened; a very restricted dark seam on cord, more evident at the fork of  $R_s$ ; narrow clouds along vein  $Cu$  and as a marginal seam to just beyond vein  $Cu_1$ ; veins dark brown, brighter in the flavous areas. Venation:  $Sc$  long,  $Sc_1$  ending beyond  $r-m$ ,  $Sc_2$  some distance from its tip, just beyond fork of  $R_s$ ,  $Sc_1$  exceeding one-half the length of  $R_s$ ; outer radial veins strongly decurved towards outer ends; cell 1st  $M_2$  relatively small;  $m-cu$  not far beyond fork of  $M$ , subequal to the distal section of  $Cu_1$ ; anal veins gently divergent.

Abdominal tergites dark brown, narrowly paler on lateral borders; sternites brownish yellow; hypopygium yellow. Male hypopygium (Plate 3, fig. 38) with the tergite, 9*t*, long, the caudal margin with a broad U-shaped notch, the lateral lobes with long conspicuous setæ that are virtually lacking elsewhere on tergite. Ventral dististyle, *vd*, fleshy, the rostral prolongation blackened, with two spines of very unequal size, the inner one a mere seta. Gonapophyses, *g*, with mesal-apical lobe slender, blackened, the inner or concave margin with microscopic spines.

*Habitat*.—Formosa.

Holotype, male, Rokki, altitude 1,000 feet, May 17, 1934 (*Gressitt*).

The present species is allied to *Limonia* (*Libnotes*) *clitelligera* (Alexander), likewise of Formosa, differing especially in the coloration of the thorax. By Edwards's key to the species of *Libnotes*<sup>2</sup> the fly runs to couplet 57, disagreeing with all species beyond this point in the immaculate mesonotum.

LIMONIA (LIMONIA) TUTA sp. nov. Plate 1, fig. 15.

General coloration of mesonotum brown medially, paling to yellow on sides; knobs of halteres darkened; legs brownish yellow, the outer tarsal segments darkened; wings with a faint brown tinge, the short-oval stigma darker brown; cell 1st  $M_2$  open by the atrophy of basal section of vein  $M_3$ ; abdominal tergites dark brown; cerci slender, gently upcurved to the acute tips.

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

Rostrum and palpi pale brown, greatly reduced. Antennæ with scape and pedicel black; flagellum broken. Head dark gray; eyes contiguous on anterior vertex.

Pronotum brownish black. Mesonotal præscutum brown medially, obscure yellow on sides, the extreme lateral border of sclerite darkened before the suture; scutal lobes dark brown, the median area pale; scutellum and mediotergite yellowish brown. Pleura yellow, with a conspicuous, dark brown, longitudinal stripe extending from the propleura across the anepisternum, pteropleurite, and pleurotergite to the base of abdomen; dorsopleural membrane obscure yellow; sternopleurite clearer yellow. Halteres pale, the knobs darkened. Legs with the coxæ

<sup>2</sup>Journ. Fed. Malay St. Mus. 14 (1928) 74-80.

pale yellow, the fore coxæ a trifle more darkened; trochanters yellow; remainder of legs pale brownish yellow, the outer tarsal segments brown. Wings (Plate 1, fig. 15) with a faint brown tinge, the short-oval stigma darker brown; veins brown. Macrotrichia of veins beyond origin of Rs relatively long and conspicuous; a restricted series of trichia at outer ends of both anal veins. Venation:  $Sc_1$  ending shortly beyond midlength of Rs,  $Sc_2$  a short distance from its tip; free tip of  $Sc_2$  and  $R_2$  in transverse alignment; cell 1st  $M_2$  open by the atrophy of basal section of vein  $M_3$ ; m-cu close to fork of M, considerably exceeding the distal section of  $Cu_1$ ; anal veins at origin nearly parallel.

Abdominal tergites dark brown, the sternites somewhat paler. Cerci slender, gently upcurved to the acute tips, exceeding the hypovalvæ in length.

*Habitat*.—Formosa.

Holotype, female, Hassensan, altitude 4,900 feet, June 27, 1934 (*Gressitt*).

*Limonia (Limonia) tuta* is very different from other regional species in having cell 1st  $M_2$  of the wings open by the atrophy of the basal section of vein  $M_3$ . This is a very uncommon feature in the entire genus. The Philippine *L. (L.) bagobo* Alexander, which has a somewhat similar venation, is in all other regards a very different fly.

LIMONIA (RHIPIDIA) SYNPILOTA sp. nov. Plate 1, fig. 16; Plate 3, fig. 39.

Belongs to the *maculata* group; general coloration gray, the præscutum with a brown median stripe; antennæ (male) with nine bipectinate flagellar segments; wings whitish, with an abundant gray dotting in cells; a heavier costal pattern, the area at tip of Sc and origin of Rs common; Sc relatively short; male hypopygium with the rostral prolongation of the ventral dististyle with two long slender spines close to extreme tip.

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

*Female*.—Length, 7.5 to 8 millimeters; wing, 8.5 to 9.

Rostrum and palpi dark brown. Antennæ (male) black, the apical pedicels of flagellar segments whitish; flagellar segments two to ten, inclusive, bipectinate, the longest branches more than twice the segments; branches of flagellar segment two a little exceeding the segments; branches of flagellar segment ten relatively short, somewhat unequal in length; flagellar segment eleven with a single branch that is about as long as the segment;



terminal segment simple; in female, flagellar segments long-oval. Head dark gray.

Mesonotal præscutum gray, with a brownish median stripe that does not quite reach the suture; remainder of notum gray, the scutal lobes variegated with darker. Pleura dark gray. Halteres pale yellow. Legs with the coxæ brownish gray, paler at tips; trochanters yellow; femora yellow, the tips conspicuously dark brown; tibiæ and basitarsi yellow, the tips narrowly and weakly darkened; outer tarsal segments passing into black. Wings (Plate 1, fig. 16) whitish, all cells with numerous pale gray clouds; a series of four larger and darker costal areas, the third a common one over the tip of Sc and origin of Rs; cord and outer end of cell 1st M<sub>2</sub> seamed with grayish brown; a large rounded spot at outer end of vein 2d A; veins pale, darker in the clouded areas. Venation: Sc short, Sc<sub>1</sub> ending about opposite one-fourth to one-fifth the length of Rs, Sc<sub>2</sub> near its tip; a supernumerary crossvein in cell Sc; m-cu some distance before the fork of M.

Abdomen dark brown, the sternites in male slightly paler. Male hypopygium (Plate 3, fig. 39) with the tergite, 9*t*, transverse, narrowed posteriorly, its caudal margin very gently emarginate. Basistyle, *b*, with a single simple ventromesal lobe. Ventral dististyle, *vd*, fleshy, the rostral prolongation with two long slender spines placed almost at extreme tip, these spines subequal in length to the prolongation itself, the outer spine a trifle longer than the inner. Gonapophyses, *g*, with the mesal-apical lobe simple, the tip blackened, acute.

*Habitat*.—Kashmir.

Holotype, male, Kaj-Nag Range, altitude 8,000 feet, May 26, 1934 (*Miss Hutchinson*). Allotopotype, female, pinned with type. Paratopotypes, 1 female, pinned with type; 1 female, May 22, 1934; 1 female, altitude 9,000 feet, June 3, 1934.

The present fly is closest to *Limonia* (*Rhipidia*) *subtesselata* (Brunetti) and *L. (R.) antennata* (Brunetti), being readily told by the nature of the pectinations of the antennæ and the bipinuous rostral prolongation of the male hypopygium. Both Brunetti's description and Bagchi's figure of the antenna of *antennata* indicate that all twelve of the flagellar segments are bipectinate, a condition that if true is unique in the genus. Edwards's

rediscussion of the type<sup>3</sup> makes no mention of the antennal characters but merely compares the fly with *subtesselata*.

**DICRANOPTYCHA VULPES** sp. nov. Plate 1, fig. 17.

General coloration of thorax light yellowish brown, without markings; antennal scape and pedicel yellow, flagellum black; legs yellow, the outer tarsal segments brownish black; wings uniformly suffused with bright fulvous; Rs subequal in length to cell 1st M<sub>2</sub>.

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

Rostrum brown; palpi dark brown. Antennæ with scape and pedicel yellow, flagellum black; segments subcylindrical, with verticils that exceed the segments in length. Head brown, sparsely yellow pollinose.

Mesonotum and pleura uniformly light yellowish brown, without markings. Halteres pale throughout. Legs with the coxæ and trochanters yellow; femora yellow, a little brighter on basal portion; tibiæ and basitarsi yellow, the tips of latter and succeeding segments brownish black. Wings (Plate 1, fig. 17) uniformly suffused with bright fulvous, the veins slightly more brownish yellow. Venation: Rs subequal in length to cell 1st M<sub>2</sub>; m-cu a little less than its length beyond fork of M.

Abdominal tergites obscure yellow medially, bordered laterally with brown; sternites yellow, more or less darkened medially.

*Habitat*.—China (Szechwan).

Holotype, female, Beh Luh Din, 30 miles north of Chengtu, altitude 6,000 feet, August 18 and 19, 1933 (*Graham*). Paratopotypes, 2 females, August 18 to 25, 1933.

*Dicranoptycha vulpes* is very different from all other regional described species in the bright fulvous color of the wings, which is almost exactly like that of the larger Eastern Nearctic *D. germana* Osten Sacken, type of the genus. The genus *Dicranoptycha* is new to the fauna of China.

#### PEDICIINI

**NIPPONOMYIA SZECHWANENSIS** sp. nov. Plate 1, fig. 18; Plate 3, fig. 40.

Mesonotum reddish brown, unmarked; legs yellow; wings with a faint brownish yellow tinge, with the usual yellow, brown-margined costal pattern; no black costal dashes; cell 1st M<sub>2</sub> closed; m transverse; male hypopygium with the dististyle having only three or four spines.

<sup>3</sup> Rec. Indian Mus. 26 (1924) 297.

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

Rostrum and palpi brownish black. Antennæ brownish yellow, with only the outer flagellar segments slightly darker. Head brownish yellow, the vertex sparsely pruinose.

Mesonotum reddish brown, the surface subnitidous; præscutum without black markings as is the case in all other regional members of the genus; central portion of præscutum, on anterior half, a little infumed. Pleura yellow. Halteres yellow throughout. Legs yellow, the terminal two tarsal segments dark brown. Wings (Plate 1, fig. 18) with a faint brownish yellow tinge, with the usual yellow, brown-margined costal pattern of the genus; costal cell without black transverse lines; outer radial field darkened; very narrow brown seams at origin of  $R_s$ , along cord, at fork of  $R_s$ , and on crossvein  $m$ ; veins dark brown. Venation:  $r-m$  about its own length before the fork of  $R_s$ , the latter branching almost simultaneously into three;  $R_{2+3}$  perpendicular at origin, lying most closely to  $R_1$  at bend and again at fork; cell  $R_4$  widest just beyond midlength;  $m$  present, transverse.

Abdominal segments bicolorous, the basal ring darker just beyond its proximal end, the outer end and incisures pale. Male hypopygium (Plate 3, fig. 40) with the dististyle,  $d$ , terminating in only three or four spines.

*Habitat*.—China (Szechwan).

Holotype, male, Kwanhsien, altitude 2,000 to 4,000 feet, May 15 to 31, 1933 (*Graham*).

The genus *Nipponomyia* had not before been recorded from China. *Nipponomyia szechwanensis* is very different from the other known species. The unmarked mesonotum is much like that found in *flavicollis*, but in all other respects the two flies are entirely different. The known species of the genus may be separated by means of the accompanying key.

*Key to the species of Nipponomyia Alexander.*

1. Thoracic dorsum without black spots on mesonotal præscutum and scutum ..... 2.
- Thoracic dorsum with polished black spots on præscutum and scutum.. 3.
2. Tips of femora and tibiæ narrowly darkened; wings with the yellow costal pattern pale, interrupted by four or five large brown areas. (North Borneo.) ..... *flavicollis* Edwards.
- Femora and tibiæ uniformly yellow; wings with yellow costal pattern deep and conspicuous, interrupted only by small, inconspicuous spots. (Western China.) ..... *szechwanensis* sp. nov.

3. A series of black transverse dashes in costal cell of wing..... 4.  
 Costal cell of wing without black dashes..... 6.
4. Wings with cell 1st  $M_2$  open by atrophy of  $m$ ; dististyle of male hypopygium with about twelve black spines. (Japan.)  
*kuwanai* (Alexander).  
 Wings with cell 1st  $M_2$  normally closed; dististyle of male hypopygium with only two or three black spines..... 5.
5. Legs yellow; wings with  $m$  transverse. (Formosa.)  
*symphyletes* (Alexander.)  
 Legs with tips of femora and tibiæ blackened, wings with  $m$  present or lacking; when present, very oblique in position, ending almost at tip of vein  $M_3$ . (Northern India.).... *novem-punctata* (Senior-White).
6. Legs yellow; a series of about nine small black spots on mesonotal præscutum and scutum; wings without large dark clouds at  $Sc_2$ , origin of  $Rs$ , and tip of vein 2d A;  $m$  very oblique, its outer end lying far out on vein  $M_3$ . (Japan.)..... *trispinosa* (Alexander).  
 Legs with femora tipped with brown; mesonotal præscutum with two large black areas at posterior end; scutum almost uniformly black; wings with large dark clouds at  $Sc_2$ , origin of  $Rs$ , and tip of vein 2d A;  $m$  slightly oblique, shorter than the distal section of vein  $M_3$ . (Sumatra.) ..... *sumatrana* (de Meijere).

ULA COMES sp. nov. Plate 1, fig. 19.

Mesonotum brownish black, sparsely pruinose; antennæ elongate, flagellum black; pleura and pleurotergite variegated black and yellow; wings yellow, heavily patterned with brown; cell 1st  $M_2$  unusually large, subequal in length to vein  $M_4$ ; abdominal tergites, including the genital shield, black.

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

Rostrum brown; palpi brownish black. Antennæ elongate; scape and pedicel yellow, flagellum black; flagellar segments cylindrical, the longest verticils a little exceeding the segments. Head gray.

Mesonotal præscutum brownish black, sparsely pruinose; scutum and scutellum more pruinose; mediotergite brownish gray. Pleura with the anepisternum and sternopleurite brownish gray, the pteropleurite and pleurotergite yellow, the latter lined with black on the more ventral portions adjoining the root of halteres. Halteres yellow, the knobs dark brown. Legs with the coxæ yellow; trochanters yellow; femora brownish yellow, the tips narrowly dark brown; tibiæ brownish yellow, the tips narrowly brownish black; tarsi black. Wings (Plate 1, fig. 19) yellow, the stigmal area clearer yellow; an unusually heavy brown pattern, including spots at origin of  $Rs$ ,  $Sc_2$  and  $R_2$  and seams along cord and outer end of cell 1st  $M_2$ ; restricted dusky clouds at ends of outer radial veins; wing apex very narrowly bordered

with brown; narrow dusky washes along vein M and along both anal veins, that at 2d A not quite touching the vein; dark seam at cord entirely crossing wing from  $Sc_1$  to  $Cu_1$ ; veins brown, somewhat darker in the clouded areas. Macrotrichia of cells abundant (in figure, represented by stippled dots). Venation: r-m connecting with Rs at its fork, in alignment with  $R_5$ ; cell 1st  $M_2$  unusually long, subequal to vein  $M_4$ ; m-cu shortly beyond fork of M.

Abdominal tergites black; sternites obscure brown, the outer segments blackened; genital shield chiefly black; cerci strongly upcurved, compressed, brownish black; hypovalvæ white.

*Habitat*.—China (Szechwan).

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

*Ula comes* is most generally similar to *U. superelegans* Alexander (Formosa), which has a somewhat similar heavy wing pattern but with the details distinct, and with cell 1st  $M_2$  much smaller, in length not exceeding two-thirds vein  $M_4$ . The genus is new to the Chinese Republic.

#### HEXATOMINI

EPIPHRAGMA (EPIPHRAGMA) BICINCTIFERA sp. nov. Plate 1, fig. 20; Plate 3, fig. 41.

Mesonotal præscutum dark brown, with four reddish brown stripes on the anterior part of sclerite; antennæ relatively long; femora yellow, each with two conspicuous black rings, remainder of legs yellow; wings whitish, with a buffy brown pattern that is bordered by darker brown; m-cu a little more than one-half its length beyond the fork of M; male hypopygium with the interbase long and filiform.

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

*Female*.—Length, about 10 millimeters; wing, 11.

Rostrum brown above, paler laterally; palpi black. Antennæ with the scape dark brown; pedicel a little paler; first flagellar segment yellow, succeeding segments dark brown, with long conspicuous verticils that exceed the segments. Head deep brown, the front and posterior orbits obscure yellow, the latter with a silvery pruinosity.

Mesonotal præscutum dark brown, with four reddish brown stripes in front and at midlength of the segment; posterior third or more of sclerite more uniformly dark brown; posterior margins of præscutum, behind the pseudosutural foveæ, darker brown; scutal lobes chiefly dark brown; scutellum dark brown;

mediotergite dark brown laterally and on posterior portion, the anterocentral portion gray pruinose. Pleura obscure brownish yellow, narrowly lined longitudinally with brown, including a more-dorsal stripe from the propleura to the base of halteres, and a more-ventral area including the ventral sternopleurite and meron. Halteres obscure yellow, the base of stem and apex of knob pale. Legs with the coxæ and trochanters pale; femora yellow, each with two conspicuous black rings, the first immediately distad of midlength, the second subapical, a trifle wider than the yellow apex; tibiæ and tarsi yellow, only the last tarsal segment darkened. Wings (Plate 1, fig. 20) whitish, with a handsome buffy brown pattern that is bordered by darker brown, the areas in the cubital and anal cells more solidly brown; seam on supernumerary crossvein in cell C isolated from other dark markings; the pattern is much as in *ornatipennis* (Brunetti), as figured by Brunetti,<sup>4</sup> but the dark areas beyond cord more broken. Venation: r-m variable in length, from very short (as shown) to normal; m-cu a little more than one-half its length beyond fork of M.

Abdominal tergites dark brown, the caudal borders narrowly yellow; sternites yellow, a little infumed at the incisures; hypopygium brownish black. Male hypopygium (Plate 3, fig. 41) with the outer dististyle, *od*, relatively long and slender. Interbase, *i*, a long, slender, filiform rod, the surface smooth, without transverse or oblique grooves on surface near tip, as is the case in *subinsignis* and allies.

*Habitat*.—China (Szechwan).

Holotype, male, Beh Luh Din, 30 miles north of Chengtu, altitude 6,000 feet, August 27, 1933 (*Graham*). Allotopotype, female, September 1, 1933. Paratopotype, male, August 18, 1933.

*Epiphragma* (*Epiphragma*) *bicinctifera* is very different from other regional species of the genus in the conspicuously bianulate femora. It is most generally similar to species such as *E. (E.) subinsignis* Alexander, but amply distinct in the coloration and details of structure of the male hypopygium. The genus *Epiphragma* had not been recorded from China.

#### Genus GRAHAMOMYIA novum

Palpi 4-segmented. Antennæ 16-segmented, all segments distinct; outer flagellar segments gradually smaller, the last longer

<sup>4</sup> Rec. Indian Mus. 15 (1918) pl. 7, fig. 5, as *Limnophila*.

than the penultimate. Anterior vertex relatively wide, approximately twice the diameter of the scape. Tuberculate pits and pseudosutural foveæ lacking. Tibial spurs small but distinct. Wings (Plate 1, fig. 21) with Sc long, Sc<sub>1</sub> ending some distance beyond fork of Rs, Sc<sub>2</sub> not far removed from its tip; R<sub>2</sub> lacking; petiole of cell R<sub>3</sub> subequal in length to the cell; a supernumerary crossvein at about its own length beyond origin of vein R<sub>4</sub>, connecting this vein with vein R<sub>5</sub>, forming a closed cell 1st R<sub>4</sub> that is very similar in size and outline to cell 1st M<sub>2</sub>; basal section of R<sub>5</sub> more or less reduced; Rs long, square and long-spurred at origin; cell M<sub>1</sub> lacking; m-cu at or before midlength of M<sub>3+4</sub>; anterior arcullus broken. Male hypopygium (Plate 3, fig. 42) massive, cylindrical, the tergite, 9t, and sternite, 9s, fused, the basistyle, b, incompletely separated from the sternite by a suture, the general structure of the hypopygium not unlike that of the tipuline crane flies. Ovipositor with the cerci and hypoalvæ subequal in length and of approximately similar form, the margins of both valves entire.

*Genotype*.—*Grahamomyia bicellula* sp. nov. (Palæarctic Region: Western China.)

I take very great pleasure in dedicating this new group of crane flies to the collector of the type species, the Rev. Mr. David C. Graham, who has added very materially to our knowledge of the tipulid fauna of western China. The nearest ally is undoubtedly *Phyllolabis* Osten Sacken, which differs especially in the venation and different structure of the male hypopygium. The presence of a supernumerary crossvein in cell R<sub>4</sub>, connecting veins R<sub>4</sub> and R<sub>5</sub> to form a second closed or discal cell, 1st R<sub>4</sub>, is quite unique in the entire family Tipulidæ. It is approached only by *Cyttaromyia* Scudder, a cylindrotomine genus, which has a supernumerary crossvein in cell R<sub>5</sub>, connecting posteriorly with vein M<sub>1</sub> to form a second discal cell, 1st R<sub>5</sub>, immediately cephalad of and in contact with the normal cell, 1st M<sub>2</sub>. The location of the supernumerary crossvein in cell R<sub>4</sub>, forming cells 1st R<sub>4</sub> and 2d R<sub>4</sub>, is quite as in the lower brachycerous dipteran families where this condition occurs (certain Asilidæ, Nemestrinidæ, and Bombyliidæ), as discussed in another paper.<sup>5</sup>

<sup>5</sup> Alexander, C. P., A comparison of the systems of nomenclature that have been applied to the radial field of the wing in the Diptera, Proc. IV. Internat. Congress Ent. for 1928 2 (1929) 700-707, 3 pls.

**GRAHAMOMYIA BICELLULA** sp. nov. Plate 1, fig. 21; Plate 3, fig. 42.

General coloration of thorax yellow; abdomen yellow, the outer segments black; femora black, tibiæ brown; wings strongly tinged with yellow.

*Male*.—Length, about 7.5 millimeters; wing, 8.5 to 9.

*Female*.—Length, about 7.5 millimeters; wing, 10.

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

Pronotum and mesonotum almost uniformly yellow, the præscutum in front slightly more brownish yellow. Pleura yellow, the ventral sternopleurite brownish black, sparsely pruinose. Halteres pale yellow, the apices of the knobs weakly darkened. Legs with the fore and middle coxæ weakly darkened, the posterior coxæ yellow; trochanters yellow; femora black; tibiæ brown, the fore pair much darker than the posterior tibiæ; tarsi black. Wings (Plate 1, fig. 21) strongly tinged with yellow, the stigmal area clearer yellow, faintly encircled by dusky; virtually all longitudinal veins very narrowly bordered by dusky, especially 2d A; veins dark, C and Sc yellow. Venation as discussed under the genus.

Abdomen (male) with basal seven segments chiefly light yellow; remaining segments, including the massive hypopygium, black. In the female, the outer three segments blackened; ovipositor with yellow valves. Male hypopygium (Plate 3, fig. 42) unusually large and massive, the ninth segment appearing as a blackened cylinder, with the tergite and sternite fused; basistyle deeply embedded in the sternite, the suture not clear, but indicated by an impressed line; caudal margin of tergal region emarginate. A semipendant fleshy lobe, *m*, from the membrane at ventral suture of the basistyle.

*Habitat*.—China (Szechwan).

Holotype, male, Wei Chow, 65 miles northwest of Chengtu, altitude 15,200 feet, August 14, 1933 (*Graham*). Allotopotype, female, altitude 9,000 to 12,500 feet, August 15, 1933. Paratopotype, male, with the allotype.

The further unique characters of this insect have been discussed under the generic characterization.

#### ERIOPTERINI

**CRYPTERIA SPECTRALIS** sp. nov. Plate 1, fig. 22; Plate 3, fig. 43.

General coloration almost white; antennal scape and pedicel dark brown, flagellum white; præscutum with a dark brown pat-



tern; legs white, the tips of the femora and tibiæ conspicuously brownish black; sclerites of leg with long, conspicuous, erect setæ; wings whitish subhyaline, with a restricted but very conspicuous dark brown pattern; Rs nearly square at origin; abdomen yellowish white, the genital segment and a spot on tergite four black.

*Male*.—Length, 5 to 5.5 millimeters; wing, 7 to 7.5.

*Female*.—Length, 6 to 6.5 millimeters; wing, 7 to 7.5.

Rostrum and palpi dark brown. Antennæ short in both sexes; scape and pedicel dark brown; flagellum whitish; antennæ with nine free flagellar segments beyond the elongate fusion segment; flagellar verticils much longer than the segments. Head light ashen gray.

Pronotum whitish. Mesonotal præscutum whitish, with a peculiar and very conspicuous dark brown pattern, including a pair of oval spots at near midlength of the segment, one on either side of the median line, and a broad sublateral area that extends behind onto the lateral border of the scutum and as a short spur along the suture; posterior sclerites of notum white. Pleura white. Halteres yellowish white throughout. Legs with the coxæ and trochanters white; fore femora and tibiæ snowy white, the tips broadly and conspicuously brownish black, the amount subequal on the two segments; on middle and posterior legs, the femoral tips are narrowly and less conspicuously darkened, the tibial tips similarly darkened, the latter area approximately twice as extensive as the former; tarsi snowy white, the outer segments dark brown; segments of leg with very long, outspreading setæ, white on the pale areas, dark brown on the darkened portions. Wings (Plate 1, fig. 22) whitish subhyaline, restrictedly but very strikingly patterned with dark brown, including a spot at origin of Rs and along the cord, more expanded on anterior cord; much narrower dark seams on Sc<sub>2</sub>, R<sub>2</sub>, and m; veins white, brownish black in the darkened areas. Macrotrichia of veins long and conspicuous. Venation: Sc<sub>1</sub> ending just before R<sub>2</sub>, Sc<sub>2</sub> just beyond fork of Rs; Rs long, nearly square at origin; R<sub>1+2</sub> elongate, considerably longer than R<sub>2+3+4</sub>; R<sub>2+3</sub> subequal to m-cu; cell M<sub>1</sub> short-petiolate; m-cu at or close to fork of M; vein 2d A very long, ending at near midlength of the wing, which is widest at this point.

Abdomen yellowish white, the genital segments in both sexes blackened; posterior borders of the segments narrowly more whitish; a velvety black spot covers most of disk of the fourth

tergite. Male hypopygium (Plate 3, fig. 43) with the basistyle, *b*, cylindrical, simple; outer dististyle, *od*, slender, the tip decurved into a slender spine; outer margin before apical spine with four or five slender appressed spines; inner dististyle, *id*, a little longer than the outer, very gradually narrowed outwardly. Gonapophyses, *g*, small, blackened, gently curved, the tips bifid, the outer spine a little larger and more powerful than the inner. *Ædeagus* small.

*Habitat*.—China (Szechwan).

Holotype, male, Beh Luh Din, 30 miles north of Chengtu, altitude 6,000 feet, September 1, 1933 (*Graham*). Allotopotype, female. Paratopotypes, 7 males and females, August 16 to September 1, 1933.

The genus had not been recorded from China. This striking spectral insect requires no comparison with any described crane fly. I refer it to *Crypteria* chiefly on the venation, as the elongate vein 2d A and the position of m-cu. The only regional *Crypteria* is *C. claripennis* (Brunetti), readily told from the present fly by the entirely clear wings. The genera and subgenera of the Claduraria are now highly involved and our conceptions of the interrelationships will surely be changed as further types are discovered. The most recent general discussion is by Soot-Ryen,<sup>6</sup> which gives an excellent account of our present knowledge of the group.

**RHABDOMASTIX (SACANDAGA) HOLOMELANIA sp. nov. Plate 1, fig. 23.**

General coloration black, the thorax sparsely pruinose; antennæ, halteres, and legs black throughout; wings with a strong dusky tinge, the stigma poorly indicated, a little darker than the ground color; macrotrichia lacking on *Rs*, *R*<sub>2+3+4</sub>, *R*<sub>3</sub>, and *R*<sub>4</sub>; *Sc*<sub>1</sub> ending opposite midlength of *Rs*; m-cu beyond midlength of cell 1st *M*<sub>2</sub>.

*Male*.—Length, 4.2 to 4.4 millimeters; wing, 4.8 to 5.

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

Rostrum and palpi black. Antennæ relatively short in both sexes, if bent backward not attaining the wing root; flagellar segments oval. Head black.

Entire thorax, including pleura, black, the surface sparsely pruinose. Halteres black throughout. Legs black. Wings (Plate 1, fig. 23) with a strong dusky tinge; stigma poorly in-

<sup>6</sup> Diptera from Arctic Siberia. The Norwegian North Polar Expedition with the "Maud." 1918-1925, Scientific results 5 No. 5 (1928) 4-6.

licated, a little darker than the ground color; veins dark brown. Macrotrichia lacking on veins  $R_s$ ,  $R_{2+3+4}$ ,  $R_3$ , and  $R_4$ , excepting an occasional one on the last vein. Venation:  $Sc_1$  ending about opposite midlength of  $R_s$ ,  $Sc_2$  a short distance from its tip;  $R_3$  suberect, approximately twice its length beyond tip of  $R_{1+2}$ ;  $R_4$  arcuated, subequal in length to petiole of cell  $R_3$ ; m-cu at from beyond midlength to near two-thirds the length of cell 1st  $M_2$ .

Abdomen black throughout.

*Habitat*.—China (Szechwan).

Holotype, male, Kwanhsien, altitude 2,000 to 4,000 feet, May 15 to 31, 1933 (*Graham*). Allotopotype, female. Paratopotypes, 2 males.

*Rhabdomastix* (*Sacandaga*) *holomelania* is most nearly allied to *R. (S.) minicola* Alexander (western China), which has the venation somewhat similar, differing in the uniformly blackened halteres of the present insect and in certain venational details, as the relation of vein  $R_3$  to the tip of  $R_{1+2}$  and the position of m-cu some distance beyond midlength of cell 1st  $M_2$ .

**MOLOPHILUS NIGROPOLITUS** sp. nov. Plate 1, fig. 24; Plate 3, fig. 44.

Belongs to the *gracilis* group and subgroup; allied to *albibasis*; thorax and abdomen polished black; head dull gray; wings white, the prearcular field light yellow: vein 2d A short, ending approximately opposite the origin of  $R_s$ ; male hypopygium with the tergite conspicuous, its apical portion narrowed into a depressed lobe, the margin of which is evenly, microscopically serrulate.

*Male*.—Length, 3.8 to 4.2 millimeters; wing, 4.6 to 5.

Rostrum and palpi black. Antennæ short, if bent backward not attaining the wing root, black throughout. Head uniformly dull gray.

Thorax uniformly polished black, only the restricted anterolateral pretergites and the dorsopleural membrane yellow. Halteres white, the knobs weakly more yellowish. Legs with the coxæ blackened; trochanters obscure yellow; femora black, their bases yellow, involving the basal fourth or approximately so; remainder of legs black. Wings (Plate 1, fig. 24) white, the prearcular field light yellow; veins conspicuous, dark brown. Venation:  $Sc_1$  ending opposite  $R_2$ ,  $Sc_2$  only a short distance beyond origin of  $R_s$ ; petiole of cell  $M_3$  about twice the gently sinuous m-cu; vein 2d A short, ending opposite, or just beyond, origin of  $R_s$ .

Abdomen, including hypopygium, polished black. Male hypopygium (Plate 3, fig. 44) with the tergite, 9*t*, conspicuous, the apical portion strongly narrowed into a depressed lobe, its margin evenly and microscopically serrulate; surface of tergite at base of lobe with long conspicuous setæ that exceed the lobe in length. Dorsal lobe *db*, of basistyle with apex very strongly curved upon itself to form an almost complete turn, the apex a slender black spine, with conspicuous pale membrane at base of spine. Inner dististyle, *id*, with the two arms long and slender.

*Habitat*.—China (Szechwan).

Holotype, male, Kwanhsien, altitude 2,000 to 4,000 feet, May 15 to 31, 1933 (*Graham*). Paratopotype, male.

The nearest known ally of the present fly is *Molophilus albibasis* Alexander (Saghalien), which is readily told by the less-polished body coloration, the uniformly blackened legs, and the distinct male hypopygium. I have illustrated the latter for comparison with the present fly (Plate 3, fig. 45). Note the difference in the conformation of the tergal lobe, which is expanded at apex and with the margin coarsely and irregularly serrate.

## ILLUSTRATIONS

[Legend: *b*, Basistyle; *d*, dististyle; *db*, dorsal lobe of basistyle; *g*, gonapophysis; *i*, interbase; *id*, inner dististyle; *m*, median appendage of ninth sternite; *od*, outer dististyle; *s*, sternite; *t*, tergite; *vd*, ventral dististyle.]

### PLATE 1

- FIG. 1. *Trichocera sapporensis* sp. nov.; venation.  
2. *Trichocera szechwanensis* sp. nov.; venation.  
3. *Tipula (Vestiplex) optanda* sp. nov.; venation.  
4. *Tipula (Vestiplex) immota* sp. nov.; venation.  
5. *Tipula (Oreomyza) coxitalis* sp. nov.; venation.  
6. *Tipula (Oreomyza) sternotuberculata* sp. nov.; venation.  
7. *Tipula (Oreomyza) resupina* sp. nov.; venation.  
8. *Tipula (Oreomyza) excetra* sp. nov.; venation.  
9. *Tipula (Lunatipula) multisetosa* sp. nov.; venation.  
10. *Tipula (Schummelia) strictiva* sp. nov.; venation.  
11. *Tipula sindensis* sp. nov.; venation.  
12. *Dolichopeza (Sinoropeza) pluricoma* sp. nov.; venation.  
13. *Cylindrotoma aurantia* sp. nov.; venation.  
14. *Limonia (Libnotes) immetata* sp. nov.; venation.  
15. *Limonia (Limonia) tuta* sp. nov.; venation.  
16. *Limonia (Rhipidia) synspilota* sp. nov.; venation.  
17. *Dicranoptycha vulpes* sp. nov.; venation.  
18. *Nipponomyia szechwanensis* sp. nov.; venation.  
19. *Ula comes* sp. nov.; venation.  
20. *Epiphragma (Epiphragma) bicinctifera* sp. nov.; venation.  
21. *Grahamomyia bicellula* gen. et sp. nov.; venation.  
22. *Crypteria spectralis* sp. nov.; venation.  
23. *Rhabdomastix (Sacandaga) holomelania* sp. nov.; venation.  
24. *Molophilus nigropolitus* sp. nov.; venation.

### PLATE 2

- FIG. 25. *Trichocera sapporensis* sp. nov.; male hypopygium.  
26. *Trichocera szechwanensis* sp. nov.; male hypopygium.  
27. *Tipula (Vestiplex) optanda* sp. nov.; male hypopygium, details.  
28. *Tipula (Vestiplex) optanda* sp. nov.; male hypopygium, details.  
29. *Tipula (Vestiplex) immota* sp. nov.; male hypopygium, details.  
30. *Tipula (Oreomyza) coxitalis* sp. nov.; male hypopygium, details.  
31. *Tipula (Oreomyza) coxitalis* sp. nov.; male hypopygium, details.  
32. *Tipula (Oreomyza) sternotuberculata* sp. nov.; male hypopygium, details.  
33. *Tipula (Oreomyza) sternotuberculata* sp. nov.; male hypopygium, details.  
34. *Tipula (Oreomyza) resupina* sp. nov.; male hypopygium, details.

## PLATE 3

- FIG. 35. *Tipula* (*Lunatipula*) *multisetosa* sp. nov.; male hypopygium, details.
36. *Tipula* (*Lunatipula*) *multisetosa* sp. nov.; male hypopygium, details.
37. *Tipula sindensis* sp. nov.; male hypopygium, dististyles.
38. *Limonia* (*Libnotes*) *immetata* sp. nov.; male hypopygium.
39. *Limonia* (*Rhipidia*) *synspilota* sp. nov.; male hypopygium.
40. *Nipponomyia szechwanensis* sp. nov.; male hypopygium.
41. *Epiphragma* (*Epiphragma*) *bicinctifera* sp. nov.; male hypopygium.
42. *Grahamomyia bicellula* gen. et sp. nov.; male hypopygium.
43. *Crypteria spectralis* sp. nov.; male hypopygium.
44. *Molophilus nigropolitus* sp. nov.; male hypopygium.
45. *Molophilus albibasis* Alexander; male hypopygium.

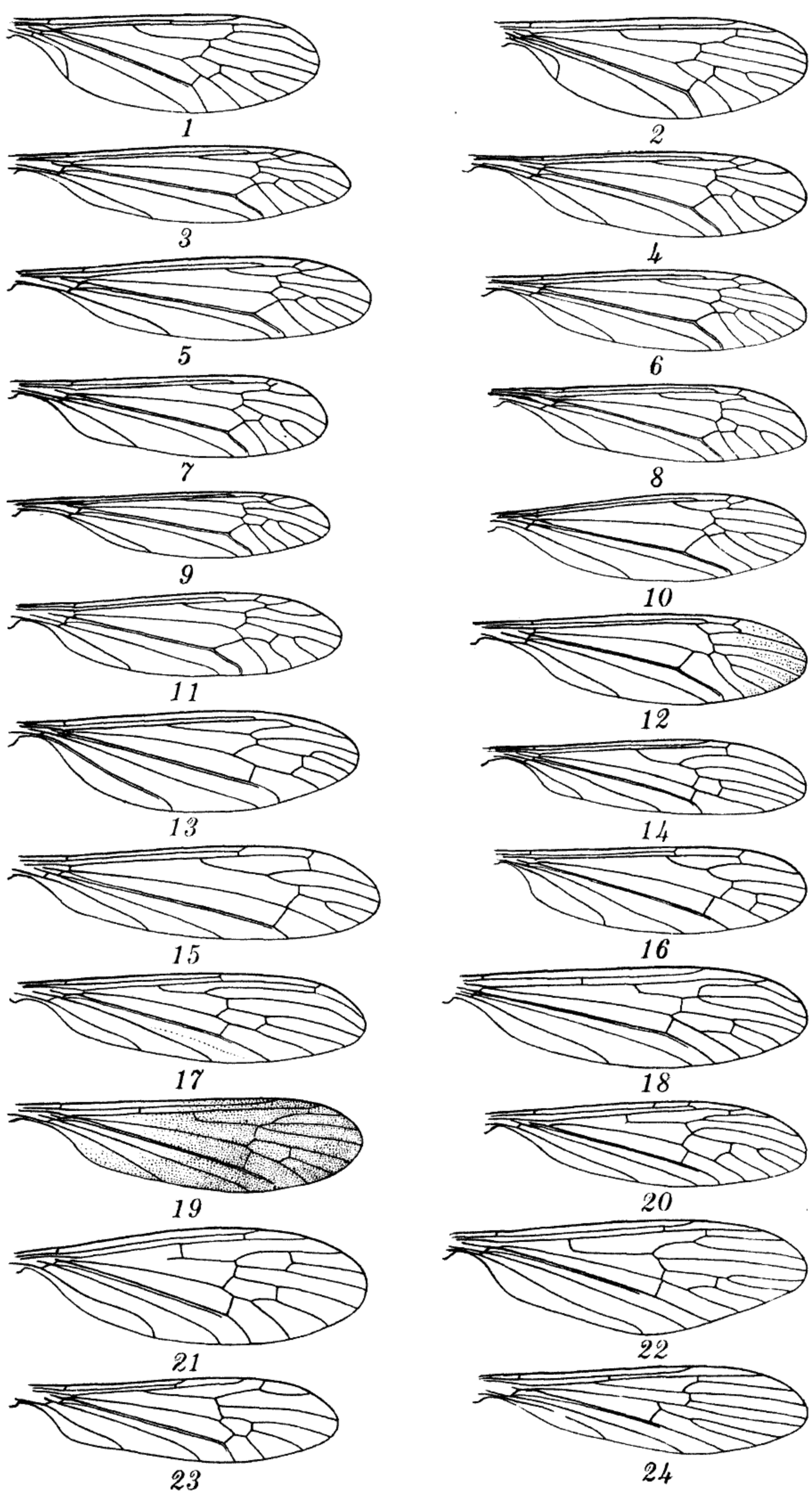


PLATE 1.



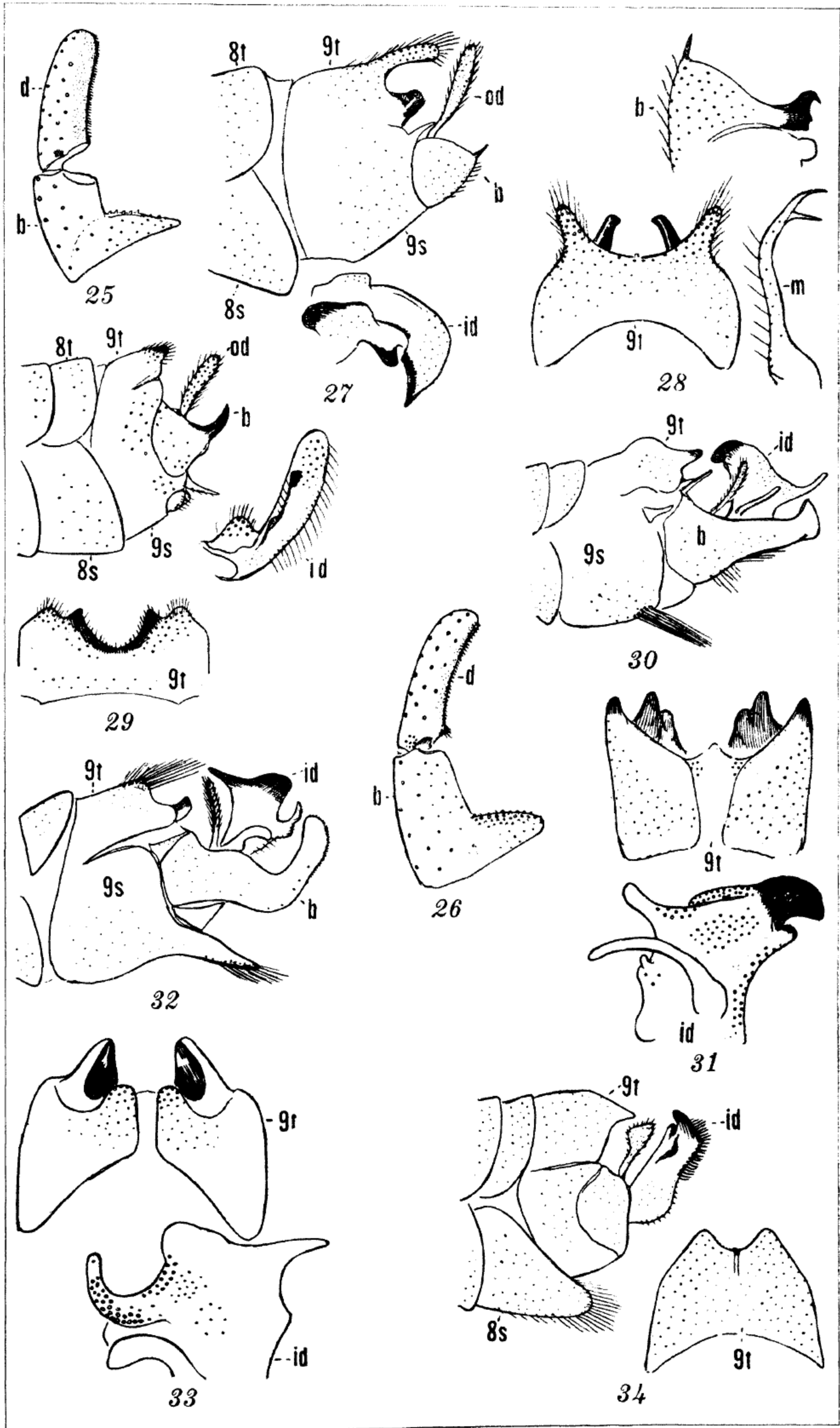


PLATE 2.





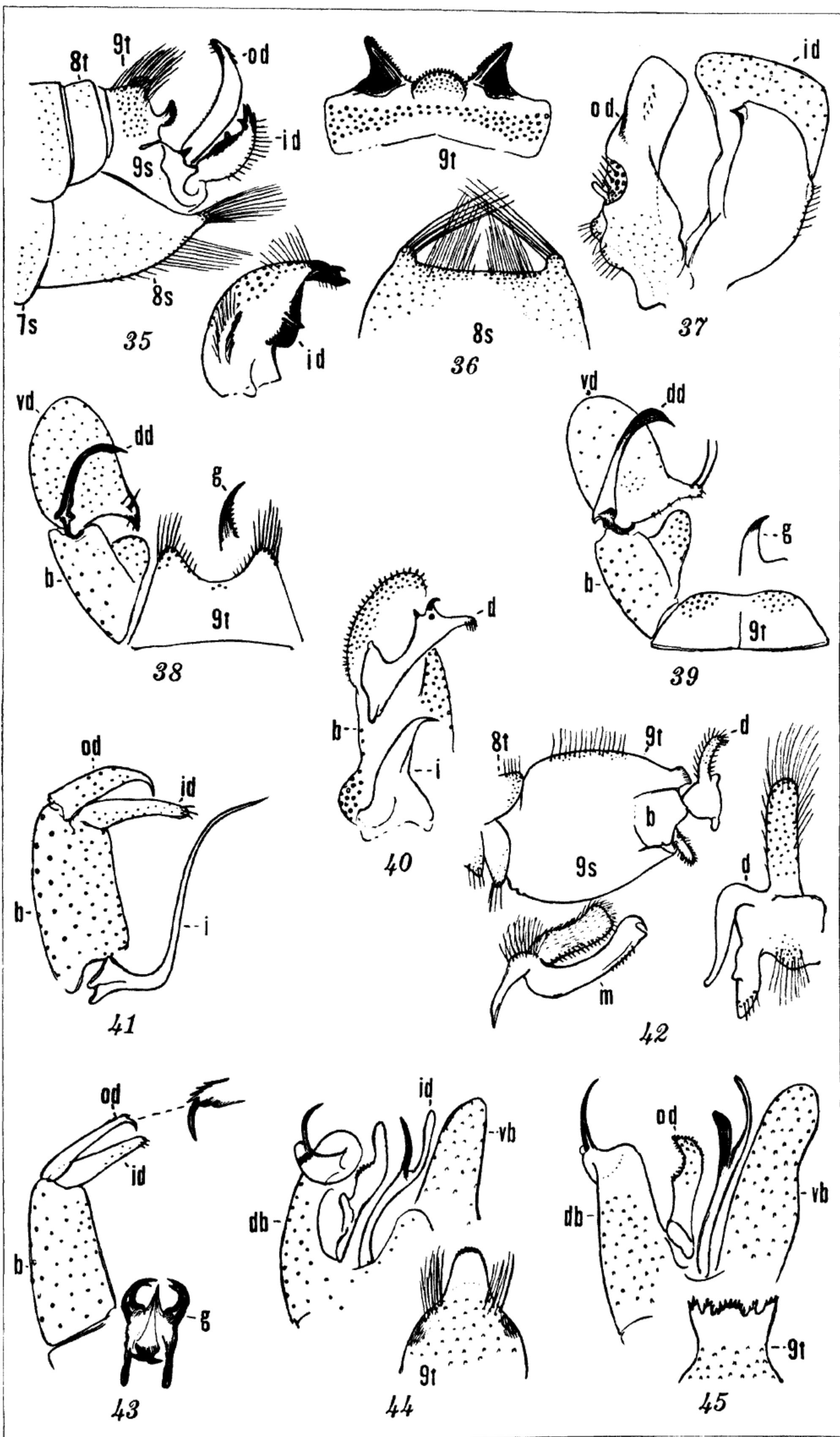


PLATE 3.

