

NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN
ASIA (DIPTERA), XXV ¹

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FOUR PLATES

In the present report I have considered a series of tipuline crane flies, all from Szechwan, western China, with the exception of two species, of which specimens were sent to me some years ago from Chekiang, by Mr. E. Suenson. The rich material discussed herewith is, in large part, collections made by the Rev. Mr. David C. Graham, and the resulting types are preserved in the United States National Museum. Still other species were taken on Mount Omei by the Rev. Mr. George M. Franck, and this material is preserved in my own collection. A few additional species were secured by Herr Friedrich, the types of which are preserved in the Deutsches Entomologisches Museum, Berlin-Dahlem, from whence they were loaned to me for study through the kind interest of Dr. Walther Horn. I record here my deepest thanks to each of the above-mentioned entomologists for this continued kindly coöperation.

At the same time I have discussed in some detail the species of *Tipula* in eastern Asia and have attempted to assign each of the numerous described forms to its proper subgenus.

TIPULINÆ

Genus TIPULA Linnæus

Tipula LINNÆUS, Systema Naturæ ed. 10 (1758) 585.

Nearly one-half of all the species of *Tipula* that have been described to date occur within the faunal limits considered in the present report. This vast series of more than 400 species has become increasingly difficult to handle, following the accession in recent years of numerous additions to an already cumbersome list. It, therefore, seems appropriate at this time to record the species known from this area and to make an attempt

¹ Contribution from the entomological laboratory, Massachusetts State College.

to place them in subgeneric groups, a first noteworthy effort toward which was made by Edwards in 1931.²

The key that is provided is tentative only and of necessity has been based in part on male and female sexual characters. In defining the subgeneric groups and recording the range of characters in each, particular stress has been devoted to the subgenotype of the various groups, virtually all of which have been available for study. The species have been distributed into what seem to be their proper subgenera, but authentic specimens of a considerable number of species have not been available to me and the assignment of such forms is entirely provisional. There remain further various species that are so aberrant in their characters that it seems inadvisable at this time to attempt to place them definitely in subgeneric groups, and these forms are recorded in a separate list.

A vast amount of work remains to be done upon this genus in eastern Asia, and the present attempt must be held as being merely preliminary. Despite the high percentage of species in this faunal area as compared with the remainder of the World, it seems probable that this will not be materially lowered following the continued discovery of new forms. The Himalayan region, Tibet and western China, together with the mountains of Indo-China and the Malayan islands, all appear to support a rich fauna in this group, only poorly known at the present time. It seems improbable to me that the discovery of novelties in this genus in Europe, Africa, North America, and South America will much more than keep pace with their continued development in eastern Asia. It should be further emphasized that New Zealand and the Polynesian islands have no species of *Tipula* and that to this date only two species (*Indotipula*) have been taken in Australia, which are included in this report in order to complete the data.

The species are recorded in this paper under three geographic units, defined as follows:

1. *Palæarctic Eastern Asia*.—Eastern Siberia; Manchukuo; Korea; Japan; Formosa; eastern China, south to 30° north latitude.

2. *Palæarctic Central Asia*.—Central and Arctic Siberia; Mongolia; Sinkiang; western China, including Kansu, Szechwan,

² Ann. & Mag. Nat. Hist. X 8 (1931) 73-82.

Kweichow, and Yunnan; Tibet; the Himalayan region, including Kashmir, eastern Punjab, Garhwal, Nepal, Sikkim, and Bhutan, as well as the Himalayan northern sections of Assam and Burma.

3. *Oriental Eastern Asia*.—Eastern China, south of 30° north latitude; India, Assam, and Burma, south of the Himalayas; Siam; French Indo-China; Malay Peninsula; East Indian Archipelago, including New Guinea and satellite islands; northern Australia.

I include Formosa in the Palæarctic Region despite its geographic position south of 30° north latitude. Most of the crane flies so far taken on the island, including all species of *Tipula*, are from high altitudes where conditions are definitely Palæarctic.

The subgenera of Tipula in central and eastern Asia.

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|-----------------------------------|-----------------------------------|
| 1. <i>Brithura</i> Edwards. | 9. <i>Acutipula</i> Alexander. |
| 2. <i>Nippotipula</i> Matsumura. | 10. <i>Indotipula</i> Edwards. |
| 3. <i>Sinotipula</i> subg. nov. | 11. <i>Papuatipula</i> Alexander. |
| 4. <i>Trichotipula</i> Alexander. | 12. <i>Tipulodina</i> Enderlein. |
| 5. <i>Schummelia</i> Edwards. | 13. <i>Arctotipula</i> Alexander. |
| 6. <i>Formotipula</i> Matsumura. | 14. <i>Vestiplex</i> Bezzi. |
| 7. <i>Tipula</i> Linnæus. | 15. <i>Oreomyza</i> Pokorný. |
| 8. <i>Yamatotipula</i> Matsumura. | 16. <i>Lunatipula</i> Edwards. |

A key to the subgenera of the genus Tipula in central and eastern Asia, based in part on sexual characters.

1. Outer cells of wing with macrotrichia..... 2.
- Cells of wing without macrotrichia..... 4.
2. Squama with setæ 5. *Schummelia*.
- Squama naked 3.
3. Rs elongate, exceeding twice the length of m-cu, the latter at near mid-length of cell 1st M_2 15. *Oreomyza*.
- Rs short, subequal to m-cu, the latter just beyond the fork of M, close to the base of cell 1st M_2 4. *Trichotipula*.
4. Vein Sc_1 present 1. *Brithura*.
- Vein Sc_1 lacking 5.
5. Rs in alignment with R_{4+5} , the basal deflection of the latter lacking; m-cu uniting with M_{3+4} some distance before fork of latter, very rarely (*phædina*) at fork; Rs unusually long, fully twice m-cu; anepisternum with setæ 2. *Nippotipula*.
- Basal section of R_{4+5} present; m-cu at fork of M_{3+4} or beyond on base of M_4 ; Rs of moderate length, ranging to one-half longer than m-cu, in some cases (as *Yamatotipula*, *Sinotipula*, *Vestiplex*, and *Oreomyza*) attaining to fully twice this length, but, if so, with the basal section of R_{4+5} preserved; anepisternum glabrous..... 6.

6. Anterior vertex produced, a slender simple lobe; pleurotergal tubercle large, with velvetlike pubescence on dorsal face; body very stout; often with setæ on dorsal sternopleurite..... 1. *Brithura*.
Anterior vertex without such a lobe, at most merely protuberant; pleurotergite not elevated into a tubercle; body relatively slender; sternopleurite glabrous (except in some species of *Arctotipula*, *Vestiplex*, and *Lunatipula*) 7.
7. Body coloration contrasted black and orange, the thorax either chiefly velvety black or else a shade of orange or reddish; ovipositor with short fleshy valves; male hypopygium with a single complex dististyle. 6. *Formotipula*.
Body coloration not contrasted black and orange as above; ovipositor with elongate sclerotized cerci (except in *Arctotipula* and some *Lunatipula* species); male hypopygium with two dististyles..... 8.
8. Legs very elongate, with snowy-white rings on femora, tibiæ, or tarsi. 12. *Tipulodina*.
Legs of moderate length, without white rings..... 9.
9. Fore tibiæ without spurs..... 10. *Indotipula*.
Fore tibiæ with a single spur..... 10.
10. Wings with m-cu unusually long, so cell M_4 is very deep and much wider at base than at margin; vein Cu_1 not conspicuously constricted at point of insertion of m-cu; male hypopygium with a compressed median blade on tergite or else with caudal margin notched. 5. *Schummelia*.
Wings with m-cu of moderate length, so cell M_4 is short and but little wider at base than at margin; Cu_1 more constricted or shirred at point of insertion of m-cu; male hypopygium with tergite not extended into a median compressed blade (where with a median lobe, as *Tipula*, *Yamatotipula*, *Acutipula*, and *Indotipula*, this depressed and set with microscopic spicules at and near apex)..... 11.
11. Ovipositor with hypovalvæ greatly reduced, the cerci correspondingly large, heavily sclerotized, placed horizontally and with the outer margins serrate; male hypopygium with the caudal portion of tergite often with a shallow, blackened, saucerlike portion, or else completely divided on midline by pale membrane; many species with an acute spine at caudal portion of basistyle; claws (male) simple. 14. *Vestiplex*.
Ovipositor with well-developed hypovalvæ; cerci either reduced and somewhat fleshy (*Arctotipula* and some *Lunatipula*) or, usually, elongate and slender, the margins quite smooth; male hypopygium without a tergal saucer and only in rare instances divided by pale membrane; basistyle not or only rarely (*Oreomyza*) produced at apex into an acute spine; claws (male) usually with a basal tooth.. 12.
12. Male hypopygium with sclerites fused into a continuous ring; region of tergite almost invariably produced into a median simple or bifid lobe that is set with microscopic spicules; claws (male) toothed.... 13.
Male hypopygium with ninth tergite and sternite separated by a suture or by pale membrane; region of tergite not produced, usually emarginate or notched; claws (male) toothed or simple..... 15.

13. Wings with m-cu usually close to fork of M; wings usually with a longitudinally striped or vittate pattern, but without a darkened cloud in cell Cu; squama naked 8. *Yamatotipula*.
Wings with m-cu at or close to midlength of cell 1st M₂; wings rarely striped longitudinally (in a few *Acutipula*), if so, with a darkened cloud at near midlength of cell Cu; some species with a costal darkening (*Tipula*); squama usually with setæ (in local fauna)..... 14.
14. Outer veins of wing with trichia; costal border of wing darkened (many *Tipula*); no dark spot at near midlength of cell Cu.. 7. *Tipula*.
Wings with outer veins glabrous or nearly so; no costal darkening; where suffused, with a dark spot at near midlength of cell Cu.
9. *Acutipula*.
15. Wing veins almost without trichia, there being none on M or its branches; squama naked; sternopleurite and meron normally with setæ; claws simple 13. *Arctotipula*.
Wing veins with evident trichia; squama naked or with a group of setæ; sternopleurite and meron glabrous; claws (male) toothed (in all local species, with the exception of a small number of *Oreomyza*).
16.
16. *Squama naked 17.
Squama with a group of setæ..... 18.
17. Rs very short, only a little longer than r-m and not exceeding two-thirds the length of m-cu; R₁₊₂ atrophied; m-cu some distance before fork of M₃₊₄, usually at near midlength..... 11. *Papuatipula*.
Rs elongate, subequal to or longer than m-cu; R₁₊₂ usually preserved, more rarely atrophied; m-cu at or close to fork of M₃₊₄.
15. *Oreomyza*.
18. Male hypopygium with the outer dististyle very large, equalling in size or exceeding the inner style; large species with marmorate wings; ovipositor with elongate valves, their margins smooth.
3. *Sinotipula*.
Male hypopygium with the outer dististyle small, cylindrical to depressed clavate; medium-sized species, usually with the wings plain or only weakly patterned; large species with marmorate wings (*marmoratipennis* group), the ovipositor with weak fleshy cerci.
16. *Lunatipula*.

Species of Tipula not definitely assigned to subgenera (in parenthesis, a mere opinion of possible location for certain species is given).

1. *blastoptera* Alexander.
2. *brunnicosta* Brunetti. (*Lunatipula* or *Acutipula*.)
3. *conjuncta* Alexander. (*Tipula* or *Oreomyza*.)
4. *filicornis* Brunetti, *lackschewitziana* Alexander, *mitocera* Alexander, and probably *pullimargo* Edwards, all appear allied. (*Acutipula*.)
5. *flavicosta* Alexander. (*Schummelia* or *Indotipula*.)
6. *flavothorax* Brunetti. (*Indotipula* or *Oreomyza*.)
7. *formosicola* Alexander. (Looks like *Yamatotipula* or *Acutipula*, but male antenna very remarkable.)

8. *gressitti* Alexander.
9. *halteroptera* Edwards.
10. *hingstoni* Edwards.
11. *ligulifera* Alexander. (*Oreomyza* or *Yamatotipula*.)
12. *nigrocostata* Alexander and *sakaguchiana* Alexander. (*Yamatotipula* or *Oreomyza*.)
13. *nigrinervis* Edwards and *tjibodensis* Alexander.
14. *pluto* Brunetti. (Not *Formotipula*.)
15. *xanthomelæna* Edwards. (Probably not *Schummelia*, authority Edwards.)

Besides the above, a few species are known to me only from insufficient descriptions and I cannot place them at this time.

Species of Tipula known only from insufficient descriptions.

1. *flavescens* Brunetti. (*Indotipula*.)
2. *japonica* Loew.
3. *inordinans* Walker.
4. *parva* Loew. (*Schummelia*.)
5. *perelegans* Alexander (*elegans* Brunetti, preoccupied). (*Vestiplex* or *Oreomyza*.)
6. *schummeli* Brunetti (*longicornis* Doleschall, preoccupied).
7. *tropica* de Meijere.

Tipula (*Tipulina*) *breviceps* Motschulsky (Amur) evidently belongs in the subfamily Limoniinæ, but is unrecognizable.

The following species from this faunal area, described in the genus *Tipula*, pertain to the allied genus *Ctenacroscelis* Enderlein.

Species described in Tipula that belong in Ctenacroscelis.

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| <i>borneensis</i> Brunetti (<i>pallida</i> Walker, preoccupied). | <i>majestica</i> Brunetti. |
| <i>brobdignagia</i> Westwood. | <i>mikado</i> Westwood. |
| <i>carmichaeli</i> Brunetti. | <i>monochroa</i> Wiedemann. |
| <i>cinerea</i> Brunetti. (very possibly). | <i>novæ-guinæ</i> de Meijere. |
| <i>congruens</i> Walker. | <i>ochripes</i> Brunetti. |
| <i>dives</i> Brunetti. | <i>ornatithorax</i> Brunetti. |
| <i>flava</i> Brunetti. | <i>pilosula</i> van der Wulp. |
| <i>flavoides</i> Brunetti. | <i>præpotens</i> Wiedemann. |
| <i>fulvolateralis</i> Brunetti. | <i>punctifrons</i> Rondani. |
| <i>fumipennis</i> Brunetti. | <i>serricornis</i> Brunetti. |
| <i>infindens</i> Walker. | <i>umbrina</i> Wiedemann. |

1. Subgenus BRITHURA Edwards

- Brithura* EDWARDS, Ann. & Mag. Nat. Hist. VIII 18 (1916) 262-263.
Tipula (*Brithura*) EDWARDS, Ann. & Mag. Nat. Hist. X 8 (1931) 76.
Tipula (*Brithura*) EDWARDS, Stylops 1 (1932) 240.

Type.—*Tipula imperfecta* Brunetti (as *Brithura conifrons* Edwards). (Eastern Palæarctic.)

Body stature stout, powerfully constructed, especially the abdomen.

Antennæ 13-segmented, relatively short in both sexes; flagellar segments with verticils of unusual length, these being three to five in number, all basal, two dorsal in position; terminal flagellar segment pointed at tip, about one-third the length of the penultimate. Frontal prolongation of head moderate in length; nasus distinct, simple. Anterior vertex produced into a simple, unusually slender tubercle. Ventral genæ with long coarse setæ.

No setæ on anepisternum; dorsal sternopleurite with many (*argyrospila* and *nymphica*), few (*sancta*), or no delicate setæ (some, *sancta*, *fracticosta*, *fractistigma*, and *imperfecta*). Coxæ with abundant long coarse setæ. Pleurotergal tubercle large and conspicuous, with dense plushlike pubescence on dorsal surface. Legs relatively stout; basitarsi shorter than tibiæ; tibial spur formula 1-1-2; claws (male) with small subbasal tooth. Wings with the costal region opposite the stigma often incrassated (especially in males), more or less arched, reaching its greatest development in males of *fracticosta* and *fractistigma* where the region is enlarged and broken by a double fracture that incloses a sharp tooth (Plate 1, fig. 2); posterior border of wing, opposite termination of vein Cu_1 , shallowly emarginate. Squama with numerous setæ; veins beyond cord almost without trichia, there being a complete series only on R_{4+5} ; more rarely with scattered trichia or incomplete series on M_{1+2} . Venation: Sc_1 present in males, weak or entirely lacking in most females, even in species (as *fractistigma*) where it is most powerfully developed in male; Rs strongly arcuated, subequal in length to $m-cu$; $r-m$ variable in length, in cases short to completely obliterated by fusion of veins R_{4+5} and M_{1+2} ; cell 1st M_2 pentagonal to high subrectangular; $m-cu$ long, at fork of M_{3+4} or shortly before this fork (Plate 1, figs. 1, 2).

Male hypopygium (Plate 2, figs. 25, 26) large, the tergite entirely separated from the sternite; basistyle small and very narrow, almost completely fused with sternite. Ninth tergite with caudal margin notched. Ninth sternite strongly produced ventrad into a median carina or tubercle. Dististyle complex, the outer arm terminating in an acute spine that is directed caudad or dorsad, longest and most conspicuous in *nymphica* (among the species where the male sex is known). Ovipositor

with cerci long and straight, smooth-margined; hypovalvæ extending to shortly beyond midlength of cerci.

Figures of venation and male hypopygia of the various species include the following:

crassa EDWARDS, Ann. & Mag. Nat. Hist. VIII 18 (1916) pl. 12, fig. 12.

fractistigma ALEXANDER, Ann. & Mag. Nat. Hist. IX 15 (1925) 387.

imperfecta BRUNETTI (as *conifrons* Edwards), Ann. & Mag. Nat. Hist. VIII 18 (1916) pl. 12, figs. 10, 11; ALEXANDER, Philip. Journ. Sci. 40 (1929) pl. 1, fig. 2.

nymphica ALEXANDER, Proc. U. S. Nat. Mus. 72 art. 2 (1927) fig. 1.

sancta ALEXANDER, Philip. Journ. Sci. 40 (1929) pl. 1, fig. 1.

The known species are all from eastern Asia, ranging from Formosa and eastern China to western China and the Himalayan region. Present information seems to indicate that the adult flies appear in late summer and autumn.

Species of the subgenus Brithura.

1. PALÆARCTIC EASTERN ASIA

imperfecta Brunetti (*conifrons* Edwards.) *sancta* Alexander.

2. PALÆARCTIC CENTRAL ASIA

argyrospila sp. nov. *imperfecta* Brunetti (see 1).
crassa Edwards (*gravelyi* Brunetti). *nymphica* Alexander.
fractistigma Alexander. *sancta* Alexander (see 1).

TIPULA (BRITHURA) ARGYROSPILA sp. nov. Plate 1, fig. 1.

Allied to *nymphica*; size very large (female, length over 40 millimeters); antennal flagellum light yellow; flagellar segments each with five verticils; tip of vertical tubercle polished yellow; pleurotergal tubercle with dorsal surface silvery; femora yellow, the tips conspicuously black; wings pale yellow, variegated by light and darker brown; prearcular region conspicuously pale yellow; vein Sc₁ atrophied; abdominal tergites deep orange, the outer lateral angles of the segments not brightened; sternites darker brown; ovipositor with shield deep red.

Female.—Length, about 43 to 45 millimeters; wing, 30 to 31.

Frontal prolongation of head dark reddish brown. Antennæ with scape dark brown; pedicel reddish brown; flagellum light yellow; flagellar segments each with five verticils. Head dark brown, the front and orbits narrowly paler; extreme point of vertical tubercle polished yellow.

Mesonotal præscutum and scutum rich cinnamon-brown, the mediotergite darker. Pleura chiefly dark brown, variegated by the conspicuous silvery dorsal surface of the pleurotergal tubercle; dorsopleural membrane broadly yellow. Legs with the femora yellow, the tips conspicuously black; tibiæ yellow, the tips rather narrowly infuscated; tarsi yellowish brown. Wings (Plate 1, fig. 1) pale yellow, variegated by light and darker brown; prearcular region conspicuously pale yellow; cells C and Sc more brownish yellow; stigma orange-yellow, surrounded by a yellow suffusion extending back to cell 1st M_2 ; wing tip and anal cell almost uniformly darkened, only sparsely variegated by yellow spots; outer medial field very pale, the color involving vein M_3 ; dark spots at origin of Rs, in cell Cu and at arculus small but conspicuous. Venation: Sc_1 atrophied; R_2 punctiform; cell 1st M_2 pentagonal, the outer end somewhat pointed; m-cu at fork of M_{3+4} .

Abdominal tergites deep orange, the posterior borders of outer segments narrowly pale; sternites darkened brown. Ovipositor with the valves and shield deep red; hypovalvæ dark.

Habitat.—China (Szechwan).

Holotype, female, Fu-Lin, altitude 3,800 to 8,200 feet, 1928 (*Graham*). Paratopotype, female.

This fly is similar to the much smaller *Tipula (Brithura) nymphica* (Alexander), which must be considered as being its nearest ally. The characters available for separating the various Chinese species of *Brithura* are indicated in the accompanying key.

Key to the Chinese species of Brithura.

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|--|-----------------------------|
| 1. Vein Sc_1 lacking (in most females)..... | 2. |
| Vein Sc_1 present (chiefly in males)..... | 4. |
| 2. Femora darkened, with a yellow subterminal ring..... | <i>sancta</i> Alexander. |
| Femora yellow, the tips conspicuously blackened..... | 3. |
| 3. Vertical tubercle uniformly darkened; size medium (wing, female, less than 25 millimeters); outer lateral angles of basal abdominal tergites pale | <i>nymphica</i> Alexander. |
| Tip of vertical tubercle polished, light yellow; size very large (wing, female, about 30 millimeters); tergites uniformly orange, the outer lateral angles not pale..... | <i>argyrospila</i> sp. nov. |
| 4. Femora unmarked or only with a faintly darker subterminal ring. | |
| | <i>imperfecta</i> Brunetti. |
| Femora with the tips broadly and conspicuously blackened..... | 5. |
| 5. Wings (male) with costal border opposite stigma broken and toothed (Plate 1, fig. 2)..... | 6. |
| Wings with costal border unbroken in either sex (Plate 1, fig. 1)..... | 7. |

6. Pleura dark brown, unvariegated except by the pale dorsal surface of the pleurotergal tubercle; antennal flagellum brownish yellow; male hypopygium with the spine of dististyle large and conspicuous.

fracticosta sp. nov.

Pleura reddish brown, variegated with silvery, additional to the pale pleurotergal tubercle; antennal flagellum uniformly dark brown; male hypopygium with outer spine of dististyle small and weak.

fractistigma Alexander.

7. Abdominal tergites reddish brown; femora yellow, the tips black.

nymphica Alexander.

Abdominal tergites brownish black; femora brown, the tips black, preceded by a yellow subterminal ring..... *sancta* Alexander.

TIPULA (BRITHURA) IMPERFECTA Brunetti.

Tipula imperfecta BRUNETTI, Rec. Indian Mus. 9 (1913) 260-261.

Brithura conifrons EDWARDS, Ann. & Mag. Nat. Hist. VIII 18 (1916) 262-263.

The types of the above names were from the eastern Himalayas and Formosa, respectively. The species had not been recorded previously from any intermediate station.

Kwanhsien, Szechwan, altitude 3,000 feet, August 16, 1930 (*Franck*). Mount Omei, Szechwan, altitude 5,500 to 10,800 feet, August 16 to 20, 1934 (*Graham*).

TIPULA (BRITHURA) FRACTICOSTA sp. nov. Plate 1, fig. 2; Plate 2, fig. 25.

Allied to *fractistigma*; antennal flagellum brownish yellow to pale brown; thoracic pleura dark brown, scarcely variegated except for the silvery dorsal surface of the pleurotergal tubercle; legs dark, the femora with a yellow subterminal ring; wings (male) with the costa broken opposite the stigma; male hypopygium with a dense brush of setæ on basistyle; spine of dististyle long and conspicuous.

Male.—Length, about 28 to 30 millimeters; wing, 22 to 24.

Frontal prolongation of head dark brown; nasus stout but distinct; palpi brownish black. Antennæ with scape and pedicel light brown, the flagellum more brownish yellow to pale brown. Head dark brown, the sides of the vertical tubercle and posterior orbits paler.

Pronotum and mesonotum dark brown, the pronotal scutellum obscure yellow. Pleura almost uniformly dark brown; dorso-pleural membrane obscure yellow. Pleurotergal tubercle with dense silvery pubescence on dorsal surface. Halteres dark brown, the apices of the knobs pale. Legs with the coxæ and trochanters dark brown to almost black; femora narrowly obscure yellow at base, thence strongly blackened, the tip black, preceded by a subequal yellow ring; tibia brown, the base nar-

rowly pale, the tip narrowly and weakly darkened; tarsi brownish black. Wings (Plate 1, fig. 2) strongly yellow, the prearcular and anterior portions clearer yellow; stigma and surrounding portions strongly saturated; a sparse dark and paler brown pattern; outer halves of cells R_2 and R_3 darkened; bases of all outer medial cells restrictedly infuscated; a broad seam on m-cu and adjoining portions of vein Cu_1 ; bases of cells R and M darkened; weak longitudinal clouds in cells R and M; veins yellow. Costal border of wing thickened, strongly bulging opposite stigma and here distinctly broken and interrupted by a sharp spur. Venation: Sc_1 strong, much longer than Sc_2 ; r-m obliterated by fusion of veins R_{4+5} and M_{1+2} , the distal section of the latter vein strongly sinuous; cell 1st M_2 unusually high, subrectangular in outline, the longest elements being the basal section of M_{1+2} and m; vein M_4 strongly arcuated.

Abdomen dark brown, the outer lateral angles of the segments restrictedly pale; hypopygium dark. Male hypopygium (Plate 2, fig. 25) with the caudal border of tergite, 9t, deeply emarginate medially, the base of the notch with setæ, the lateral lobes with more abundant and conspicuous copper-colored setæ. Basistyle much reduced, with a dense brush of burnished setæ. Dististyle, *d*, as figured; outer spine large, the apical blade narrow. Tubercle of the ventrally produced ninth sternite, 9s, moderately developed.

Habitat.—China (Szechwan).

Holotype, male, Lin-Ngai-Si, near Kwanhsien, altitude 3,500 feet, September 20, 1930 (*Graham*). Paratype, male, Ginfü-Shan, District Nanchüan, August, 1929–1931 (*Friedrich*).

I am referring the Nanchüan specimen here with some doubt, as the pleura is different in color from that of the type, the dorsal sternopleurite, ventral pteropleurite, and most of the meron being pruinose with gray, contrasting with the remainder of pleura. The relationship with *fractistigma* (dististyle, Plate 2, fig. 26, *d*) is shown by the key provided at this time.

2. Subgenus NIPPOTIPULA Matsumura

Nippotipula MATSUMURA, Thousand Ins. Japan, Add. 2 (1916) 457–458.

Tipula (*Nippotipula*) EDWARDS, Ann. & Mag. Nat. Hist. X 8 (1931) 77.

Tipula (*Nippotipula*) EDWARDS, Stylops 1 (1932) 238.

Type.—*Tipula coquilletti* Enderlein (as *Nippotipula nubifera* Coquillett by Matsumura). (Eastern Palæarctic.)

Antennæ 13-segmented, relatively short in both sexes; verticils exceeding the segments in length; terminal flagellar segment more than one-half as long as the penultimate. Vertical tubercle low and poorly developed.

Scutal lobes each with two darkened areas that are ringed with pale color. Setæ on propleura and sides of pronotal scutellum, as well as on the sternopleurite and more sparsely on anepisternum. Mesonotal interspaces with relatively abundant setæ that are long and conspicuous, especially on the scutellum and mediotergite. Pleurotergal tubercle moderately developed. Tibial spur formula 1-2-2; claws (male) toothed. Wings with Rs very long, fully twice m-cu, the latter close to midlength of cell 1st M_2 and almost always uniting with M_{3+4} some distance before its fork; in rarer cases, m-cu close to fork of M_{3+4} (*phædina*); Rs in direct alignment with R_{4+5} , the basal deflection of the latter lacking. Squama with a group of setæ; M and branches naked or with sparse trichia.

Abdomen long to very long especially in *coquilletti* and *sinica*. Male hypopygium with suture between ninth tergite and sternite complete; basistyle cut off from sternite only by ventral suture. Outer dististyle very large and depressed; inner style unusually small. Eighth sternite produced caudad into a profoundly bifid median lobe. Ovipositor with smooth cerci; hypoalvæ well developed.

Species of the subgenus Nippotipula.

1. PALÆARCTIC EASTERN ASIA

coquilletti Enderlein (*nubifera* *sinica* sp. nov.
Coquillett, preoccupied).

2. PALÆARCTIC CENTRAL ASIA

phædina Alexander. *sinica* sp. nov. (see 1).
pulcherrima Brunetti. *susurrans* Edwards.

3. ORIENTAL EASTERN ASIA

anastomosa Edwards. *xanthostigma* Edwards.

TIPULA (NIPPOTIPULA) SINICA sp. nov. Plate 1, fig. 3; Plate 2, fig. 27.

Very closely allied to *coquilletti*, differing in the usually smaller size, more-slender build, less extensively darkened median præscutal stripe, and the chiefly black legs, especially the fore pair.

Male.—Length, 30 to 33 millimeters; wing, 21 to 23; abdomen alone, 22 to 23.

Female.—Length, 35 to 36 millimeters; wing, 22 to 23; abdomen alone, 28 to 29.

Frontal prolongation of head brown, light gray pruinose above; nasus distinct; palpi brownish black, the terminal segment beyond base somewhat paler. Antennæ with basal segment brown; pedicel yellow; basal flagellar segment brownish yellow, the succeeding segments dark brown with their basal enlargements a trifle darker; longest verticils exceeding the segments. Head light gray, the genæ darker.

Pronotum whitish gray, slightly darker medially. Mesonotal præscutum whitish gray, with three stripes, the median stripe chiefly dark gray, the outer borders conspicuously velvety black on cephalic half or less; lateral stripes chiefly velvety black, paling to gray behind; humeral region immediately before the lateral stripes more or less darkened; each scutal lobe with two velvety black spots that are narrowly bordered by light gray, the median region of the scutum slightly darker gray; scutellum brownish gray, the sunken parascutella darker; mediotergite gray, variegated laterally and behind with darker, the latter pattern consisting of two circular areas; in cases a more or less distinct median dark line on scutellum and mediotergite. Pleura silvery gray with a broad brown dorsal stripe extending from the cervical region to the pleurotergite, where it becomes a little paler; extreme ventral sternopleurite and dorsal meron darkened. Halteres dark brown, the base of stem narrowly pale. Legs with the fore coxæ brownish gray, narrowly dark brown at base middle coxæ gray, narrowly darkened at posterior border; posterior coxæ chiefly dark brown, the outer end gray; trochanters chiefly dark brown; legs chiefly black, especially the fore pair; femoral bases restrictedly pale, broadest and most conspicuous on posterior legs. Wings (Plate 1, fig. 3) with the pattern almost as in *coquilletti*, differing only in slight details; ground color whitish, with darker washes and two major clouds, the latter at origin of Rs and in the stigmal region; outer radial field less strongly suffused, especially in outer end of cell R_3 ; a series of dark marginal spots at ends of all outer longitudinal veins; veins brown, paler in costal field. Venation: Rs shorter than in *coquilletti*.

Abdomen chiefly yellow; first tergite dark with a median yellow line; succeeding tergites with the margins pale, the subcaudal borders very narrowly blackened; a black median tergal

stripe begins on the third segment, becoming broader and more diffuse behind; lateral borders of tergites narrowly grayish; hypopygium more uniformly darkened. Male hypopygium (Plate 2, fig. 27) with the tergite, 9t, separated from the sternite, 9s, by a suture; basistyle chiefly fused with sternite, represented by a weak ventral suture, the posterior end of style produced into a short broad truncated lobe. Ninth tergite, 9t, greatly arched, the caudal margin with two blackened lobes that are set with black spinulæ. Eighth sternite, 8s, produced into a broadly flattened, shovellike lobe that is profoundly split, each lateral lobe relatively broad.

Habitat.—China.

Holotype, male, Hills near Ning-po, halfway to Nimrod Sound, Che kiang, May 1, 1925 (*Suenson*). Allotopotype, female. Paratopotype, male. Paratypes, males and females, Kwanhsien, Szechwan, 2,000 to 4,000 feet, May 8 to 28, 1930 (*Graham*); females, Chengtu, Szechwan, altitude 1,700 feet, April 1 to 10, 1933 (*Graham*).

While the present fly is closely allied to *Tipula* (*Nippotipula*) *coquilletti* Enderlein, there seems to be little question of its distinctness.

3. Subgenus SINOTIPULA novum.

Type.—*Tipula exquisita* sp. nov. (Eastern Palæarctic.)

Antennæ 13-segmented; verticils very long and conspicuous, fully one-half longer than the segments; terminal segment about one-half as long as the penultimate. Frontal prolongation of head long; nasus distinct. Vertical tubercle low and merely protuberant.

No setæ on mesopleura. Coxæ with abundant long setæ. Pleurotergal tubercle not or scarcely evident. Legs relatively long and slender; basitarsi a little shorter than the tibiæ; tibial spur formula 1-1-2; claws (male) with subbasal tooth. Squama and veins with trichia. Wings with outer section of vein R_1 unusually long, much longer than the free tip of Sc_2 ; R_{1+2} entire; vein R_3 more or less sinuous, somewhat constricting cell R_3 at near midlength; basal section of R_{4+5} long and distinct; R_s long to very long, from one and one-half to more than two times as long as m-cu; m-cu at or very close to fork of M_{3+4} , unusually long, so cell M_4 is markedly wider at base.

Male hypopygium (Plate 2, fig. 28-31) with tergite and sternite separated by a suture. Tergite large and tumid, often

with two rounded lobes on caudal portion; in some species (including the subgenotype) with complex sclerotized armature on ventral surface. Outer dististyle very large, equaling or exceeding in area and complexity the relatively small inner style. Ovipositor with cerci long and relatively slender, the margins smooth.

Points of contact.—The subgenera most apt to be confused are *Brithura*, *Nippotipula*, and *Lunatipula*, all of which have similar groups of setæ on the squamæ and include members of large size and of showy coloration. *Brithura* is readily told by the slender conical vertical tubercle; *Nippotipula* by the lack of the basal section of R_{4+5} and the position of m-cu far before the fork of M_{3+4} . Some of the groups that I have referred to *Lunatipula*, especially the *marmoratipennis* group, bear a general resemblance to the present aggregation of species yet are quite distinct in the structure of the ovipositor and other characters.

Species of the subgenus Sinotipula.

2. PALÆARCTIC CENTRAL ASIA

<i>bodpa</i> Edwards.	<i>hobsoni</i> Edwards.
<i>brunettiana</i> Alexander (<i>splendens</i> Brunetti, preoccupied).	<i>persplendens</i> sp. nov.
<i>cranbrookii</i> Edwards.	<i>sindensis</i> Alexander.
<i>exquisita</i> sp. nov.	<i>tessellatipennis</i> Brunetti.
<i>gloriosa</i> sp. nov.	<i>thibetana</i> de Meijere.
<i>gregoryi</i> Edwards.	<i>trilobata</i> Edwards.
<i>griseipennis</i> Brunetti.	<i>waltoni</i> Edwards.
	<i>wardi</i> Edwards.

I had earlier called all of these the *thibetana* group, but it now seems that *exquisita*, *gregoryi*, *hobsoni*, and *waltoni* may well be separated as a distinct group, the *gregoryi* group, based chiefly on conspicuous modifications of the ninth sternite of the male hypopygium.

TIPULA (SINOTIPULA) EXQUISITA sp. nov. Plate 1, fig. 4; Plate 2, fig. 28.

Belongs to the *gregoryi* group, allied to *gregoryi*; head above light gray; wings pale brown, variegated by darker brown and cream-colored areas; prearcular region chiefly pale, the arcular transverse band ill-defined; male hypopygium with two pairs of lobes on ninth sternite, projecting caudad, the more dorsal pair clothed with long yellow setæ.

Male.—Length, 19 to 22 millimeters; wing, 22 to 25.

Female.—Length, 22 to 24 millimeters; wing, 24 to 26.

Frontal prolongation of head reddish brown, a little darker on sides; nasus elongate; palpi dark brown, terminal segment black. Antennæ with scape and pedicel yellow; flagellum brownish black; longest verticils a little exceeding the segments. Head above light gray, with vague indications of a darker median vitta; genæ darker; a darkened spot above each antennal fossa, as in *gregoryi*.

Pronotum dark medially, broadly yellow on sides. Mesonotal præscutum brownish yellow with four slightly indicated brighter brown stripes, the intermediate pair scarcely separated by a median vitta; humeral and lateral margins a little darkened; scutal lobes brown; scutellum brownish gray; mediotergite clearer gray. Pleura dark brown, variegated with silvery on dorsal sternopleurite and meron; dorsopleural region light yellow. Halteres with stem obscure yellow, brighter at base; knobs darkened basally, the tips paler. Legs with the coxæ dark gray; trochanters yellowish brown; femora obscure yellow, the tips black; tibiæ and basitarsi yellow, the tips narrowly darkened; remainder of tarsi black. Wings (Plate 1, fig. 4) with a pale brown tinge, variegated by darker brown and sparse cream-colored areas, the ground color much paler than in *gregoryi*, but the pattern arranged much the same; arcular pale band incomplete, best indicated in cell 2d A, in the arcular region more diffuse due to a general paling of the prearcular field. Wings shorter and broader than in *gregoryi*; cell 1st M₂ proportionately smaller.

Abdomen (male) with basal six segments reddish yellow, without distinct markings; outer abdominal segments black. In female the tergites striped laterally with dark brown. Male hypopygium (Plate 2, fig. 28) with the tergite, 9t, having the caudal border weakly emarginate, clothed with abundant coarse setæ; on ventral surface of tergite (as figured) a transversely quadrate sclerotized plate that is conspicuously armed with large spines at each angle of the plate; dorsal border of this tergal plate with three smaller, slenderer spines. Dististyle, *d*, complex, as figured. From the mesal-caudal portion of the sternite, 9s, protrude two pairs of conspicuous appendages; the more dorsal pair are fleshy lobes that are densely tufted with yellow setæ; the more-ventral appendages appear as compressed blades, their margins with parallel striæ. Ovipositor with short, stout cerci.

Habitat.—China (Szechwan-Tibet border).

Holotype, male, Yin-Kuan-Tsai, altitude 13,000 to 15,000 feet, July 25, 1930 (*Graham*). Allotype, female, Yu-Long-Gong, altitude, 14,000 feet, August 14, 1930 (*Graham*). Paratopotypes, 4 males. Paratypes, 1 male, 1 female, Zya-Ha Pass, altitude 14,000 to 17,000 feet, July 25 to 27, 1930; 1 male, near Tang-Gu, altitude 14,000 feet, August 3 to 6, 1930; 1 male, near Yien-Long-Shien, altitude 13,000 to 15,000 feet, August 3 to 6, 1930 (*Graham*).

The nearest allies of the present fly are *Tipula* (*Sinotipula*) *gregoryi* Edwards (Yunnan, Szechwan) and *T. (S.) waltoni* Edwards (Tibet), both of which differ especially in the details of coloration of the body and wings.

TIPULA (SINOTIPULA) GLORIOSA sp. nov. Plate 1, fig. 5; Plate 2, figs. 29 and 30.

Belongs to the *thibetana* group; allied to *trilobata*; mesonotum brownish yellow, with four conspicuous brown stripes; lateral margins of præscutum further darkened; antennal flagellum black; femora brownish yellow, the tips very narrowly to scarcely darkened; wings brown, tessellated with yellow; male hypopygium with the outer dististyle larger than the inner.

Male.—Length, about 18 millimeters; wing, 20.

Frontal prolongation of head brownish gray; nasus conspicuous; palpi dark brown, in the paratype female with the intermediate segments conspicuously light yellow. Antennæ of moderate length to short, in male, if bent backward, not quite reaching the wing root; scape brownish yellow; pedicel and base of first flagellar segment yellowish brown; remainder of flagellum black, the basal enlargements of the segments a little more protuberant on outer face so the flagellar segments appear slightly irregular in their alignment. Head brownish gray, clearer gray on front and anterior vertex; a narrow black vitta from summit of anterior vertex to the occiput.

Pronotal scutellum chiefly black, obscure yellow behind. Mesonotal præscutum with the ground color brownish yellow, with four conspicuous brown stripes, the intermediate pair approximated or narrowly contiguous at extreme cephalic end; lateral portions of præscutum before suture narrowly black, behind the suture more extensively dark brown; humeral region between the lateral and intermediate stripes washed with dusky; scutum

grayish yellow, each lobe variegated by a large brown area; scutellum light gray, with a median brown vitta, more evident in female; mediotergite grayish brown. Pleura chiefly pale, with brown longitudinal areas, including a dorsal stripe; dorso-pleural region conspicuously yellow. Halteres yellow, the base of each knob dusky. Legs with the coxæ brown; trochanters yellowish brown; femora, tibiæ, and basitarsi brownish yellow, the extreme tips blackened; remainder of tarsi black. Wings (Plate 1, fig. 5) rather dark brown, conspicuously variegated with yellow, more contrasted in female than in male; prearcular region chiefly infumed; cell C brownish yellow, cell Sc clear yellow; the yellow discal areas appear as zigzag crossbands over the basal cells of wing, beyond the cord appearing as an incomplete crossband beyond stigma, not reaching cell 1st M_2 , and as pale triangular spots in outer ends of cells R_3 to M_4 , inclusive, more extensive in cell R_5 where nearly the outer end is pale; cubital and anal cells more conspicuously variegated by the zigzag areas above mentioned; a more whitish oblitative band across cord, from cell R to base of cell M_3 ; veins dark, more yellowish in the flavous areas. Venation: R_{1+2} preserved; R_3 arched, somewhat constricting cell R_3 at near midlength; m-cu very long, cell M_4 much wider at base than at apex.

Abdomen with basal tergite infuscated; succeeding tergites obscure yellow, beyond the second darkened sublaterally at base, the lateral borders broadly pale; sternites chiefly yellow; outer segments and hypopygium passing into black. Male hypopygium (Plate 2, fig. 29) large and rounded, without conspicuously projecting appendages; the tergite, 9t, with two low glabrous lobes on caudal portion, the arched dorsal portion with long conspicuous black setæ. Dististyles (Plate 2, fig. 30, *od*, *id*) as shown, the inner much smaller than the outer, with a small pale appendage near its apex, the actual tip stout.

Habitat.—China (Szechwan).

Holotype, male, Wei-Chow, 65 miles northwest of Chengtu, altitude 9,000 to 12,500 feet, August 15, 1933 (*Graham*). Allotype, broken female, O-Er, 26 miles north of Li-Fan, altitude 10,800 feet, August 16, 1933 (*Graham*). Paratopotype, broken female, with holotype.

The present fly and the one next described are closely related, being apparently most nearly allied to *Tipula* (*Sinotipula*) *trilobata* Edwards among the described forms, differing conspicu-

ously in the coloration of the thorax and abdomen, and in genitalic structures.

TIPULA (SINOTIPULA) PERSPLENDENS sp. nov. Plate 2, fig. 31.

Belongs to the *thibetana* group; allied to *gloriosa*; mesonotal præscutum obscure yellow, with four reddish brown stripes that are very narrowly bordered by darker; antennal flagellum brownish black; femora yellow, the tips very narrowly and insensibly darkened; wings pale brown, variegated and tessellated with pale yellow and darker brown areas; outer medial cells with centers washed with pale brown; basal abdominal segments reddish brown, the outer segments darkened; male hypopygium with the inner dististyle bifid at apex, the beak slender.

Male.—Length, about 25 millimeters; wing, 27.

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

Frontal prolongation of head elongate, brown, the dorsum light gray pruinose; nasus distinct; palpi brown, the elongate outer segment brownish black. Antennæ relatively short, in male, if bent backward not quite attaining the wing root; scape yellow; pedicel and first flagellar segment brownish yellow; remainder of organ brownish black. Head light gray with a continuous, dark brown, median stripe from summit of vertex to occiput.

Pronotum dark brown medially, paler on sides. Mesonotal præscutum obscure yellow, with four reddish brown stripes that are very narrowly and irregularly bordered by brown, more evident on the lateral stripes and cephalic portions of the intermediate stripes; a dusky line across the humeral region, from the intermediate stripe caudad; lateral border of sclerite before the suture strongly darkened; median region of præscutum adjoining the suture narrowly bordered by dark brown; scutal lobes reddish brown, paler medially and narrowly silvery adjoining the suture, with a dusky mark on mesal edge behind; scutellum and mediotergite gray laterally, brown medially. Pleura pale, conspicuously variegated by dark brown, including a dorsal stripe extending from the cervical region across propleura, ventral anepisternum, and ventral pteropleurite; ventral sternopleurite and meron darkened; dorsopleural region light yellow. Halteres yellow, the knobs infuscated, the apex a little paler. Legs with the coxæ gray, narrowly darkened at base; trochanters brownish yellow; femora and tibiæ yellow, the tips very narrowly and insensibly darkened; tarsi black, the proximal

end of basitarsus brightened. Wings with the ground color rather pale brown in both sexes, variegated by extensive pale yellow areas and more restricted darker brown markings; the darker brown areas include a relatively small postarcular darkening that is more extensive in cell Cu; a very small spot at origin of Rs, and the stigmal darkening; the ground areas of paler brown appear as extensive zigzag clouds across the basal half of wing, restricting the yellow to narrow lines; beyond the cord the centers of the outer medial cells are washed with very pale brown, at margin inclosing a clear yellow spot; dark area in cell R₅ much restricted; poststigmal yellow area extensive; veins pale brown, C, Sc, R, and outer half of Cu clearer yellow. Venation: m-cu very long.

Basal three abdominal tergites reddish brown, the succeeding segments somewhat darker, in male more or less pruinose, in female with caudal borders of the segments narrowly yellow; basal sternites reddish brown, the outer segments darker. Male hypopygium in general somewhat similar to that of *gloriosa*; caudal margin of tergite terminating in two low rounded lobes, the notch between small and circular; tergal lobes with setæ almost to outer ends; dorsal posterior portion of tergite with numerous setæ. Dististyles (Plate 2, fig. 31, *od*, *id*) as figured; inner style at apex split into two slender lobes, the darker-colored one being the usual beak; outer style very obtuse in its outlines, on its cephalic margin at near midlength with a flattened, sclerotized plate.

Habitat.—China (Szechwan-Tibet border).

Holotype, male, near Tang-Gu, altitude 14,000 feet, August 3 to 6, 1930 (*Graham*). Allotype, female, Yin-Kuan-Tsai, altitude 13,000 to 15,000 feet, July 25, 1930 (*Graham*).

The nearest ally of the present fly is *Tipula* (*Sinotipula*) *gloriosa* sp. nov., which is readily told by the different wing pattern and structure of the male hypopygium.

4. Subgenus TRICHOTIPULA Alexander

Tipula (*Trichotipula*) ALEXANDER, Proc. Acad. Nat. Sci. Philadelphia 67 (1915) 468.

Tipula (*Cinctotipula*) ALEXANDER, Proc. Acad. Nat. Sci. Philadelphia 67 (1915) 469.

Tipula (*Odontotipula*) ALEXANDER, Cornell Univ. Agr. Exp. Sta. Mem. 38 (1919) 943.

Type.—*Tipula oropezoides* Johnson. (Eastern Nearctic.)

Antennæ short to elongate (in male); verticils present but usually shorter than the segments. Frontal prolongation of head short to very short, much as in *Dolichopeza*; nasus long and slender.

Halteres elongate. Legs long and slender; tibial spur formula 1-2-2; claws (male) with basal tooth. Squama naked; all longitudinal veins with trichia, almost, if not quite, to wing base; abundant trichia in outer cells of wing, most numerous in *polytricha* where virtually the entire wing surface is covered. Venation: R_{1+2} entire; Rs short, subequal to m-cu; m-cu on M_{3+4} shortly beyond fork of M, the former thus being short to almost lacking; cell M_4 deep, widened at proximal end, m-cu being oblique to very oblique.

Male hypopygium of simple construction; posterior margin of ninth sternite more or less produced caudad into a fleshy lobe. Ovipositor with cerci sclerotized, compressed-flattened, the tips obtuse, considerably exceeding the hypovalvæ.

Species of the subgenus Trichotipula.

1. Palæarctic Eastern Asia. *haplotricha* Alexander.
2. Palæarctic Central Asia. *polytricha* Alexander.

5. Subgenus SCHUMMELIA Edwards

Tipula (Schummelia) EDWARDS, Ann. & Mag. Nat. Hist. X 8 (1931) 80-81.

Type.—*Tipula variicornis* Schummel. (Northern Palæarctic.)

Antennæ (male) often elongate; verticils long, subequal to or exceeding the segments except in the species with elongate antennæ; terminal segment reduced to a thimble-shaped structure. Frontal prolongation of head short to very short; nasus conspicuous.

Mesopleura glabrous. Tibial spur formula 1-2-2; claws (male) with basal tooth. Squama with abundant setæ; all veins beyond cord with numerous macrotrichia; some species (*macrotrichiata* group) with sparse macrotrichia in outer cells. Venation: R_{1+2} entire; Rs relatively short, subequal to the long m-cu; cell M_4 deep and markedly wider at base than at margin; m-cu very oblique, variable in position, often placed near base of the small or medium-sized cell 1st M_2 , in other cases at near midlength of the cell, close to the fork of M_{3+4} ; M_4 in direct

alignment with M_{3+4} ; m often reduced in length by the approximation of veins M_{1+2} and M_3 ; Cu_1 without a distinct constriction or shirring at point of insertion of m-cu.

Male hypopygium with tergite and sternite separate, or fused on extreme cephalic portion only. Median region of tergite produced into a compressed blade (*variicornis* subgroup) or notched medially (*continuata* subgroup). Outer dististyle elongate but compressed. Inner dististyle a flattened blade, on cephalic margin produced into a slender beak. Eighth sternite unarmed. Ovipositor with long, straight, very slender cerci; hypoalvæ elongate, compressed, longer than the cerci.

The three groups in the local fauna have been briefly discussed in another paper.³ The present subgenus and *Trichotipula* must be very close to the ancestral type of the genus *Dolichopeza*.

Species of the subgenus Schummelia.

1. PALÆARCTIC EASTERN ASIA

<i>acifera</i> Alexander.	<i>microcellula</i> Alexander.
<i>bidenticulata</i> Alexander.	<i>nikkoensis</i> Alexander.
<i>cylindrostylata</i> Alexander.	<i>nipponensis</i> Alexander.
<i>ecaudata</i> Alexander.	<i>querula</i> Alexander.
<i>esakiana</i> Alexander.	<i>rantaicola</i> Alexander.
<i>imanishii</i> Alexander.	<i>sparsiseta</i> Alexander.
<i>insulicola</i> Alexander.	<i>sparsissima</i> Alexander.
<i>i. fuscicauda</i> Alexander.	<i>strictiva</i> Alexander.
<i>jocosipennis</i> Alexander.	<i>variicornis</i> Schummel.
<i>macrotrichiata</i> Alexander.	<i>v. latiligula</i> Alexander.

2. PALÆARCTIC CENTRAL ASIA

<i>angustiligula</i> Alexander.	<i>indiscreta</i> Alexander.
<i>chumbiensis</i> Edwards.	<i>nigrocellula</i> Alexander.
<i>continuata</i> Brunetti.	<i>sessilis</i> Edwards (<i>demarcata</i> Brunetti, preoccupied).
<i>honorifica</i> Alexander.	<i>xanthopleura</i> Edwards.
<i>indifferens</i> Alexander.	

3. ORIENTAL EASTERN ASIA

<i>hampsoni</i> Edwards.	<i>pumila</i> de Meijere.
<i>inconspicua</i> de Meijere.	<i>rhombrica</i> Edwards.
<i>klossi</i> Edwards.	<i>salakensis</i> Alexander (<i>robinsoni</i> Edwards).
<i>pendleburyi</i> Edwards.	<i>vitalisi</i> Edwards.
<i>picticornis</i> (Brunetti).	

³ Alexander, Philip. Journ. Sci. 51 (1933) 374.

6. Subgenus FORMOTIPULA Matsumura

Formotipula MATSUMURA, Thousand Ins. Japan, Add. 2 (1916) 456-457.

Tipula (*Formotipula*) EDWARDS, Ann. & Mag. Nat. Hist. X 8 (1931) 77.

Type.—*Formotipula holoserica* Matsumura. (Eastern Palæarctic.)

Antennæ of moderate length, the verticils exceeding the segments. Frontal prolongation of head short; nasus short but distinct; palpi elongate.

No setæ on mesopleura; on notum sparse and erect. Tibial spur formula 1-1-2; claws (male) toothed. Squama naked; trichia of outer medial branches variable in number, sometimes much reduced, in the subgenotype relatively numerous. Venation: R_{1+2} preserved (*dikchuensis*, *friedrichi*, *holoserica*, *hypopygialis*, *luteicorporis*, *melanomera*, *melanopyga*, *rufizona*, *rufoabdominalis*, and *sciariformis*), normally lacking or more or less atrophied in the remaining species; Rs of moderate length, subequal to or much shorter than m-cu; fork of M_{3+4} close to mid-length of cell 1st M_2 , m-cu at or just beyond this fork; cell M_4 short and broad, m-cu being only a little shorter than the distal section of Cu_1 .

Abdomen short and compact, in male with hypopygium strongly tilted upward. Male hypopygium with the tergite separated from the sternite by a suture or, in cases (as in *friedrichi*), with the suture obsolete or virtually so, the tergite being fused with the sternite. Ninth tergite either notched medially or with a more or less distinct, beaklike, median projection (*friedrichi*, *holoserica*, and others). In cases basistyle more or less produced at apex into a fleshy lobe that is sometimes set with spinous points. Dististyle single, usually complicated in structure. Eighth sternite unarmed. Ovipositor with both cerci and hypovalvæ greatly reduced in size, fleshy.

The included species are medium-sized to relatively large flies, with highly contrasted coloration, the thorax either velvety black or reddish orange, contrasting strongly with the opposite color elsewhere on the body. Abdomen usually bicolorous, the basal portion reddish, the apex blackened. Edwards reports some variation in the presence or absence of vein R_{1+2} in *melanomera* and possibly in other species.

Species of the subgenus *Formotipula*.

1. PALÆARCTIC EASTERN ASIA

holoserica Matsumura (*nigrorubra* Riedel, *rufomedia* Edwards), *kiangsuensis* Alexander.

2. PALÆARCTIC CENTRAL ASIA

dikchuensis Edwards. *obliterata* Alexander.
exusta Alexander. *omeicola* sp. nov.
friedrichi sp. nov. *rufizona* Edwards.
hypopygialis Alexander. *rufoabdominalis* Alexander (*rufiventris* Brunetti, preoccupied).
luteicorporis Alexander.
melanomera Walker.

3. ORIENTAL EASTERN ASIA

cinereifrons de Meijere. *lipophleps* Edwards.
dusun Edwards. *melanopyga* Edwards.
laosica Edwards. *sciariformis* Brunetti.

Tipula pluto Brunetti (French Indo-China: Tonkin) cannot belong to *Formotipula*, as stated by Edwards (1932), because of the structure of the ovipositor.

TIPULA (FORMOTIPULA) OMEICOLA sp. nov. Plate 1, fig. 6.

Head and thorax velvety black, the præscutum with indications of four faintly gray stripes; wings strongly tinged with black; R_{1+2} entirely atrophied; cell 1st M_2 relatively large; abdomen black, with segments two to five, inclusive, orange-yellow.

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

Entire head black; nasus short but distinct. Antennæ and palpi black.

Thorax velvety black, the præscutum with indications of four faintly gray stripes, the intermediate pair separated by a line of the ground color that is a little wider than either stripe; posterior sclerites of notum sparsely pruinose. Pleura black. Halteres and legs black throughout. Wings (Plate 1, fig. 6) strongly tinged with blackish, the oval stigma darker brown; veins dark brown. Venation: R_{1+2} entirely atrophied; cell 1st M_2 of moderate length, much larger than in *obliterata*; second section of M_{1+2} longer than the third section (petiole of cell M_1).

Abdomen with the first segment black; segments two to five, inclusive, entirely orange-yellow; remaining segments, including ovipositor, black.

Habitat.—China (Szechwan).

Holotype, female, Mount Omei, altitude 4,500 feet, August 10, 1929 (*Franck*).

The nearest ally is undoubtedly *Tipula* (*Formotipula*) *obliterata* Alexander (Szechwan-Tibet border), which is approximately similar in color, except that the fifth abdominal segment is extensively blackened. The latter species further has cell 1st M_2 unusually small, less than the petiole of cell M_1 .

TIPULA (FORMOTIPULA) FRIEDRICHI sp. nov. Plate 1, fig. 7; Plate 2, fig. 32.

Head and thorax, with appendages, entirely velvety black; abdomen with first segment and outer five segments velvety black, the intermediate segments chiefly orange, the color somewhat variable, in cases with the orange color much reduced by encroachment of the black; wings strongly dimidiate, the cells before the cord strongly suffused with brown, the outer cells paling to gray; R_{1+2} entire; male hypopygium with the median region of the tergite produced into a lobe that terminates in an acute decurved point.

Male.—Length, 13 to 15 millimeters; wing, 12.5 to 14.5.

Female.—Length, 12 to 14.5 millimeters; wing, 13.5 to 16.5.

Head and appendages black. Antennæ of moderate length, in male if bent backward extending approximately to wing root.

Thorax, including the dorsopleural membrane, velvety black. Halteres and legs entirely black. Wings (Plate 1, fig. 7) conspicuously bicolorous, the cells before the cord strongly suffused with brown, beyond the cord paling to light gray; stigma somewhat darker brown; veins dark brown to black. Venation: R_{1+2} entire; R_2 long, perpendicular.

Abdomen somewhat variable in color, in the types with the basal segment and all of segments five to nine, inclusive, involving the genitalia of both sexes, black; segments two to four, inclusive, deep orange, the extreme posterolateral angles of both tergites and sternites black; in female, posterior median portion of first tergite orange. Other specimens that are undoubtedly conspecific have the orange of the tergites much reduced, in cases restricted to the second tergite; in still other cases the caudal borders of the normally orange tergites and sternites are broadly margined with black, greatly restricting the ground color.

Male hypopygium (Plate 2, fig. 32) with the tergite, 9t, and sternite, 9s, fused. Ninth tergite, 9t, with the median region

of the outer portion narrowed and heavily blackened, the tip decurved to an acute point. Basistyle, *b*, produced caudad into a powerful blackened lobe, the tip obtuse, set with abundant short black spines and numerous long black setæ (in figure shown detached, so as not to hide other parts). Dististyle, *d*, somewhat polished black, at tip produced into two more or less opposed lobules that inclose a small rounded notch, the surface of style with abundant setæ. Ninth sternite, *9s*, on either side of median area with a smaller black lobe that is clothed with long black setæ.

Habitat.—China (Szechwan).

Holotype, male, Ginfū-Shan, District Nanchūan, May 1929–31 (*Friedrich*); in Deutsches Entomologisches Museum. Allotopotype, female, in my collection. Paratypes, 10 males and females, mostly in poor condition, Mupin, altitude about 3,500 feet, 1929 (*Graham*).

This very distinct fly is named in honor of the collector of the type specimen. The nearest ally seems to be the subgenotype, *holoserica* (Matsumura), from which the present insect differs notably in the strongly bicolorous, somewhat dimidiate wings.

7. Subgenus TIPULA Linnæus

Tipula LINNÆUS, Systema Naturæ ed. 10 (1758) 585.

Tipula LACKSCHEWITZ, Konowia 9 (1930) 257–278, 2 pls.

Tipula (*Tipula*) EDWARDS, Ann. & Mag. Nat. Hist. X 8 (1931) 75.

Type.—*Tipula oleracea* Linnæus. (Western Palæarctic.)

Antennæ relatively short; verticils long and conspicuous, exceeding the segments in length. Frontal prolongation of head relatively long; nasus elongate.

Mesopleura glabrous, including sternopleurite (or this in cases with setæ, according to Edwards). Tibial spur formula 1–2–2; claws (male) with basal tooth. Squama naked or (more rarely with setæ; veins beyond cord with trichia. Venation: R_{1+2} entire; Rs of moderate length, from one and one-half to nearly two times the length of m-cu, the latter at or close to midlength of cell 1st M_2 , somewhat closer to base in the *ultima* group.

Male hypopygium with tergite and sternite fused into a continuous ring, the suture sometimes feebly indicated posteriorly; median region of tergite produced caudad into a broadly depressed lobe (*oleracea* group) or notched medially (*luteipennis* or *ultima* group); basistyle incomplete, represented by the ven-

tral suture. Inner dististyle (*oleracea* and allies) complex, with four distinct processes, the first, or more posterior, a slender curved spine. Ovipositor with long slender cerci, the narrow tips obtuse; hypoalvæ shorter, compressed.

Species of the subgenus Tipula.

1. PALÆARCTIC EASTERN ASIA

mediolobata Alexander.
moiwana (Matsumura).

subcunctans Alexander (*czizeki* de Jong).

8. Subgenus YAMATOTIPULA Matsumura

Yamatotipula MATSUMURA, Thousand Ins. Japan, Add. 2 (1916) 461-462.

Tipula lateralis Formen-kreis, LACKSCHEWITZ, Naturforscher-Ver. Riga (new series) 15 (1923) 3-16, 33 figs.

Tipula (Yamatotipula) EDWARDS, Ann. & Mag. Nat. Hist. X 8 (1931) 77-78.

Type.—*Tipula nova* Walker (as *Yamatotipula nohiræ* Matsumura). (Eastern Palæarctic.)

Antennæ short (in local species) to very long; flagellar segments only feebly incised; verticils relatively small, shorter than the segments. Frontal prolongation of head moderate in length; nasus elongate.

Mesopleura glabrous. Tibial spur formula 1-1-2 or 1-2-2; claws (male) toothed. Squama naked; outer branches of M with trichia. Venation: R_{1+2} entire; Rs long, nearly if not quite twice m-cu, in extreme cases even longer; M_{3+4} short to very short, m-cu lying close to base of cell 1st M_2 ; second section of M_{1+2} and basal section of M_3 often parallel to one another, but the latter usually shortened by the length and obliquity of m.

Male hypopygium strongly compressed; tergite and sternite fused into a continuous ring; median region of tergite produced caudad into a simple or bifid depressed lobe, the apical margin of which is set with blackened spicules. Gonapophyses usually appearing as pale spatulate blades; a single or double tuft of yellow setæ jutting from notch of ninth sternite. Eighth sternite unarmed. Ovipositor with elongate, somewhat compressed cerci; hypoalvæ long, compressed.

Yamatotipula includes most members of the "Vittatæ," the so-called *lateralis* or *tricolor* groups of the genus. Some included species have the wings clear or nearly so, but most have the pattern distinctly striped longitudinally with brown and white (compare also some *Acutipula*). A few species have m-cu

slightly more distad in position. The subgenus is closest to the typical group *Tipula*.

Species of the subgenus Yamatotipula.

1. PALÆARCTIC EASTERN ASIA

<i>aino</i> Alexander.	<i>patagiata</i> Alexander.
<i>fumida</i> Alexander.	<i>poliocephala</i> Alexander.
<i>latemarginata</i> Alexander.	<i>protrusa</i> Alexander.
<i>morigera</i> Alexander.	<i>stackelbergi</i> Alexander.
<i>nova</i> Walker (<i>fumifasciata</i>	<i>subsulphurea</i> Alexander.
Brunetti, <i>nohirai</i> Matsu-	<i>trifida</i> Alexander.
mura).	<i>usuriensis</i> Alexander.
<i>parvincisa</i> Alexander.	<i>yamamuriana</i> Alexander.

2. PALÆARCTIC CENTRAL ASIA

<i>mongolica</i> Alexander.	<i>poliocephala</i> Alexander (see 1).
<i>nova</i> Walker (see 1).	

9. Subgenus ACUTIPULA Alexander

Tipula (*Acutipula*) ALEXANDER, Arkiv för Zoologi 16 No. 18 (1924) 11-12.

Tipula (*Acutipula*) EDWARDS, Ann. & Mag. Nat. Hist. X 8 (1931) 79.

Type.—*Tipula gaboonensis* Alexander. (Ethiopian.)

Antennæ short in both sexes, the flagellum with very long verticils that exceed the segments in length. Frontal prolongation of head long, with elongate simple nasus.

A group of setæ on propleura. Anepisternum and sternopleurite glabrous. Tibial spur formula 1-2-2; claws (male) with basal tooth. Squama in most or all of the local species (and likewise in the subgenotype) with setæ, these usually few in number, often only three to five, but distinctly present; veins beyond cord unusually glabrous, with trichia lacking or very sparse on outer branches of M and Cu. Venation: R_{1+2} entire; in the subgenotype and most other known species in the Ethiopian fauna;⁴ veins R_{1+2} and R_3 tend to lie far cephalad, greatly reducing cell R_2 , which is strongly pointed at proximal end; Rs short to very short, subequal to m-cu or less; R_{4+5} ending at or beyond wing tip; medial cells full, the veins usually arcuate; m-cu at or before fork of M_{3+4} . Wings of local species usually with a darkened cloud at near midlength of cell Cu, lacking only in a few species (*alboplagiata*, *bipenicillata*, *biramosa*, *di cladura*, *munda*, *obtusiloba*, *oncerodes*, *platycantha*, *saitamæ*, and *tokionis*).

⁴ Alexander, Arkiv för Zoologi 16 No. 18 (1924) 11-12.

Male hypopygium with tergite and sternite fused into a ring; basistyle complete or represented by the ventral suture only; ninth tergite conspicuously produced into a depressed or cylindrical lobe that is either bilobed or simple at apex, this set with microscopic spicules. Outer dististyle broadly flattened, of various shapes; discal setæ very sparse, marginal setæ more abundant, especially near base. Inner dististyle (in local species) with a very characteristic basic plan, but varying infinitely in the details in different species; it consists of a blackened beak on basal portion, with a second outer lobe (Plate 2, fig. 34; Plate 3, fig. 35) that is usually tipped or crowned with setæ; in some species (including *quadrinotata*, the commonest and most wide-spread form in eastern Asia) with an additional sclerotized rod between these two lobes. Caudal margin and surface of eighth sternite variously shaped, in cases with a median lobe, in others with a median crest of setæ back from margin, in still other species with lateral rows of setæ. Ovipositor with slender, straight cerci, the margins smooth; hypoalvæ subequal in length, compressed.

Species of the subgenus Acutipula.

1. PALÆARCTIC EASTERN ASIA

acanthophora Alexander.
alboplagiata Alexander.
bipenicillata Alexander.
bubo Alexander.
cockerelliana Alexander.
kuzuensis Alexander.
obtusiloba Alexander.

quadrinotata Brunetti (*fumicosta* Brunetti, *shirakii* Edwards, *pseudofulvipennis* de Meijere).
saitamæ Alexander.
tokionis Alexander.
turbida Alexander.
vana Alexander.

2. PALÆARCTIC CENTRAL ASIA

atuntzuensis Edwards.
biramosa Alexander.
bistyligera sp. nov.
brunnirostris Edwards.
captiosa Alexander.
cockerelliana Alexander (see 1).
desidiosa Alexander.
di cladura Alexander.
graphiptera Alexander.
incorrupta Alexander.
intacta Alexander.
interrupta Brunetti.
latifasciata Alexander.
megaleuca Alexander.

melampodia sp. nov.
munda Brunetti (*vicaria* Walker, preoccupied).
omeiensis Alexander.
oncerodes Alexander.
pertinax Alexander.
platycantha Alexander.
princeps Brunetti (*fuscinervis* Brunetti).
quadrinotata Brunetti (see 1).
robusta Brunetti (*fumifascipennis* Brunetti, *nigrotibialis* Brunetti).
subturbida Alexander.
yunnanica Edwards.

3. ORIENTAL EASTERN ASIA

de mejerei Edwards.*quadrinotata* Brunetti (see 1).*jacobsoni* Edwards.*umbrinoides* Alexander.

TIPULA (ACUTIPULA) MELAMPODIA sp. nov. Plate 1, fig. 8; Plate 2, figs. 33, 34.

Allied to *graphiptera*; mesonotal præscutum dark gray, with four brown stripes, the anterior ends of the intermediate pair blending with the ground color; legs black, only the femoral bases narrowly yellow; pleura gray; wing pattern almost exactly as in *graphiptera*; basal abdominal segments obscure yellow, the outer segments black; male hypopygium with the median lobe of tergite simple but relatively broad; crest of subterminal lobe or beak high; eighth sternite with a median crest of yellow setæ.

Male.—Length, 16 to 17 millimeters; wing, 21 to 22; antenna, 5.5.

Frontal prolongation of head brownish black, the sides still darker; nasus elongate, black; palpi black. Antennæ with scape and pedicel brownish yellow; flagellum black, the base of the first segment narrowly pale. Head dark gray.

Mesonotal præscutum dark gray, with four brown stripes, the anterior ends of the intermediate pair blending with the ground color; posterior sclerites of mesonotum gray, the scutal lobes variegated by brown. Pleura chiefly light gray; dorsopleural membrane dusky. Halteres brownish black, the apices of knobs slightly paler. Legs with the coxæ gray; trochanters obscure yellow; femora black, only the extreme bases yellow, even narrower on the posterior legs; tibiæ and tarsi black. Wings (Plate 1, fig. 8) with pattern almost exactly as in *graphiptera*; brown, patterned with white, including a band across the bases of the outer medial cells, reaching the wing margin in outer half of cell R₅; white area in cell M not or scarcely confluent with the pale area before stigma, being more or less broadly interrupted near outer end of vein M.

Abdomen with basal tergite darkened; second, and parts of third and fourth segments, chiefly obscure yellow, the succeeding segments passing into black; extreme caudal borders of the segments pale. Male hypopygium with median lobe of tergite (Plate 2, fig. 33, 9*t*) simple but relatively broad at tip, the apex truncated or very indistinctly emarginate, set with black spicules. Outer dististyle and inner dististyle shaped as in figures (Plate 2, fig. 34, *od*, *id*); setæ at crown of outer lobe of inner style about thirty in number; subterminal lobe or beak with the crest

unusually high. Eighth sternite with the median region of caudal margin not produced but with rather abundant setæ, which tend to form a median crest back from the margin.

Habitat.—China (Szechwan).

Holotype, male, Beh-Luh-Din, 30 miles north of Chengtu, altitude 6,000 feet, July 27, 1933 (*Graham*). Paratypes, 1 male, 1 broken specimen, O-Er, 26 miles north of Li-Fan, altitude 10,800 feet, August 16, 1933 (*Graham*).

The general appearance of the present fly is very much like that of *Tipula (Acutipula) graphiptera* Alexander, likewise from western China, but differing very conspicuously in the uniformly black legs. The male sex of *graphiptera* has not been described and it cannot be stated which of the hypopygial characters are distinctive.

TIPULA (ACUTIPULA) BISTYLIGERA sp. nov. Plate 1, fig. 9; Plate 3, fig. 35.

Mesonotum gray, the præscutum with two intermediate brown stripes, the lateral stripes obsolete; pleura gray; antennæ black, the pedicel yellowish brown; legs black, the femoral bases very narrowly yellow; wings with a very strong yellowish brown tinge, sparsely variegated by cream-colored and whitish areas, the latter including a moderately wide obliterate area at cord; abdomen with basal tergites slightly variegated by yellow, trivittate with blackish, the outer segments more uniformly blackened; male hypopygium with median lobe of tergite moderately broad but entire; inner dististyle with outer lobe terminating in two long slender spines; eighth sternite without specially modified lobes or hair brushes.

Male.—Length, about 16 millimeters; wing, 17.6.

Frontal prolongation of head blackish, gray pruinose; nasus distinct; palpi black. Antennæ with scape black, sparsely pruinose; pedicel yellowish brown; flagellum black, the longest verticils a little exceeding the segments. Head gray.

Mesonotal præscutum gray, with two intermediate brown stripes that become obsolete on their anterior third, separated from one another by a relatively wide vitta of the ground; lateral stripes obsolete; scutum uniformly gray, the lobes not variegated by darker; scutellum and mediotergite gray. Pleura gray, the dorsopleural region more brownish. Halteres brown. Legs with the coxæ gray; trochanters brownish yellow; femora black, only the very narrow bases yellow, the amount subequal on all legs; tibiæ and tarsi black. Wings (Plate 1, fig. 9) with a

very strong yellowish brown tinge, sparsely variegated by whitish and cream-colored areas; the latter include spots near base of cell 1st A, before and beyond a somewhat darker brown cloud in cell Cu, and an additional spot just beyond this level in cell M; the white areas include a moderately wide oblitative area at the cord, extending into the bases of cells M_3 and M_4 ; base of cell M_1 whitened; slight pale streaks in cells 2d M_2 and R_5 ; veins dark brown, pale in the oblitative areas.

Abdomen with basal tergite light gray dorsally, broadly brownish black on sides; tergites two and three yellow sublaterally, darkened medially and on lateral portions; succeeding segments becoming more uniformly dark grayish black, margined sublaterally by velvet black, the lateral borders pale, sparsely pruinose; basal sternites yellow, beyond the second passing through dark brown to black. Male hypopygium with the median lobe of the ninth tergite (Plate 3, fig. 35, 9t) relatively broad but entire, truncate across apex. Outer dististyle of moderate size, the apex obtusely rounded. Inner dististyle (Plate 3, fig. 35, id) with the outer lobe extended into two long straight spines that are not decussate but lie more or less parallel, the outer spine a little shorter and stouter than the inner, the latter with about four long setæ on margin near base; beak of style unusually high. Eighth sternite with the caudal margin evenly convex, not produced medially, the apex with abundant setæ that continue cephalad as a median group but nowhere form tufts or rows.

Habitat.—China (Szechwan-Tibet border).

Holotype, male, Mupin, altitude about 13,400 feet, June, 1929 (*Graham*).

The type of male hypopygium of the present fly, more especially the inner dististyle, is approached only by *Tipula* (*Acutipula*) *captiosa* Alexander and *T. (A.) pertinax* Alexander, both of Kansu, western China, which are in all regards entirely different species.

10. Subgenus INDOTIPULA Edwards

Tipula (*Indotipula*) EDWARDS, Ann. & Mag. Nat. Hist. X 8 (1931) 81.

Tipula (*Indotipula*) ALEXANDER, Philip. Journ. Sci. 49 (1932) 231-232.

Type.—*Tipula walkeri* Brunetti. (Oriental.)

Antennæ 12-segmented, the terminal segment reduced to a mere button; flagellum moderately elongate, the longest verticils

subequal in length to or exceeding the segments; flagellar segments simple or more rarely binodose. Frontal prolongation of head short; nasus long and conspicuous. Vertical tubercle very low or lacking.

Mesopleura glabrous. Præscutum having interspaces with very sparse setæ or even quite glabrous. Tibial spur formula 0-0-2 or 0-1-2; spurs of posterior tibiæ unequal; claws (male) toothed. Squama naked; outer medial veins with trichia lacking or greatly reduced in number. Venation: R_{1+2} entire; Rs of moderate length, subequal to m-cu, in cases a little longer or shorter but not disproportionately so; cell M_1 petioled or sessile; m-cu before the level of r-m, at or close to fork of M_{3+4} , the position slightly variable even within the limits of a single species; cell 2d A narrow to very narrow.

Male hypopygium with the tergite separated from the sternite, at least in large part. Posterior margin of tergite produced into a usually bifid lobe that is set with blackened spicules. Basistyle separated from sternite by an incomplete ventral suture. Outer dististyle moderately compressed, with abundant setæ, longer on the margin. Inner dististyle variously modified, in normal forms relatively simple, the outer margin usually with a series of from six to twenty modified setæ that are flattened at their bases. Eighth sternite unarmed. Ovipositor with both cerci and hypoalvæ long and slender, smooth-margined.

Indotipula includes a monotonous aggregation of pale-colored species, with plain wings. It is the dominant group in parts of the Oriental Region and extends its range farther to the southeast than any other subgenus of the genus (*diclava* and *leptoneura* in northern Australia).

Species of the subgenus Indotipula.

1. PALÆARCTIC EASTERN ASIA

suensoni Alexander.

yamata Alexander.

2. PALÆARCTIC CENTRAL ASIA

cinctoterminalis Brunetti (somewhat doubtful, may be an *Acutipula*).

divisa Brunetti.

gracilis Brunetti.

simlensis Edwards.

subyamata Alexander.

tukvarensis Edwards.

walkeri Brunetti (*fulvipennis* Wlk. preoccupied; *tenuipes* Brunetti).

3. ORIENTAL EASTERN ASIA

<i>acentrota</i> Edwards.	<i>leptoneura</i> Alexander.
<i>angustilobata</i> Alexander.	<i>leucopyga</i> van der Wulp (<i>sulaica</i> Walker, nondescript).
<i>brevivittata</i> Edwards.	<i>malaica</i> Edwards.
<i>demarcata</i> Brunetti.	<i>manobo</i> Alexander.
<i>diclava</i> Alexander.	<i>nudicaudata</i> Edwards.
<i>elegantula</i> Brunetti.	<i>okinawensis</i> Alexander.
<i>fuscoangustata</i> Alexander.	<i>palnica</i> Edwards.
<i>gedehicola</i> Alexander.	<i>riverai</i> Alexander.
<i>ifugao</i> Alexander.	<i>sinabangensis</i> de Meijere.
<i>kinabaluensis</i> Edwards.	<i>ubensis</i> Alexander.
<i>korinchiensis</i> Edwards.	<i>vilis</i> Walker.
<i>latilobata</i> Alexander.	

11. Subgenus PAPUATIPULA Alexander

Tipula (*Papuatipula*) ALEXANDER, Proc. Linn. Soc. New South Wales 59 (1934) in press.

Type.—*Tipula novæ-britannicæ* Alexander. (Australasian.)

Antennæ 13-segmented; flagellar segments with verticils that greatly exceed the segments in length. Frontal prolongation of head elongate, subequal to remainder of head; nasus distinct.

Tibial spur formula 1-2-2; spurs long and conspicuous. Squama naked; trichia of veins beyond cord unusually sparse and scattered there being a loose series on R_{4+5} and M_1 . Venation: R_{1+2} entirely atrophied or represented only by a short basal spur; R_s unusually short but not transverse, approximately two-thirds m-cu; R_{2+3} very long and straight, exceeding twice m-cu; vein R_3 elongate, lying unusually close to costal border of wing, subequal in length to R_{2+3} ; cell 1st M_2 elongate, its inner end strongly pointed; cell M_1 deep; m-cu uniting with M_{3+4} some distance before its fork, usually at near midlength.

Male hypopygium with the tergite separated from the sternite by a suture, fused only at extreme cephalic portion; basistyle fused with sternite. Tergite notched medially. Outer dististyle armed with a spinous point. Eighth sternite unarmed.

This subgenus has proved to be the most characteristic one in New Guinea and its satellite islands and will probably be found to be very rich in number of species when the region becomes better known. It is most nearly allied to *Acutipula* Alexander, *Tipulodina* Enderlein, and *Indotipula* Edwards, especially the first of these. It is distinguished by the venation, naked squama, and fundamentals of the male hypopygium, as the unfused tergite and sternite, notched tergite, and armed outer dististyle.

Species of the subgenus Papuatipula.

3. ORIENTAL EASTERN ASIA

<i>divergens</i> de Meijere.	<i>novæ-britannicæ</i> Alexander.
<i>leucosticta</i> Alexander.	<i>omissinervis</i> (de Meijere).
<i>meijereana</i> Alexander (<i>denta-</i> <i>ta</i> de Meijere, preoccupied).	

12. Subgenus TIPULODINA Enderlein

Tipulodina ENDERLEIN, Zool. Jahrb., Syst. 32 (1912) 30-31.

Tipulodina BRUNETTI, Rec. Indian Mus. 15 (1918) 270-273.

Tipula (*Tipulodina*) EDWARDS, Ann. & Mag. Nat. Hist. X 8 (1931) 76.

Tipula (*Tipula*) ALEXANDER, Philip. Journ. Sci. 49 (1932) 232.

Type.—*Tipulodina magnicornis* Enderlein. (Oriental.)

Antennæ relatively short to long; flagellar segments not greatly incised; verticils long and conspicuous, exceeding the segments in length except in those species where the antennæ are very long. Frontal prolongation of head relatively short; nasus long and conspicuous. Usually with a small papillalike vertical tubercle.

Mesopleura glabrous; præscutal interspaces with very sparse setæ. Legs very long but not unusually slender; tibial spur formula 1-2-2; claws simple. Squama naked; outer medial veins with trichia quite lacking; outer radial veins often with a sparse series. Venation: R_{1+2} entire; Rs short to very short, less than m-cu, which is subequal to or longer than the distal section of Cu_1 , cell M_4 thus being very short and broad; R_{4+5} long, decurved, ending beyond the wing tip; m-cu variable in position, from close to the fork of M_{3+4} to near midlength of this vein; cells M_1 and 1st M_2 full; cell 2d A narrow to very narrow.

Male hypopygium with the tergite separated from the sternite; basistyle fused with the sternite; ventrad of the dististyles, the basistyle is produced into a sclerotized rod or hook, joined at the base by a suture and not a direct prolongation of the basistyle. Outer dististyle small, broadly flattened. Ninth tergite with caudal margin more or less transverse, with a group of spinous setæ on either side of the median line. Eighth sternite often produced caudal into an acute median point. Ovipositor with cerci relatively stout, gently upcurved, the tips obtuse; hypoalvæ long, compressed.

The species of *Tipulodina* are all of large or medium size, with very long legs that are almost invariably ringed with snowy

white on the femora, tibiæ, or basitarsi. Such annuli are lacking or obscured in only a few species in the local fauna. The wings are usually crystal clear, iridescent, heavily patterned with dark or at least with the wing tip darkened; a few species have the wings beautifully tinted with amber yellow; still others have a darkened cloud at near midlength of cell M. The subgenus is eminently characteristic of the Oriental Region, with fewer species in the Ethiopian and others extending northward into Palæarctic Eastern Asia.

Species of the subgenus Tipulodina.

1. PALÆARCTIC EASTERN ASIA

joana Alexander. *taiwanica* Alexander.
nipponica Alexander.

2. PALÆARCTIC CENTRAL ASIA

monozona Edwards. *patricia* Brunetti.

3. ORIENTAL EASTERN ASIA

<i>ætherea</i> de Meijere.	<i>magnicornis</i> Enderlein.
<i>albiprivata</i> Edwards.	<i>mckeani</i> Cockerell.
<i>barraudi</i> Edwards.	<i>micracantha</i> Alexander.
<i>brunettiella</i> Alexander.	<i>pampangensis</i> Alexander.
<i>cagayanensis</i> Alexander.	<i>pedata</i> Wiedemann.
<i>ceylonica</i> Edwards.	<i>sandersoni</i> Edwards.
<i>cinctipes</i> de Meijere.	<i>scimitar</i> Alexander.
<i>contigua</i> Brunetti.	<i>sidapurensis</i> Edwards.
<i>deprivata</i> Alexander.	<i>simillima</i> Brunetti.
<i>fumifinis</i> Walker.	<i>succinipennis</i> Alexander.
<i>fuscitarsis</i> Edwards.	<i>tabuanensis</i> Alexander.
<i>gracillima</i> Brunetti.	<i>tinctipes</i> Edwards.
<i>lumpurensis</i> Edwards.	<i>varitarsis</i> Alexander.
<i>luzonica</i> Alexander.	<i>venusta</i> Walker.

13. Subgenus ARCTOTIPULA Alexander

Tipula (*Arctotipula*) ALEXANDER, Philip. Journ. Sci. 52 (1933) 410-411.

Type.—*Tipula besselsi* Osten Sacken. (Nearctic, Polar.)

Antennæ of moderate length, the flagellar segments feebly incised, with verticils that are shorter than the segments. Nasus in most cases relatively short, sometimes lacking.

Body conspicuously hairy, with setæ on all coxæ and usually on sternopleurite and meron but not on anepisternum. Tibial spur formula 1-2-2; claws simple. Squama naked; veins beyond cord without trichia or with these much reduced in size and

number, most persistent as a loose series on R_{4+5} ; in some species, as *gavronskii*, the trichia are more abundant.

Abdomen often depressed. Male hypopygium of simple structure; tergite and sternite separate; eighth sternite unarmed. Terminal abdominal segments in female abruptly narrowed, the ovipositor very small; cerci moderately elongate and only weakly sclerotized, with smooth margins; hypovalvæ small and compressed.

The subgenus is distinguished from *Vestiplex* chiefly by the long, pale body vestiture, the unusually glabrous nature of the wing veins, and the structure of the ovipositor. *Tipula tundrensis* is aberrant in the subgenus and may possibly be better referred to *Vestiplex* despite the smooth-margined cerci. The species are chiefly far northern in their distribution.

Species of the subgenus Arctotipula.

1. PALÆARCTIC EASTERN ASIA

gavronskii Alexander.

popoffi Alexander.

hirtitergata Alexander.

tundrensis Alexander.

14. Subgenus VESTIPLEX Bezzi

Tipula (Vestiplex) BEZZI, Ann. Mus. Civ. Nat. Stor. Genova 51 (1924) 230-231.

Tipula (Vestiplex) EDWARDS, Ann. & Mag. Nat. Hist. X 8 (1931) 79-80.

Tipula (Vestiplex) ALEXANDER, Philip. Journ. Sci. 52 (1933) 396-398.

Type.—*Tipula cisalpina* Riedel. (Western Palæarctic.)

Antennæ short to elongate, in males of many species with flagellar segments very strongly incised; verticils of moderate length. Frontal prolongation of head elongate; nasus present or lacking.

Thoracic pleura usually glabrous, in cases (as *arctica*) with numerous setæ on sternopleurite. Tibial spur formula 1-2-2; claws (male) simple or with basal tooth (as *arctica*); legs usually stout, especially in females. Squama naked; branches of M with sparse to more abundant trichia. Venation: R_{1+2} entire; Rs long, fully one-half longer than m-cu or often considerably longer; m-cu at or close to fork of M_{3+4} and approximately opposite one-third to one-half the length of cell 1st M_2 .

Male hypopygium in many species with the posterior half of tergite forming a shallow saucer, in some species heavily sclero-

tized and blackened, having the lateral angles produced caudad into acute spines. Still other species have the tergite completely divided longitudinally by pale membrane. The modifications of the hypopygium in this subgenus have been discussed in greater detail in another paper.⁵ Ovipositor with the cerci strong and powerfully constructed, heavily sclerotized, horizontally placed and with the outer margin serrate; hypovalvæ very small or rudimentary, not or scarcely extending beyond the bases of the cerci. In several species the margins of the cerci have the teeth obtuse and evidently in process of being eliminated. Several species in the local fauna have been placed in *Vestiplex* with considerable question, many of these (all where the female sex is definitely known) have the cerci quite smooth and the hypovalvæ better developed. The following species, referred to *Vestiplex* in the past, are questionable and are better placed in *Oreomyza* until their characters are better known: *arisanensis*, *coxitalis*, *deserrata*, *foliacea*, *nestor*, *optanda*, *parvapidulata*, *quadrifulva*, *sternotuberculata*, and *terebrata*. The disposition of *tundrensis* in *Arctotipula* has been discussed under this generic name. Still further species belonging to the so-called *himalayensis* group, including *himalayensis* and *inæquidentata*, may likewise be found to fall in some other group but are retained herewith in *Vestiplex* until the female sex is better known.

Vestiplex includes a considerable part of the so-called "Marmoratæ," having marbled or marmorate wing patterns (compare also *Nippotipula*, *Sinotipula*, *Oreomyza*, and *Lunatipula*). The subgenus is widely distributed throughout the Holarctic region, more especially in the boreal portions and in the mountainous districts to the south.

Species of the subgenus Vestiplex.

1. PALÆARCTIC EASTERN ASIA

<i>asio</i> Alexander.	<i>pallitergata</i> Alexander.
<i>bicornuta</i> Alexander.	<i>serricauda</i> Alexander.
<i>biserra</i> Edwards.	<i>serridens</i> Alexander.
<i>coquilletiana</i> Alexander.	<i>subapterogyne</i> Alexander.
<i>excisoides</i> Alexander.	<i>subcentralis</i> Alexander.
<i>immunda</i> Alexander.	<i>tchukchi</i> Alexander.
<i>jakut</i> Alexander.	<i>teshionis</i> Alexander.
<i>kamtchatkana</i> Alexander.	<i>transbaikalica</i> Alexander.
<i>kuwayamai</i> Alexander.	<i>verecunda</i> Alexander.
<i>nokonis</i> Alexander.	

⁵ Alexander, Philip. Journ. Sci. 52 (1933) 396.

2. PALÆARCTIC CENTRAL ASIA

<i>arctica</i> Curtis (<i>aquilonia</i> Erichson).	<i>mittelli</i> Edwards.
<i>avicularia</i> Edwards.	<i>nigroapicalis</i> Brunetti.
<i>bifida</i> Alexander.	<i>pleuracantha</i> Edwards.
<i>divisotergata</i> Alexander.	<i>quasimarmoratipennis</i> Brunetti.
<i>edentata</i> Alexander.	<i>reposita</i> Walker (<i>brevis</i> Brunetti).
<i>grahami</i> Alexander.	<i>scandens</i> Edwards.
<i>hedini</i> Alexander.	<i>styligera</i> Alexander.
<i>himalayensis</i> Brunetti.	<i>subcarinata</i> Alexander.
<i>hummeli</i> Alexander.	<i>subscripta</i> Edwards.
<i>immota</i> Alexander.	<i>subtineta</i> Brunetti.
<i>inæquidentata</i> Alexander.	<i>tardigrada</i> Edwards.
<i>kwanhsienana</i> Alexander.	<i>testata</i> sp. nov.
<i>leucoprocta</i> Mik.	<i>tumulta</i> Alexander.
<i>mediovittata</i> Mik.	<i>virgatula</i> Riedel.

3. ORIENTAL EASTERN ASIA

<i>gedehana</i> de Meijere.	<i>papandajanica</i> Edwards.
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TIPULA (VESTIPLEX) TESTATA sp. nov. Plate 1, fig. 10; Plate 3, fig. 36.

Thorax yellow, the præscutum with three poorly indicated olive-brown stripes; antennæ (male) elongate, approximately one-half the length of body; flagellum black; legs black, the femoral bases narrowly yellow; wings tinged with brown, vaguely patterned with whitish areas, including an incomplete band beyond stigma; cell Sc uniformly black; R_{1+2} entire; basal abdominal tergites yellow, the outer segments black; male hypopygium with the basistyle terminating in an acute spine.

Male.—Length, 11 to 12 millimeters; wing, 12 to 13.5; antenna, 6.

Frontal prolongation of head orange-yellow, including the elongate nasus; palpi brown. Antennæ (male) elongate, if bent backward extending approximately to opposite the base of the fourth abdominal segment; scape and pedicel yellow, flagellum black, the base of the first flagellar segment paler; flagellar segments with verticils much shorter than the segments. Head brownish yellow.

Mesonotal præscutum golden yellow, with three olive-brown stripes that are poorly defined against the ground, the median one insensibly divided by paler color on posterior half; scutal lobes yellow, each with two olive-brown areas; scutellum brownish yellow; mediotergite more golden yellow, the two latter

sclerites with vague indications of a capillary dark vitta. Pleura uniformly yellow. Halteres with stem yellow, the knobs black. Legs with coxæ and trochanters yellow; remainder of legs black, the femoral bases rather narrowly yellow. Wings (Plate 1, fig. 10) with a weak brown tinge, very vaguely marked with more-whitish areas; prearcular field yellow; cell C brownish yellow, somewhat darker on outer end; cell Sc uniformly blackened throughout its length; stigma and a confluent cloud on anterior cord darker brown; a small dark cloud at origin of Rs; the whitish markings include an incomplete poststigmatal fascia that passes through cell 1st M_2 into the base of cell M_3 ; extensive whitish areas before and beyond origin of Rs; bases of cells R, M, Cu, and the anals pale, cell Cu_1 restrictedly darkened, yellow at extreme base; veins dark brown. Venation: R_{1+2} with a series of trichia virtually to tip; petiole of cell M_1 a trifle longer than m.

Basal abdominal tergites yellow, beyond the second tergite more brownish yellow; fifth and succeeding segments, including the entire hypopygium, intense black; sternites colored like the tergites but lateral borders of outer blackened segments more conspicuously pale. Male hypopygium (Plate 3, fig. 36) with the sternite and tergite, 9t, fused on cephalic half, separated by a suture on posterior half; basistyle, *b*, entirely cut off from the sternite, at apex produced into a gently curved black spine, the tip acute. Ninth tergite, 9t, narrowly divided at midline by pale membrane; lateral lobes moderately elongate, black, with conspicuous black setæ; ventrad of lateral lobes with the usual glabrous blackened protuberances. Outer dististyle dusky, flattened, with abundant black setæ. Inner dististyle, *id*, with a blackened knob at base. Eighth sternite, 8s, unarmed.

Habitat.—China (Szechwan).

Holotype, male, Beh-Luh-Din, 30 miles north of Chengtu, altitude 6,000 feet, August 8 to 10, 1933 (*Graham*). Paratopotypes, 3 males, August 12 to 17, 1933.

Tipula (Vestiplex) testata is readily told from all other small regional species of the subgenus that have the basistyle of the male hypopygium armed with a spine, by the yellow coloration of the thorax and very elongate antennæ of the male.

15. Subgenus OREOMYZA Pokorny

Oreomyza POKORNY, Wien. Ent. Zeit. 6 (1887) 50.

Tipula (Oreomyza) EDWARDS, Ann. & Mag. Nat. Hist. X 8 (1931) 75-76.

Type.—*Oreomyza glacialis* Pokorny. (Western Palæarctic.)

Antennæ short to moderately elongate, 13- to 15-segmented; flagellar segments weakly to strongly incised; verticils of moderate length. Frontal prolongation of head relatively elongate; nasus of moderate length or lacking (*carinifrons* group).

Mesopleura glabrous. Tibial spur formula normally 1-2-2; claws (male) simple, or more usually (as in *marmorata*, *trivittata*, and *unca* groups) with basal tooth. Squama naked; outer branches of M with trichia. Venation: R_{1+2} entire or, in numerous species (*mutila* group), entirely or partly atrophied; Rs of moderate length, exceeding m-cu, the latter some distance beyond fork of M, except in the *marmorata* and a few other groups.

Male hypopygium with tergite and sternite distinct; basistyle complete, at least in the majority of species; in certain forms, the basistyle produced caudad into an obtuse or acute lobe. Outer dististyle usually depressed, often dilated on outer portion into a more or less triangular head; in cases, dististyle small and nearly cylindrical. Eighth sternite simple or provided with hair brushes. Ovipositor with slender, smooth-margined, sclerotized cerci; hypovalvæ compressed, shorter than the cerci.

Oreomyza is very rich in species throughout the entire Holarctic region, being especially well developed in the local fauna. It includes the majority of the so-called "Marmoratæ," species with the wings variously clouded and spotted with brown, gray, and pale colors. Many forms in the local fauna have the wings unmarked or nearly so. The essential point of difference from *Lunatipula* lies in the glabrous squamæ, a character that in some groups, at least, may not prove to be of fundamental importance and which may tend to separate species that are in reality nearly allied. I am modifying the limits of the group to include species with simple and with toothed claws in the male sex.

As above constituted, *Oreomyza* includes several diverse elements, some of which later may be removed to other groups. The chief points of contact are with *Vestiplex* and *Lunatipula*, as discussed before. The host of species in our fauna are divisible into several natural groups, of which the following may be outlined provisionally at this time:

1. *arisanensis* group, including *arisanensis* and *foliacea*.
2. *coxitalis* group, including *coxitalis* and *sternotuberculata*.

3. *carinifrons* group, including *carinifrons*, *crawfordi*, *gynaptera*, and *malaisei*.
4. *flavolineata* group, including *curvicauda*, *dichroistigma*, *fortistyla*, *isshikii*, *nigrosignata*, and probably *westwoodiana*.
5. *juncea* group, including *longicauda* and *mystica*.
6. *marmorata* group, including *coreana*, *cupida*, *docilis*, *fidelis*, and *kiushiuensis*.
7. *mutila* group, including many species, possibly artificially distributed, as *edwardsella*, *flavocostalis*, *futilis*, *hibii*, *hylæa*, *latiflava*, *mutiloides*, *obnata*, *percara*, *quadrifasciata*, *striatipennis*, *subfutilis*, *submutila*, *sunda*, and others.
8. *seticellula* group, including *seticellula*.
9. *trivittata* group (claws of male toothed), as *apicispina* and many others.
10. *variipennis* group (claws of male simple), as *mesacantha* and many others.
11. *unca* or *borealis* group, including *amurensis*.

Species of the subgenus Oreomyza.

1. PALÆARCTIC EASTERN ASIA

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| <p><i>amurensis</i> Alexander.
 <i>apicispina</i> Alexander.
 <i>arisanensis</i> Edwards.
 <i>autumna</i> Alexander.
 <i>chernavini</i> Alexander.
 <i>coreana</i> Alexander.
 <i>coxitalis</i> Alexander.
 <i>crawfordi</i> Alexander.
 <i>cupida</i> Alexander.
 <i>curvicauda</i> Alexander.
 <i>depressa</i> Alexander.
 <i>derbecki</i> Alexander.
 <i>dershavini</i> Alexander.
 <i>dichroistigma</i> Alexander.
 <i>docilis</i> Alexander.
 <i>edwardsella</i> Alexander (<i>flavico</i>
 <i>costa</i> Edwards, preoccupied).
 <i>famula</i> sp. nov.
 <i>fidelis</i> Alexander.
 <i>flavocostalis</i> Alexander.
 <i>foliacea</i> Alexander.
 <i>fortistyla</i> Alexander.
 <i>futilis</i> Alexander.
 <i>gynaptera</i> Alexander.
 <i>hibii</i> Alexander.
 <i>hylæa</i> Alexander.
 <i>illegitima</i> Alexander.
 <i>isshikii</i> Alexander.
 <i>kiushiuensis</i> Alexander.</p> | <p><i>lætibasis</i> Alexander.
 <i>longicauda</i> Matsumura.
 <i>lundströmiana</i> Alexander.
 <i>machidai</i> Alexander.
 <i>malaisei</i> Alexander.
 <i>matsumuriana</i> Alexander.
 <i>mendax</i> Alexander.
 <i>mesacantha</i> Alexander.
 <i>mitiphora</i> Alexander.
 <i>mystica</i> Alexander.
 <i>nestor</i> Alexander.
 <i>nigrosignata</i> Alexander.
 <i>nippoalpina</i> Alexander.
 <i>obnata</i> Alexander.
 <i>otiosa</i> Alexander.
 <i>parvapiculata</i> Alexander.
 <i>phæopasta</i> Alexander.
 <i>pluriguttata</i> Alexander.
 <i>politostriata</i> Alexander.
 <i>pollex</i> Alexander.
 <i>quadrifasciata</i> Matsumura (<i>aluco</i>
 Alexander).
 <i>quadrifulva</i> Edwards (probably
 here).
 <i>quadrispicata</i> Alexander.
 <i>sachalinensis</i> Alexander.
 <i>sempiterna</i> Alexander.
 <i>seticellula</i> Alexander.
 <i>s. longiligula</i> Alexander.</p> |
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Species of the subgenus Oreomyza—Continued.

1. PALÆARCTIC EASTERN ASIA—continued.

<i>shomio</i> Alexander.	<i>terebrata</i> Edwards.
<i>sibiriensis</i> Alexander.	<i>tetracantha</i> Alexander.
<i>sternotuberculata</i> Alexander.	<i>tridentata</i> Alexander.
<i>strix</i> Alexander.	<i>trupheoneura</i> Alexander.
<i>subfutilis</i> Alexander.	<i>uenoi</i> Alexander.
<i>subyusou</i> Alexander.	<i>westwoodiana</i> Alexander.
<i>superciliosa</i> Alexander.	<i>yusou</i> Alexander.
<i>taikun</i> Alexander.	<i>yusouoides</i> Alexander.
<i>tantula</i> Alexander.	

2. PALÆARCTIC CENTRAL ASIA

<i>amytis</i> Alexander.	<i>lionota</i> Holmgren.
<i>bipendula</i> Alexander.	<i>macarta</i> Alexander.
<i>carinifrons</i> Holmgren.	<i>multistrigata</i> Alexander.
<i>ciliata</i> Lundström.	<i>mupinensis</i> Alexander.
<i>crassicornis</i> Zetterstedt.	<i>mutiloides</i> Alexander.
<i>cruciata</i> Edwards.	<i>optanda</i> Alexander.
<i>deserrata</i> Alexander.	<i>pedicellaris</i> Alexander.
<i>dolosa</i> Alexander.	<i>percara</i> Alexander.
<i>finitima</i> Alexander	<i>resupina</i> Alexander.
<i>glaucocinerea</i> Lundström.	<i>rudis</i> sp. nov.
<i>haplorhabda</i> sp. nov.	<i>stagnicola</i> Holmgren.
<i>hirsutipes</i> Lackschewitz.	<i>striatipennis</i> Brunetti.
<i>jedoensis</i> Alexander.	<i>submutila</i> Alexander.
<i>latiflava</i> Alexander.	<i>tetragramma</i> Edwards.
<i>latistriga</i> Edwards.	<i>tetramelania</i> sp. nov.
<i>legalis</i> Alexander.	<i>tristriata</i> Lundström.
<i>leucosema</i> Edwards.	<i>vitiosa</i> Alexander.
<i>leucosticta</i> Edwards.	<i>vivax</i> Alexander.
<i>limbinervis</i> Edwards.	

3. ORIENTAL EASTERN ASIA

sunda Alexander.

TIPULA (OREOMYZA) FAMULA sp. nov. Plate 1, fig. 11; Plate 3, fig. 37.

General coloration gray, the præscutum with three brown stripes; setigerous punctures of interspaces sparse but conspicuous; a median dark vitta on posterior sclerites of mesonotum; antennæ (male) unusually long, exceeding one-half the length of body, the flagellar segments uniformly darkened, strongly nodulose; wings brown, sparsely variegated by dark brown and pale yellow areas, the latter including an incomplete fascia beyond cord; cell C infumed; R_{1+2} complete; basal abdominal segments reddish yellow, the outer segments black; male hypopygium with the caudal margin of tergite tridentate; eighth sternite with a fringe of long yellow setæ.

Male.—Length, about 12 millimeters; wing, 13; antenna, about 6.8.

Frontal prolongation of head dark gray; nasus distinct; palpi black. Antennæ (male) unusually long, exceeding one-half the length of body, if bent backward extending about to the base of the fourth abdominal tergite; scape and pedicel obscure yellow; succeeding segments almost uniformly dark brown; flagellar segments beyond the first strongly nodulose, much as in *serta* and allies; longest verticils subequal in length to the segments; terminal segment exceeding one-half the length of the penultimate. Head brownish gray; anterior vertex with an impressed median line back from the summit of the tubercle.

Mesonotal præscutum gray, with three brown stripes, the lateral pair entire, the median stripe with the central half entire, the lateral portions paler gray, this latter color continuing caudad almost to the posterior end of stripe as a delicate line just inside the dark lateral border of the stripe; setigerous punctures of the interspaces sparse, dark brown; scutum gray, each lobe with two dark brown areas; posterior sclerites of notum gray; a slightly interrupted brown median vitta extending from the suture to the abdomen. Pleura gray; dorsopleural membrane buffy yellow. Halteres obscure yellow, the bases of knobs dusky. Legs with the coxæ gray; trochanters yellow; femora obscure yellow, the tips rather broadly but weakly dark brown; tibiæ obscure yellow, the tips more extensively dark brown; tarsi black; claws (male) with a weak subbasal tooth. Wings (Plate 1, fig. 11) with a strong brown tinge, sparsely variegated by darker brown and cream-colored areas; prearcular field and cell Sc clear yellow; cell C infumed; stigma and a confluent area on anterior cord darker brown; wing apex almost uniformly darkened, a trifle paler in the outer medial field; an incomplete pale crossband beyond stigma, narrowly reaching the costa at vein R_{1+2} , behind extending into cell M_3 ; cells R and M darkened medially, variegated by pale at bases and in outer ends; a broad pale seam along outer third of vein 1st A; veins brown, brighter in the pale areas. Macrotrichia of veins relatively abundant; on more than basal half of R_{1+2} ; a group of about seventeen trichia on posterior border of stigma. Venation: R_{1+2} entire but pale on distal third; cell 1st M_2 slightly elongate, the second section of M_{1+2} exceeding twice the basal section.

Abdomen with first segment brownish gray; succeeding three or four segments almost uniformly reddish yellow, the outer segments blackened. Male hypopygium (Plate 3, fig. 37) with the tergite, 9*t*, entirely separated from the sternite, 9*s*; basistyle entirely cut off from the sternite, its caudal margin not produced. Ninth tergite, 9*t*, with the caudal margin tridentate, the lateral lobes obtuse, the median lobe acute and sending a median carina back onto the dorsal surface of the tergite; dorsal surface with abundant erect setæ. Outer dististyle broadly expanded on outer half. Inner dististyle, *id*, with a glabrous lobe on outer margin, directed outward; posterior basal angle of style produced caudad into a shorter, more obtuse lobe that is provided with scattered setæ. Eighth sternite, 8*s*, on and near caudal margin with a dense median brush of long yellow setæ.

Habitat.—China (Chekiang).

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

The present fly is very different from other regional species of *Oreomyza* in the elongate nodulose antennæ, which are very similar to the otherwise quite different *Tipula* (*Oreomyza*) *lundströmiana* Alexander and other members of the *serta* group. Aside from the antennæ, the present fly suggests species such as *T. (O.) futilis* Alexander and *T. (O.) legalis* Alexander, yet is very different.

TIPULA (OREOMYZA) TETRAMELANIA sp. nov. Plate 1, fig. 12; Plate 3, fig. 38.

Mesonotal præscutum gray, with four polished black stripes; antennal flagellum black; knobs of halteres blackened; legs yellow, the tips of the femora and tibiæ conspicuously blackened; wings brown, sparsely variegated by whitish and darker brown, including an incomplete pale fascia beyond the stigma; R_{1+2} entire; basal abdominal segments yellow, inconspicuously lined with darker; fifth and succeeding segments black; male hypopygium with the caudal margin of tergite trilobed; eighth sternite with a simple fringe of setæ on caudal border.

Male.—Length, 10 to 11 millimeters; wing, 10.5 to 12.

Female.—Length, 14 to 15 millimeters; wing, 13.5 to 14.

Frontal prolongation of head brown, narrowly blackened above; nasus elongate; palpi brown, the incisures paler, the outer segments brownish black. Antennæ moderately elongate, in male if bent backward extending nearly to root of halteres; scape and pedicel obscure yellow; flagellum black; verticils a

little longer than the segments. Head gray; anterior vertex relatively narrow.

Pronotum gray. Mesonotal præscutum gray with four conspicuous, polished black stripes, the intermediate pair separated by a diffuse line of the ground color; scutum gray, the lobes more blackened; scutellum polished black; mediotergite black, sparsely pruinose on sides. Pleura black, heavily pruinose, the ventral sternopleurites less heavily so, to appear somewhat polished. Halteres with the stem yellow, the knobs blackened. Legs with the coxæ dark brown, sparsely pruinose; femora and tibiæ obscure yellow, the tips conspicuously blackened; tarsi black, the proximal ends of basitarsi a little paler; claws (male) with basal spine. Wings (Plate 1, fig. 12) with the ground color brown, variegated by whitish and sparse darker brown areas; prearcular region and cell Sc yellow, cell C more brownish yellow; stigma and a confluent cloud on anterior cord darker brown; a narrow and incomplete pale crossband beyond cord, including bases of cells R_2 , R_3 , and R_5 ; in cases, the outer medial field pale, in still other specimens being of the ground color; a dark cloud in prearcular field, following the radial vein; an entire dark band extending from vein R to the posterior margin at near midlength of the basal cells of wing; veins brownish black, more yellowish in the flavous portions. Trichia of veins relatively short, virtually lacking on 1st A. Venation: R_{1+2} entire, with trichia except on the pale outer third; cell 1st M_2 relatively small.

Abdomen (male) with the basal four segments chiefly light yellow, the tergites usually very vaguely and indistinctly darkened medially and on the sides, the latter more evident, in cases the markings more distinct; sternites similarly light yellow, unmarked; outer abdominal segments, including hypopygium, black. In female, the basal abdominal tergites are more distinctly trivittate with black; genital shield obscure yellow. Male hypopygium (Plate 3, fig. 38) with the basistyle relatively small, entirely cut off from sternite by sutures. Ninth tergite, $9t$, a simple transverse plate, without blackened lobes or other modifications; caudal portion narrowed, the margin with three lobes, the lateral lobes broader and more obtuse than the slender median lobes. Outer dististyle, od , a little flattened, sinuous, with unusually long setæ. Inner dististyle, id , with the caudal or posterior margin notched, with a small, pale, conical point near

base. Eighth sternite, 8s, with posterior margin provided with a simple fringe of long yellow setæ, smaller and restricted in number near the midline. Ædeagus very stout. Ovipositor with the cerci long and slender, straight.

Habitat.—China (Szechwan).

Holotype, male, Beh-Luh-Din, 30 miles north of Chengtu, altitude 6,000 feet, August 18, 1933 (*Graham*). Allotopotype, female, August 2, 1933. Paratopotypes, 7 males and females, August 16 to 27, 1933. Paratype, 1 male, Mu-Sang-Tsai, 10 miles northwest of Wei-Chow, altitude 8,000 to 10,000 feet, July 2 to 6, 1933 (*Graham*).

Despite marked differences in coloration of body and wings, I believe the present fly to be related to *Tipula (Oreomyza) cruciata* Edwards and allies. It is amply distinct in the pattern of the thorax and abdomen, and in the details of structure of the male hypopygium, especially of the tergite.

TIPULA (OREOMYZA) RUDIS sp. nov. Plate 1, fig. 13; Plate 3, figs. 39 and 40.

Most nearly allied to *finitima*; mesonotal præscutum brownish gray, with four slightly darker brown stripes; scutellum uniformly darkened; wings strongly suffused with brownish yellow, the stigma darker; oblitative areas much restricted; basal abdominal segments yellowish, the outer segments darkened; male hypopygium with the basistyle large, entire, its caudal end produced into a broad, truncated, blackened lobe; eighth sternite with a fringe of setæ.

Male.—Length, about 15 millimeters; wing, 16; antenna, about 5.

Frontal prolongation of head brownish gray; nasus distinct; palpi brownish black. Antennæ (male) moderately elongate, as shown by the measurements; scape brownish yellow; pedicel yellow; flagellar segments weakly bicolorous, the basal enlargements of the segments dark brown, the remainder somewhat paler brown; longest verticils subequal in length to the segments. Head dark gray, the anterior vertex badly damaged in the unique type.

Mesonotal præscutum brownish gray, with indications of four slightly darker, more brownish stripes; scutum with lobes uniformly dark gray; posterior sclerites of notum dark gray. Pleura uniformly dark gray; dorsopleural membrane buffy yellow. Halteres with stem brownish yellow, the knobs darkened. Legs with the coxæ gray; trochanters brownish yellow; re-

mainder of legs broken. Wings (Plate 1, fig. 13) with a brownish yellow tinge, cells C, Sc, and Cu more saturated; stigma slightly darker brown; oblitative areas before and beyond stigma and across cord greatly reduced, very inconspicuous, especially the latter; veins brown. Venation: R_{1+2} entire; Rs somewhat longer than m-cu.

Abdomen with basal segments yellow, the tergites scarcely darkened medially; on third and succeeding tergites a narrow dark sublateral stripe begins, broadening behind; outer abdominal segments darkened. Male hypopygium (Plate 3, fig. 39) with the basistyle, *b*, very large, entirely cut off from the sternite, its caudal end broadly produced into a short, obtusely truncated, blackened lobe. Ninth tergite (Plate 3, fig. 40, 9*t*) long, narrowed on posterior third, with heavily blackened lateral lobe on either side and a low, paler, median lobe; dorsomedian portion of tergite narrowly but distinctly divided by pale membrane. Outer dististyle small, weakly clavate, with long setæ. Inner dististyle, *id*, with a setiferous lobe at base of posterior portion, connected with the head portion by extensive, almost clear membrane. Ninth sternite profoundly incised; on its margin, ventrad and cephalad of the basistyle, a tumid blackened lobe whose posterior portion bears abundant setæ. Eighth sternite, 8*s*, with median region of caudal margin very gently concave and provided with a fringe of long setæ.

Habitat.—China (Szechwan).

Holotype, male, O-Er, 26 miles north of Li-Fan, altitude 9,000 feet, August 6 to 16, 1933 (*Graham*).

The nearest described ally is the very similar *Tipula* (*Oreomyza*) *finitima* Alexander (Kansu), which differs especially in the structure of the male hypopygium, notably the basistyle and inner dististyle.

TIPULA (OREOMYZA) HAPLORHABDA sp. nov. Plate 1, fig. 14.

General coloration of thorax brownish gray, the præscutum with four dark brown stripes; femora black, with a broad yellow subterminal ring on all legs; wings whitish, variegated by grayish brown and darker brown areas, the pattern not so definitely quadrifasciate as in most members of the subgroup; white crossband beyond cord unusually broad; cell 2d A almost undarkened; vein R_{1+2} represented by a spur that includes about one-half the normal length of the vein.

Female.—Length, about 22 millimeters; wing, 18.5.

Frontal prolongation of head black, sparsely pruinose; nasus unusually elongate; palpi black. Antennæ black, the pedicel and apex of scape restrictedly brightened; scape elongate, exceeding in length the combined first and second flagellar segments; verticils subequal to the segments. Head gray.

Pronotum gray, with a median dark brown vitta. Mesonotal præscutum dark brownish gray, with four dark brown stripes, the intermediate pair separated throughout their length by a capillary line of the ground color; posterior sclerites of notum pruinose, the mediotergite clearer gray, with a capillary brown line. Pleura uniformly gray; dorsopleural region yellow. Halteres yellow, the knobs dark brown. Legs with the coxæ gray; trochanters brownish yellow; femora black, the extreme bases obscure yellow; a broad yellow subterminal ring on all femora, this subequal in width to the dark apex (forelegs) or much broader, about one-half wider than apex (hind legs); tibiæ brown to brownish black, paler at base, darker at tip; tarsi brownish black. Wings (Plate 1, fig. 14) whitish, variegated by grayish brown and dark brown areas; prearcular region and cells C and Sc uniformly pale; darker brown areas include the stigma and a major confluent area on anterior cord and on distal third of Rs; origin of Rs; bases of cells R and M; conspicuous seams along m-cu and distal section of Cu₁; darkened wing tip relatively narrow, including less than the distal half of cells R₂, R₃, or R₅; inner end of darkened apex about on a level with the fork of M₁₊₂; paler clouds in cells M, Cu, and 1st A; veins M₃ and 2d A narrowly seamed with dark brown; cell 2d A almost clear, its apical border narrowly darkened; veins brownish yellow, darker in the clouded areas. Venation: R₁₊₂ preserved on about its basal half; Rs elongate, exceeding vein R₃.

Abdomen black, sparsely pruinose, the lateral borders somewhat broadly pruinose. Ovipositor with the genital shield polished black; cerci long and slender, brownish black.

Habitat.—China (Szechwan).

Holotype, female, O-Er, 26 miles north of Li-Fan, altitude 10,800 feet, August 16, 1933 (*Graham*).

The yellow subterminal rings on the femora remind one strongly of the condition found in *Tipula (Oreomyza) latiflava* Alexander (Szechwan), but the wing pattern is quite distinct, notably the clear cells C and Sc and the relatively narrow dark-

ened wing tip. The long basal spur of vein R_{1+2} is different from that found in any of the members of the *mutila* group. The fly is even closer to two Burmese species, *T. (O.) latistriga* Edwards and *T. (O.) leucosticta* Edwards, but differs in the thoracic pattern and the wing coloration, notably the unusually wide white band beyond the cord and the virtually immaculate cell 2d A.

16. Subgenus LUNATIPULA Edwards

Tipula (Lunatipula) EDWARDS, Ann. & Mag. Nat. Hist. X 8 (1931) 81-82.

Type.—*Tipula lunata* Linnæus. (Western Palæarctic.)

Antennæ usually short, the verticils exceeding the segments in length. Frontal prolongation of head relatively long, with short to long nasus.

Mesopleura usually glabrous, in cases (including the subgenotype) with a few setæ on sternopleurite and meron. Tibial spur formula 1-2-2; claws (male) with basal tooth. Squama with a group of setæ, these usually abundant; veins beyond cord with trichia. Venation: R_{1+2} usually entire, in some species (as *manca*) more or less atrophied; R_s variable in length, ranging from subequal to m-cu to more than twice this length; vein R_3 straight or nearly so; R_{4+5} ending before wing tip.

Male hypopygium with tergite and sternite distinct. Tergite almost invariably with a median notch. Outer dististyle small to merely depressed-clavate. Eighth sternite usually provided with hair brushes, pencils, or fleshy lobes. Ovipositor with cerci long and slender, smooth-margined; more rarely (*fascipennis* and *marmoratipennis* groups) with cerci and hypoalvæ short and fleshy.

Lunatipula includes a certain proportion of the so-called "Subunicolores," species with the wings unmarked or virtually so and with the oblitative area at the cord forming a conspicuous pale lunule against the ground color. Some of the groups include species with heavily patterned wings.

As here classified, the subgenus divides into more or less natural groups, of which the following may be indicated:

1. *lunata* group, including *polypogon* and several others.
2. *fascipennis* or *bicornis* group, including *annulicornuta*, *pseudogyne*, *tateyamæ*, *turanensis*, and *validicornis*.
3. *marmoratipennis* group, including *holoteles*, *marmoratipennis*, *multibarbata*, *multisetosa*, *naviculifer*, and *shogun*.

4. *macrolabis* group, including *macrolabis*.
 5. *oreada* group, including *oreada*.

Species of the subgenus Lunatipula.

1. PALÆARCTIC EASTERN ASIA

<i>ampliata</i> Alexander.	<i>pendula</i> Alexander.
<i>annulicornuta</i> Alexander.	<i>plagiotoma</i> Alexander.
<i>flaccida</i> Alexander (probably).	<i>polypogon</i> Alexander.
<i>gondattii</i> Alexander.	<i>pseudogyne</i> Alexander.
<i>holoteles</i> Alexander.	<i>shogun</i> Alexander.
<i>lamentaria</i> Alexander.	<i>sublimitata</i> Alexander.
<i>macrolabis</i> Loew.	<i>tateyamæ</i> Alexander.
<i>manca</i> Alexander.	<i>terebrina</i> Alexander.
<i>multibarbata</i> Alexander.	<i>turanensis</i> Alexander.
<i>naviculifer</i> Alexander.	<i>validicornis</i> Alexander.

2. PALÆARCTIC CENTRAL ASIA

<i>absconsa</i> Alexander.	<i>subvernalis</i> Alexander (<i>fasciculata</i> Brunetti, preoccupied) (proba- bly occurs in 2).
<i>marmoratipennis</i> Brunetti.	
<i>minensis</i> Alexander.	<i>transfixa</i> Alexander.
<i>multisetosa</i> Alexander.	<i>trialbosignata</i> Alexander.
<i>nigrobasalis</i> Alexander.	<i>variipetiolearis</i> Alexander.
<i>oreada</i> Alexander.	

Genus PRIONOCERA Loew

Prionocera LOEW, Stettin. Ent. Zeitg. 5 (1844) 170.

Stygeropis LOEW, Berlin. Ent. Zeitschr. 7 (1863) 298.

PRIONOCERA LÆTIPENNIS sp. nov. Plate 1, fig. 15; Plate 3, fig. 42.

General coloration brownish gray, the præscutum with four slightly darker stripes; antennæ with flagellar segments strongly nodulose, with short apical pedicels, the basal segments yellow; wings strongly suffused with yellow, the costal portions more saturated; abdomen yellow, with a continuous black median stripe on the tergites.

Male.—Length, about 12 to 13 millimeters; wing, 12.5 to 13.5.

Female.—Length, 15 to 16 millimeters; wing, 16 to 16.5.

Frontal prolongation of head of moderate length, obscure yellow, darker beneath; nasus long and slender; basal segments of palpi dark brown, the outer two-thirds of terminal segment paling to yellow. Antennæ with basal three segments yellow, the succeeding segment dark in middle, pale at both ends; third flagellar segment dark basally, the apex a little brightened; remainder of flagellum black; first flagellar segment long and

slender, exceeding the scape and about equal in length to the next two flagellar segments taken together (Plate 3, fig. 41); flagellar segments short and crowded, the basal enlargement strongly produced beneath; subterminal segment with a more slender apical neck that is subequal in length to the enlarged basal portion; terminal segment slender, subequal in length and only a little thicker than the pedicel of the penultimate segment; flagellar segments clothed with short abundant erect setæ and with two apical verticils at extreme apex of outer case. Head chiefly dark brown, deepest just behind the antennal fossæ; posterior orbits a little brighter; a capillary dark brown median vitta.

Mesonotal præscutum brown with four scarcely darker brown stripes, the intermediate pair separated by a capillary dark brown vitta; scutal lobes brownish gray; posterior sclerites of notum brownish yellow, sparsely pruinose. Pleura almost uniformly grayish white pruinose, the sternopleurite and ventral meron darker gray, the pteropleurite and pleurotergite clearer yellow. Halteres brownish yellow, the knobs darkened. Legs with the coxæ grayish white; trochanters yellow; femora yellow, the tips narrowly blackened; tibiæ brownish yellow, the tips narrowly darkened; tarsi yellowish brown, passing into black. Wings (Plate 1, fig. 15) strongly suffused with yellow; cell Sc clearer yellow, cell C a trifle more brownish yellow; stigma darker brown; cephalic portion of cells R and R₁ more suffused with pale brown; vague pale central streaks in cells M and 1st A; veins yellow to brownish yellow. Veins with sparse trichia, including a series on basal half of R₃ and a sparse scattered series on outer two-thirds of R₄₊₅; M, Cu, and anal veins glabrous. Venation: Rs subequal to R₃.

Abdominal tergites yellow, with a very conspicuous, continuous, black, median stripe that is narrow on the basal tergite, widening slightly behind, at widest point about equal to the pale lateral margins; sternites reddish yellow, the seventh to ninth segments more darkened. Male hypopygium with the tergite (Plate 3, fig. 42, 9t) transverse, the posterior border blackened, each outer lateral angle terminating in a small black tooth. Outer dististyle, *od*, flattened, on inner margin before apex with a tumid, setiferous lobe. Inner style, *id*, with apical beak elongate. Ovipositor with cerci relatively short, the tips obtuse, the basal portions relatively wide; surface fleshy, with microscopic yellow setulæ.

Habitat.—China (Szechwan).

Holotype, male, Mupin, altitude 3,500 feet, June, 1929 (*Graham*). Allotopotype, female. Paratopotypes, 3 males and females. Paratypes, 1 male, Kwanhsien, May 28, 1930 (*Graham*); 1 female, Chengtu, altitude 1,700 feet, July 13 to 15, 1933 (*Graham*).

Prionocera lætipennis is readily told from *P. indica* Edwards (India, Assam, and French Indo-China) and *P. altivolans* sp. nov. (China-Tibet border) by the conspicuously brightened wings, which are strongly suffused with yellow, instead of the usual grayish tinge. The genus has not been recorded from China.

PRIONOCERA ALTIVOLANS sp. nov. Plate 1, fig. 16.

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

Allied to *lætipennis* sp. nov., yet obviously distinct. The chief differences are as follows: Entire head, including the frontal prolongation, dark brown, the latter a trifle paler on sides. Antennæ brownish black throughout, including both scape and pedicel. Posterior parts of head variegated with silvery gray on orbits. Mesonotal præscutum with the dorsum almost uniformly dark brown, the stripes a little darker than the interspaces; capillary dark median vitta well indicated on cephalic half of sclerite; a dusky spot in humeral region, cephalad of the lateral stripes; posterior sclerites of notum much darker than in *lætipennis*; mediotergite clear gray. Legs with the femoral tips more broadly blackened. Wings (Plate 1, fig. 16) with the prearcular and subcostal fields, together with the narrow cell Cu_1 , clear yellow, the remainder of wing more gray. Trichia on veins R_3 and R_{4+5} very sparse, especially reduced on the latter vein. Venation: Rs somewhat shorter and more arcuated. Abdomen with tergites chiefly dark brown, the lateral borders narrowly more yellowish; sternites dark. Ovipositor with cerci narrower on basal portion.

Habitat.—China (Szechwan-Tibet border).

Holotype, female, near Tang-Gu, altitude 14,000 feet, August 3 to 6, 1930 (*Graham*). Paratopotype, female.

Genus NEPHROTOMA Meigen

Nephrotoma MEIGEN, Illiger's Mag. 2 (1803) 262.

Pachyrrhina MACQUART, Suit. a Buffon 1 (1834) 88.

NEPHROTOMA RETENTA sp. nov. Plate 1, fig. 17; Plate 4, fig. 43.

Antennal flagellum black; occipital band black, its anterior end obtuse; margins of pronotal scutellum blackened; præscutal

stripes polished black, very narrowly margined with velvety black; scutellum brownish yellow; mediotergite yellow, with two more reddish yellow areas at posterior border; pleura yellow, variegated with reddish; fore femora extensively blackened; wings almost uniformly suffused with pale brownish yellow, the stigma scarcely darker; Sc_2 extending distinctly beyond origin of R_s , Sc_1 preserved; R_s long; abdominal tergites trivittate with black.

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

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

Frontal prolongation of head light yellow, narrowly blackened dorsally; nasus long and conspicuous, black; palpi black throughout. Antennæ with scape yellow; pedicel brownish yellow; base of first flagellar segment obscure yellow, the color continued up the lower face; remainder of flagellum black; flagellar segments relatively long and slender, slightly exceeding the longest verticils, only moderately incised; terminal segment small, subequal in length to the basal enlargement of the penultimate segment. Head orange, the summit of the vertical tubercle more yellowish; occipital brand black, conspicuous, subtriangular, its anterior end broadly obtuse, not surpassing the posterior vertex.

Pronotum yellow, the margins of the scutellum and propleura narrowly lined with black. Mesonotal præscutum yellow, with three shiny black stripes that are very narrowly bordered by velvety black; lateral stripes straight, but with a weak, somewhat paler area at their anterior ends giving the appearance of being outcurved; scutum light yellow, the lobes variegated with two confluent black areas; outer end of suture, laterad of the outer dark markings, narrowly bordered by black, in the female more extensively darkened; scutellum brownish yellow; mediotergite pale yellow, the posterior border with two more reddish yellow areas. Pleura yellow, more reddish on anepisternum, ventral sternopleurite, and ventral meron; posterior border of ventral pleurotergite narrowly darkened. Halteres pale brown, the knobs weakly darkened. Legs with the coxæ orange-yellow; trochanters obscure yellow; femora yellow, the tips blackened, more extensively so on the fore pair where about the distal half is darkened, much narrower on the posterior legs; tibiæ yellowish brown, the tips broadly blackened; tarsi black. Wings (Plate 1, fig. 17) almost uniformly suffused with pale brownish yellow, the prearcular region and cells C and Sc a trifle clearer

yellow; stigma very pale, scarcely darker than the ground; veins dark brown. Venation: Sc_2 extending distinctly beyond origin of R_s , Sc_1 preserved; R_s unusually long, subequal to R_{2+3} ; cell M_1 rather broadly sessile; m-cu just before fork of vein M_4 .

Abdomen yellow, the tergites trivittate with black, the median stripe in female unusually broad; sternites yellow, weakly darkened medially. Male hypopygium with the tergite (Plate 4, fig. 43, 9t) produced into acute spinous points on either side beneath the dorsal surface. Outer dististyle, *od*, long-attenuate. Inner dististyle, *id*, simple. Eighth sternite deeply emarginate, without lobes of any kind, the setal fringe moderately long and dense.

Habitat.—China (Szechwan-Tibet border).

Holotype, male, near Yien-Long-Shien, altitude 13,000 to 15,000 feet, August 3 to 6, 1930 (*Graham*). Allotype, female, Yin-Kuan-Tsai, altitude from 13,000 to 15,000 feet, July 25, 1930 (*Graham*).

The present fly is quite distinct from other previously described regional species in the diagnostic features listed, notably the immaculate wings with somewhat peculiar venation. It is more nearly allied to other species described at this time.

NEPHROTOMA ATTENUATA sp. nov. Plate 1, fig. 18; Plate 4, fig. 44.

Antennæ black, only the scape brightened above in certain cases; occipital brand black, sending an anterior prolongation almost to summit of vertical tubercle; præscutal stripes three, black, narrowly bordered by opaque velvety black; scutellum darkened; mediotergite yellow, with a pale brown median vitta; wings almost uniformly brownish yellow, the stigma a trifle darker; Sc_2 ending opposite origin of R_s ; cell M_1 sessile; abdominal tergites trivittate with brownish black; male hypopygium with outer dististyle greatly attenuated.

Male.—Length, about 10 millimeters; wing, 11 to 11.5.

Frontal prolongation of head yellow, broadly dark brown above; palpi black throughout. Antennæ of moderate length, in male, if bent backward, extending to some distance beyond base of abdomen; in type specimen, black throughout; in paratypes, with the scape restrictedly yellow on upper face; flagellar segments very weakly incised. Head orange-yellow, the front light sulphur yellow; occipital brand very conspicuous, black, sending an anterior prolongation almost to summit of vertical

tubercle; a small black spot adjoining eyes behind each antennal fossa.

Pronotum light yellow, the scutellum very restrictedly darkened medially, more extensively so on sides. Mesonotal præscutum with three subnitidous black stripes that are narrowly bordered by opaque velvety black, the lateral stripes straight or with only a slight extension laterad of the velvety-black anterior ends; median stripe reaching the suture behind; scutum yellow, each lobe with two confluent subnitidous areas that are narrowly bordered by velvety black; scutellum weakly to strongly darkened, the parascutella darkened; mediotergite yellow, with a median pale brown line, the posterior border slightly more reddish. Pleura yellow, the anepisternum and ventral sternopleurite and meron more reddish; linear black dashes on posterior border of sternopleurite and anepisternum, ventral edge of pleurotergite, and posterior portion of lateral pretergites. Halteres dusky, the knobs more or less brightened. Legs with the coxæ and trochanters yellow; femora obscure yellow, the tips passing into black, broadest on the forelegs; tibiæ brown basally, passing into black; tarsi black. Wings (Plate 1, fig. 18) with a strong brownish yellow tinge, the stigma a trifle darker brown; veins dark brown to brownish black. Venation: Sc_2 ending opposite origin of the short Rs, Sc_1 lacking or preserved only as a basal spur; cell M_1 sessile; m-cu just before fork of M_4 .

Abdominal tergites orange-yellow, narrowly trivittate with brownish black, the areas narrowly interrupted at the incisures; sternites yellow, unmarked. Male hypopygium with the outer dististyle (Plate 4, fig. 44, *od*) exceedingly produced and attenuated. Inner dististyle, *id*, with the beak slender, the outer portion elevated into a pale membranous crest that is produced caudad into a long tail-like portion. Ninth sternite just before the caudal margin of the eighth sternite with a small, pale, fingerlike lobe, directed ventrad and slightly cephalad. Eighth sternite with the caudal margin nearly transverse, not emarginate, but with the whole posterior third of the sclerite pale, with white membrane, on either side of which the setæ are longer and more aggregated.

Habitat.—China (Szechwan-Tibet border).

Holotype, male, near Yien-Long-Shien, altitude 13,000 to 15,000 feet, August 3 to 6, 1930 (*Graham*). Paratopotypes, 2 males.

The present fly is most generally similar to *Nephrotoma retenta* sp. nov., agreeing in the general coloration of the body and wings. It is very different in the details of coloration and venation, and especially in the structure of the male hypopygium.

NEPHROTOMA IMPIGRA sp. nov. Plate 1, fig. 19; Plate 4, fig. 45.

General coloration yellow; præscutum with three polished black stripes; scutellum brownish black or black; mediotergite darkened in central portion; antennæ (male) relatively long, if bent backward extending about to the base of abdomen; flagellum black; wings whitish subhyaline, cell Sc uniformly darkened; M_4 and m-cu both at or close to proximal end of cell 1st M_2 ; abdominal tergites yellow, with a median, brownish black stripe, narrowly interrupted at posterior borders of segments, the lateral stripes lacking; male hypopygium with lateral portions of tergite produced caudad into slender, straight, spike-like horns.

Male.—Length, 8.5 to 9 millimeters; wing, 9.5 to 10.

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

Frontal prolongation of head yellow, darker above, including the nasus; palpi brownish black, the outer segment somewhat paler. Antennæ in male relatively long, if bent backward extending about to base of abdomen; scape light yellow; pedicel obscure yellow; flagellum black; flagellar segments moderately incised, the verticils much shorter than the segments. Head orange-yellow; occipital brand brown, conspicuous, sending a median spurlike point to the base of vertical tubercle; orbital darkening barely indicated.

Pronotum broadly yellow medially, dark brown on sides. Mesonotal præscutum yellow, with three polished black stripes, the lateral pair usually with a faint brownish cloud opposite their outer cephalic end; scutum yellow, the lobes chiefly covered by polished black areas; scutellum brownish black to black, the parascutella yellow; mediotergite yellow, narrowly dark brown medially, the posterior border with two contiguous circular black areas. Pleura yellow, with reddish areas on anepisternum, ventral sternopleurite, ventral meron and on pleurotergite, the latter area encircling the ventral pleurotergal area. Halteres with stem brownish yellow, the base of knob darkened, the apex again brightened. Legs with the coxæ and trochanters yellow; femora chiefly dark brown, the bases restrictedly yellow; tibiæ brown, the tips passing into dark brown; tarsi brownish black. Wings

(Plate 1, fig. 19) whitish subhyaline; cell Sc uniformly darkened; stigma brown, moderately conspicuous; veins brownish black. Venation: Sc₁ present as a spur; Rs pale, subequal to basal section of R₄₊₅; cell M₁ petiolate; M₄ departing at fork of M, with m-cu at this same point, and so close to base of cell 1st M₂, in cases a little beyond the base, as in *distans*.

Abdominal tergites yellow, with a median brownish black stripe, narrowly interrupted at the posterior borders of the segments; lateral stripes quite lacking; on sixth and seventh segments the black color more extensive; sternites uniformly pale, the seventh and eighth more or less blackened; hypopygium pale. Male hypopygium with the ninth tergite (Plate 4, fig. 45, 9t) on either side projected into slender, straight, spikelike horns, each with a series of six or seven blackened points along their mesal edge; more mesally, the caudal margin of tergite is densely set with blackened points that are directed away from the median line. Dististyles, *od*, *id*, as figured. Eighth sternite with caudal border transverse, unarmed, the median region at and back from the margin with long abundant yellow setæ.

Habitat.—China (Szechwan).

Holotype, male, Mount Omei, altitude 4,500 feet, August 10, 1929 (*Franck*). Allotopotype, female, pinned with type. Paratopotypes, 8 males and females, August 10 to 15, 1929 (*Franck*). Paratype, 1 male, Beh-Luh-Din, altitude 6,000 feet, August 23 to 24, 1933 (*Graham*).

The nearest ally is the species next described as *Nepthrotoma pilata* sp. nov., which differs especially in the details of coloration and structure of the male hypopygium.

NEPHROTOMA PILATA sp. nov. Plate 1, fig. 20; Plate 4, fig. 46.

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

Generally similar and closely allied to *N. impigra* sp. nov., differing as follows:

Frontal prolongation of head entirely pale yellow, including the nasus, the vestiture light golden yellow. Occipital band greatly reduced and poorly delimited, appearing only as an irregular brown suffusion; orbital darkenings small but evident. Præscutal stripes highly polished, very narrowly margined by velvety black; lateral stripes straight; central darkening of mediotergite extensive. Wings (Plate 1, fig. 20) a trifle more suffused with dusky. Venation: Cell M₁ very short-petiolate to nearly sessile. Darkenings on abdominal tergites more exten-

sive. Male hypopygium with the lateral spines of the tergite (Plate 4, fig. 46, 9*t*) broad-based, the tips obliquely truncated; groups of spines on caudal border of tergite more compact, subglobular in outline. Dististyles, *od*, *id*, as shown; inner style very deep. Eighth sternite nearly transverse across caudal margin, at midline of posterior edge with a small compressed lobe, directed ventrad, truncated at apex; surface of sternite behind this lobe with long, conspicuous, yellow setæ.

Habitat.—China (Szechwan).

Holotype, male, Chengtu, altitude 1,700 feet, April 11 to 14, 1933 (*Graham*).

NEPHROTOMA IMMÉMORATA sp. nov. Plate 1, fig. 21; Plate 4, fig. 47.

General coloration yellow, the præscutum with three polished black stripes, the lateral pair outcurved; occipital brand scarcely evident; prothorax entirely pale yellow; mediotergite yellow, darkened only on posterior border; knobs of halteres pale yellow; wings with a very faint brown tinge, the cord and extreme wing tip darkened; cell M_1 short-petiolate; abdomen yellow, the tergites with an interrupted series of median spots; hypopygium pale; eighth sternite with a long, pale, compressed, median blade; outer dististyle attenuated.

Male.—Length, about 9 millimeters; wing, 9.6.

Frontal prolongation of head yellow, only weakly darkened above; nasus elongate, reddish brown, tufted with long black setæ; palpi dark brown. Antennæ with scape light yellow, pedicel and flagellum dark brown; antenna moderately elongate, if bent backward extending to shortly beyond base of abdomen; flagellar segments moderately incised, the verticils shorter than the segments. Head yellow, the vertical tubercle clearer yellow; no sign of orbital darkening; occipital brand very small, scarcely apparent against the ground color.

Pronotum and propleura entirely pale yellow. Mesonotum pale yellow, the præscutum with three polished black stripes, the lateral pair strongly outcurved, almost reaching the lateral margin; scutum pale yellow, the lobes extensively variegated with black, the color broadly confluent across the suture with the lateral præscutal stripes; scutellum brownish black, the parascutella light yellow; mediotergite entirely pale yellow, unmarked except for the usual paired darkened spots at posterior border. Pleura pale yellow, variegated with more reddish on the anepisternum, the ventral sternopleurite, and as a semicircular area on the pleurotergite. Halteres dusky, the apices of the knobs

pale yellow. Legs with the coxæ and trochanters yellow; femora and tibiæ brownish yellow, the tips not or only very narrowly darkened; tarsi black. Wings (Plate 1, fig. 21) relatively narrow, with a very faint brown tinge; stigma oval, relatively dark brown; very narrow dark clouds on anterior cord and m-cu; wing tip very narrowly darkened; veins dark brown. Venation: Sc_1 barely indicated; Sc_2 ending just before origin of Rs, the latter subequal to R_{2+3} ; cell M_1 short-petiolate; M_4 arising some distance before departure of vein M_3 ; m-cu a short distance before fork of M.

Abdomen yellow, the tergites with an interrupted median stripe, appearing as broad, dark brown, posterior triangles, on the outer segments small and inconspicuous; tergites very vaguely darkened on lateral portion; sternites and hypopygium pale. Male hypopygium with the tergite (Plate 4, fig. 47, 9t) extended into a slender, gently curved arm on either side, each bearing a tooth at near midlength of mesal face and a group of four or five others at base; intermediate spinous lobes of tergite truncated at tips, lying close together. Outer dististyle, *od*, long-attenuate, the base relatively broad. Inner dististyle, *id*, bidentate at apex of beak, one point being blackened, the other pale. Membrane between eighth and ninth sternites produced ventrad and slightly cephalad into a long, pale, compressed lobe, narrowed to the tip, the surface microscopically setulose; upon dissection, this blade is seen to be a part of the eighth sternite and is removed with it.

Habitat.—China (Szechwan).

Holotype, male, Mount Omei, August 22, 1929 (*Franck*).

The present species is very distinct in the details of coloration and structure of the male hypopygium, notably the long-attenuated outer dististyles and the pale median lobe of the eighth sternite. The structure of the hypopygium is somewhat as in the otherwise very different *Nephrotoma ligulata* Alexander (Mongolia).

NEPHROTOMA DECREPITA sp. nov. Plate 1, fig. 22; Plate 4, fig. 48.

General coloration yellow; præscutal stripes black, the surface weakly pitted to appear only feebly shining; occipital band dark brown, poorly delimited; terminal segment of maxillary palpus orange-yellow; central portion of mediotergite darkened; legs and halteres chiefly yellow; wings subhyaline, stigma pale brown, cell Sc light yellow; abdomen orange, the tergites with

an interrupted median series of brown spots; hypopygium pale; ninth sternite with two ventral lobes.

Male.—Length, about 11 millimeters; wing, 10.

Frontal prolongation of head obscure yellow, the dorsal surface weakly infumed; nasus a little darker; palpi with basal three segments chiefly brown, the terminal segment paling to orange-yellow. Antennæ moderately elongate, if bent backward extending to shortly beyond the base of abdomen; scape and pedicel yellow, flagellum black; flagellar segments moderately incised; verticils shorter than the segments. Head yellow, the occipital brand dark brown, of moderate size, poorly delimited especially at anterior end; orbital spots barely evident.

Pronotum clear yellow, the lateral portions infuscated. Mesonotal præscutum yellow, with three black stripes, the surface weakly pitted and thus only feebly shining; stripes very narrowly bordered by more velvety black; a paler brown spot at anterior end of lateral stripe; scutum yellow, the lobes extensively blackened; lateral end of suture and outer corner of scutal lobe darkened; scutellum blackened, parascutella yellow; mediotergite light yellow, with a broad, median, brown area, more expanded at posterior border. Pleura yellow, variegated with more reddish yellow on anepisternum, ventral sternopleurite, and ventral meron; dorsal pleurotergite reddish, the lower edge of the ventral pleurotergite narrowly dark brown. Halteres almost uniformly yellow throughout. Legs with the coxæ and trochanters yellow; femora and tibiæ obscure yellow, the tips not or scarcely darkened; basitarsi yellowish brown, passing into brownish black; remainder of tarsi black. Wings (Plate 1, fig. 22) subhyaline; stigma pale brown; cell Sc and prearcular field light yellow; veins brown. Venation: Sc₁ lacking; cell M₁ sessile; M₄ departing some distance before base of cell 1st M₂; m-cu on M₄ shortly beyond origin.

Abdominal tergites orange, with a broken series of brown spots, interrupted at the incisures; sternites and hypopygium pale, the eighth sternite darkened subbasally. Male hypopygium with the tergite (Plate 4, fig. 48, 9t) produced into two strongly divergent horns, at base of their mesal face with four or five blackened points; mesal lobes unusually slender, with abundant black spicules. Outer dististyle relatively small and slender, the tip not long-produced. Inner dististyle, *id*, with apical beak slender. Ninth sternite produced ventrad into a stout, fleshy, pale lobe; extreme posterior border of sternite with a median

ligulate darkened lobe that in a position of rest lies cephalad along the surface of the eighth sternite. This appendage appears to arise from the membrane between the eighth and ninth sternites but upon dissection actually comes from the posterior border of the ninth.

Habitat.—China (Szechwan).

Holotype, male, Mount Omei, altitude 4,500 feet, August 15, 1929 (*Franck*).

As is usual in the genus, the chief characters for defining the present fly lie in the details of structure of the male hypopygium, especially the ninth tergite, the inner dististyle, and the peculiar lobes of the ninth sternite, the last being quite different from that of regional species.

NEPHROTOMA BIFORMIS sp. nov. Plate 1, fig. 23; Plate 4, fig. 49.

Sexes strongly dimorphic in color; males chiefly black, variegated with yellow; abdomen blackened, without reddish color; femora yellow basally, with approximately the outer half blackened; wings beyond base with a faint yellow tinge; females with only the extreme tips of femora blackened; wings uniformly and deeply tinged with amber yellow; abdomen extensively brick red; male hypopygium with a bidentate plate on caudal margin of eighth sternite.

Male.—Length, 13 to 14 millimeters; wing, 11 to 12.

Female.—Length, 15 to 17 millimeters; wing, 12 to 13.

Male.—Rostrum entirely black, including nasus and palpi. Antennæ black throughout, relatively short, if bent backward extending to about midway between the roots of the wings and halteres; flagellar segments scarcely incised; longest verticils shorter than the segments. Front deep yellow, the anterior vertex orange, the entire posterior vertex and occiput black, the occipital band more opaque, the remainder of the darkened area more velvety; a black spot on anterior orbits opposite the narrowest point; in cases, a yellow area on posterior gena beneath eye.

Pronotum black, broadly yellow medially. Mesonotal præscutum black, the stripes more glabrous, the interspaces deep velvety black; a large, nearly circular yellow area on humerus; lateral border before suture obscure yellow; scutum black, the median portion narrowly pale yellow; scutellum and mediotergite black, the latter restrictedly obscure yellow on sides. Pleura black, variegated with yellow on the pleurotergite and very obscurely on the anepisternum and pteropleurite. Halteres

dusky, the knobs black. Legs with the coxæ dull black, pruinose; trochanters obscure yellow; femora yellow basally, with approximately the outer half or less black; tibiæ brown basally, passing into black; tarsi black. Wings (Plate 1, fig. 23) with a faint yellow tinge; stigma oval, dark brown; prearcular region and cells Sc and Cu₁ light yellow; a restricted dark seam on anterior cord; extreme wing tip very insensibly darkened; veins black, more flavous in the yellow areas. Venation: Sc₂ ending opposite or just beyond origin of the short Rs; cell M₁ sessile; M₄ variable in position, usually departing some distance before M₃, but in cases at this point; m-cu at or a short distance before the fork of M₄.

Abdomen almost entirely blackened; pruinose, without reddish coloration; extreme lateral borders of tergites and caudal margins of sternites pale yellow; hypopygium black. Male hypopygium with the tergite (Plate 4, fig. 49, 9t) produced into two flattened lobes that are separated by a narrow notch, the mesal edges of the lobes with slender spines and stout spinous setæ. Outer dististyle, *od*, relatively narrow, not greatly attenuated. Inner dististyle, *id*, with the margin having a series of more than a score of long erect setæ, the shorter ones more distad. Eighth sternite tranverse, the caudal margin beneath with a depressed lobe, 8s, that terminates in two acute black lateral spines, separated by a U-shaped emargination.

Female.—Like the male, differing as follows: Antennal scape yellow to obscure yellow. Femora and tibiæ yellow, the tips narrowly blackened. Wings strongly suffused with amber yellow, much deeper in color than in male. Abdomen chiefly brick red, the tergites velvety black medially, with very broad lateral margins of the ground color, the sixth and succeeding segments almost uniformly reddish; basal tergite uniformly blackened, pruinose; the remaining tergites with pruinose lateral margins; sternites red, the lateral borders narrowly black.

Habitat.—China (Szechwan).

Holotype, male, O-Er, 26 miles north of Li-Fan, altitude 9,000 feet, August 6 to 16, 1933 (*Graham*). Allotopotype, female, August 17, 1933. Paratopotypes, 4 males, 8 females, August 6 to 18, 1933. Paratypes, 1 female, near Tang-Gu, altitude 14,000 feet, August 3 to 6, 1930 (*Graham*); 1 male, Mu-Sang-Tsai, altitude 8,000 to 10,000 feet, July 27 to 28, 1933 (*Graham*).

The only other regional species with which the present fly may be confused is *Nephrotoma erebus* Alexander (Mongolia), which

has the black coloration even more extensive, including the whole head, and with the hypopygial structure different.

NEPHROTOMA OMEIANA sp. nov. Plate 1, fig. 24; Plate 4, fig. 50.

Allied to *palloris*; antennæ (male) relatively elongate, the flagellar segments weakly bicolorous; occipital brand small and inconspicuous; mesonotal præscutum with three brown stripes; lateral ends of suture velvety black; scutellum and central portion of mediotergite broadly pale; tips of femora narrowly blackened; wings cream-colored, variegated with brown; a conspicuous pale area beyond the stigma; m-cu far before fork of M_4 ; abdominal tergites trivittate with brownish black, the stripes interrupted; male hypopygium with the outer dististyle small, not attenuated.

Male.—Length, 12.5 to 13.5 millimeters; wing, 10.5 to 11.5; antenna, 5 to 5.2.

Female.—Length, 17 to 18 millimeters; wing, 13 to 14.

Frontal prolongation of head obscure yellow, polished; nasus long-tufted, somewhat darker; palpi dark brown, the central portion of the terminal segment more yellowish. Antennæ (male) relatively elongate, as shown by the measurements; basal three segments yellow; succeeding flagellar segments bicolorous, brownish black, the outer ends of the segments narrowly yellow, the basal enlargements a little more intensely black; outer segments more uniformly darkened; flagellar segments rather strongly incised; terminal segment small, thimble-shaped. Head orange; occipital brand small, pale brown, inconspicuous.

Pronotum obscure yellow, a little darker on sides. Mesonotal præscutum yellow, with three brown stripes, their surface subnitidous, without darker margins; lateral stripes straight; scutum broadly yellow medially, the lobes entirely black; lateral ends of suture and extreme anterolateral corners of scutal lobes narrowly velvety black, forming a strongly curved mark; scutellum pale, parascutalla dark; mediotergite broadly pale yellow medially, darker laterally and behind. Pleura pale yellow, darker, more reddish, on the anepisternum and sternopleurite, forming an oblique or transverse girdle across mesopleura. Halteres yellow, the knobs weakly infuscated. Legs with the coxæ obscure yellow; trochanters yellow; femora yellow, the tips very narrowly but conspicuously blackened; tibiæ yellowish brown, brighter basally, the tips darkened; tarsi passing through brown to black. Wings (Plate 1, fig. 24) with the ground pale cream colored; prearcular region darkened; cell Sc

dark brown, C more brownish yellow; stigma oval, dark brown; wing tip broadly and conspicuously darkened, the color extending from cell R_2 to cell M_3 , separated from the dark stigmal area by a pale marking in cells Sc_2 and R_2 ; anterior cord and m-cu conspicuously seamed with brown; distal section of Cu_1 less conspicuously seamed with brown; veins dark brown. Venation: Sc_2 ending opposite the short Rs, Sc_1 represented by a short spur; cell M_1 petiolate; cell 1st M_2 relatively small; m-cu some distance before fork of M_4 .

Abdomen (male) elongate, yellow, the tergites narrowly trivittate with brownish black, the median stripe interrupted basally, the lateral stripes subbasally, on each segment; sternites yellow, narrowly darkened medially, more extensively so on the outer segments, the incisures pale; hypopygium yellow. Male hypopygium relatively large; tergite (Plate 4, fig. 50, 9t) proportionately small, gradually narrowed outwardly, with blackened spiculate points on either side of a deep U-shaped median notch but without other armature. Outer dististyle, *od*, small, triangular in outline, the tip not produced. Inner dististyle, *id*, as figured. Eighth sternite narrowly but rather deeply notched, with moderately conspicuous dark brown setæ surrounding the notch, their tips converging.

Habitat.—China (Szechwan).

Holotype, male, Mount Omei, altitude 4,500 feet, August 14, 1929 (*Franck*). Allotype, female, Chunking, altitude 1,000 to 2,000 feet, May 6 to 27, 1930 (*Graham*). Paratopotype, male, August 10, 1929 (*Franck*). Paratypes, 8 males and females, with the allotype; 2 males, 1 female, Kwanhsien, May 8 to 28, 1930 (*Graham*).

The nearest allies of the present fly are *Nephrotoma palloris* (Coquillett) and *N. sinensis* (Edwards), both of which have the postnotal mediotergite broadly pale, except laterally. The present fly differs most evidently in the three præscutal stripes, pale costal spot beyond the stigma, and the details of structure of the antennæ and male hypopygium.

ILLUSTRATIONS

[Legend: *b*, Basistyle; *d*, dististyle; *g*, gonapophysis; *id*, inner dististyle; *od*, outer dististyle; *s*, sternite; *t*, tergite.]

PLATE 1

- FIG. 1. *Tipula* (*Brithura*) *argyrospila* sp. nov., venation.
2. *Tipula* (*Brithura*) *fracticosta* sp. nov., venation.
3. *Tipula* (*Nippotipula*) *sinica* sp. nov., venation.
4. *Tipula* (*Sinotipula*) *exquisita* sp. nov., venation.
5. *Tipula* (*Sinotipula*) *gloriosa* sp. nov., venation.
6. *Tipula* (*Formotipula*) *omeicola* sp. nov., venation.
7. *Tipula* (*Formotipula*) *friedrichi* sp. nov., venation.
8. *Tipula* (*Acutipula*) *melampodia* sp. nov., venation.
9. *Tipula* (*Acutipula*) *bistyligera* sp. nov., venation.
10. *Tipula* (*Vestiplex*) *testata* sp. nov., venation.
11. *Tipula* (*Oreomyza*) *famula* sp. nov., venation.
12. *Tipula* (*Oreomyza*) *tetramelania* sp. nov., venation.
13. *Tipula* (*Oreomyza*) *rudis* sp. nov., venation.
14. *Tipula* (*Oreomyza*) *haplorhabda* sp. nov., venation.
15. *Prionocera* *laetipennis* sp. nov., venation.
16. *Prionocera* *altivolans* sp. nov., venation.
17. *Nephrotoma* *retenta* sp. nov., venation.
18. *Nephrotoma* *attenuata* sp. nov., venation.
19. *Nephrotoma* *impigra* sp. nov., venation.
20. *Nephrotoma* *pilata* sp. nov., venation.
21. *Nephrotoma* *immemorata* sp. nov., venation.
22. *Nephrotoma* *decrepita* sp. nov., venation.
23. *Nephrotoma* *biformis* sp. nov., venation.
24. *Nephrotoma* *omeiana* sp. nov., venation.

PLATE 2

- FIG. 25. *Tipula* (*Brithura*) *fracticosta* sp. nov., male hypopygium, details.
26. *Tipula* (*Brithura*) *fractistigma* Alexander, male hypopygium, dististyle.
27. *Tipula* (*Nippotipula*) *sinica* sp. nov., male hypopygium, details.
28. *Tipula* (*Sinotipula*) *exquisita* sp. nov., male hypopygium, details.
29. *Tipula* (*Sinotipula*) *gloriosa* sp. nov., male hypopygium, details.
30. *Tipula* (*Sinotipula*) *gloriosa* sp. nov., male hypopygium, dististyles.
31. *Tipula* (*Sinotipula*) *persplendens* sp. nov., male hypopygium, dististyles.
32. *Tipula* (*Formotipula*) *friedrichi* sp. nov., male hypopygium, details.
33. *Tipula* (*Acutipula*) *melampodia* sp. nov., male hypopygium, ninth tergite.
34. *Tipula* (*Acutipula*) *melampodia* sp. nov., male hypopygium, details.

PLATE 3

- FIG. 35. *Tipula* (*Acutipula*) *bistyligera* sp. nov., male hypopygium, details.
36. *Tipula* (*Vestiplex*) *testata* sp. nov., male hypopygium, details.
37. *Tipula* (*Oreomyza*) *famula* sp. nov., male hypopygium, details.
38. *Tipula* (*Oreomyza*) *tetramelania* sp. nov., male hypopygium, details.
39. *Tipula* (*Oreomyza*) *rudis* sp. nov., male hypopygium, details.
40. *Tipula* (*Oreomyza*) *rudis* sp. nov., male hypopygium, details.
41. *Prionocera* *lætippennis* sp. nov., antenna, male; basal six segments.
42. *Prionocera* *lætippennis* sp. nov., male hypopygium, details.

PLATE 4

- FIG. 43. *Nephrotoma* *retenta* sp. nov., male hypopygium, details.
44. *Nephrotoma* *attenuata* sp. nov., male hypopygium, details.
45. *Nephrotoma* *impigra* sp. nov., male hypopygium, details.
46. *Nephrotoma* *pilata* sp. nov., male hypopygium, details.
47. *Nephrotoma* *immemorata* sp. nov., male hypopygium, details.
48. *Nephrotoma* *decrepita* sp. nov., male hypopygium, details.
49. *Nephrotoma* *biformis* sp. nov., male hypopygium, details.
50. *Nephrotoma* *omeiana* sp. nov., male hypopygium, details.

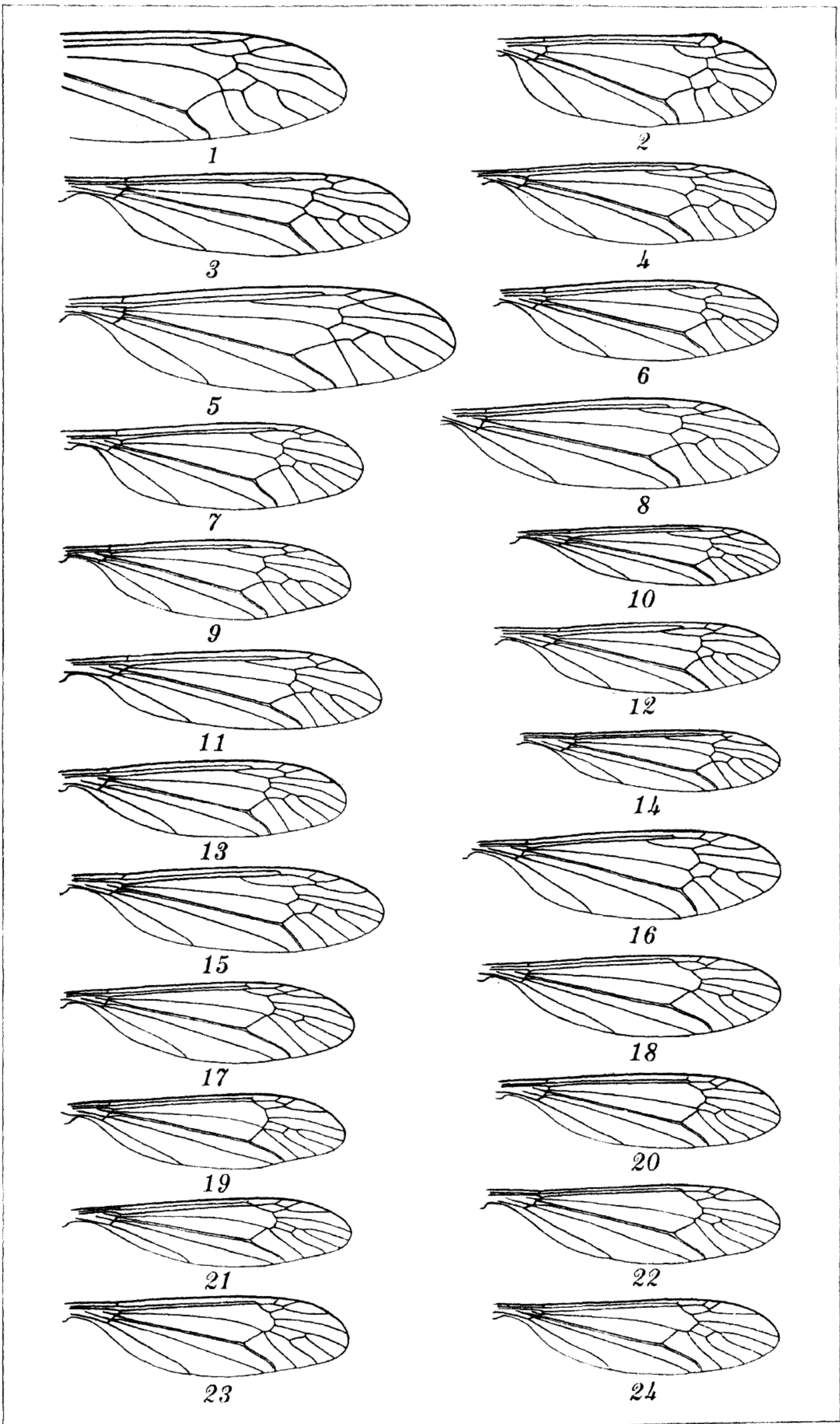


PLATE 1.

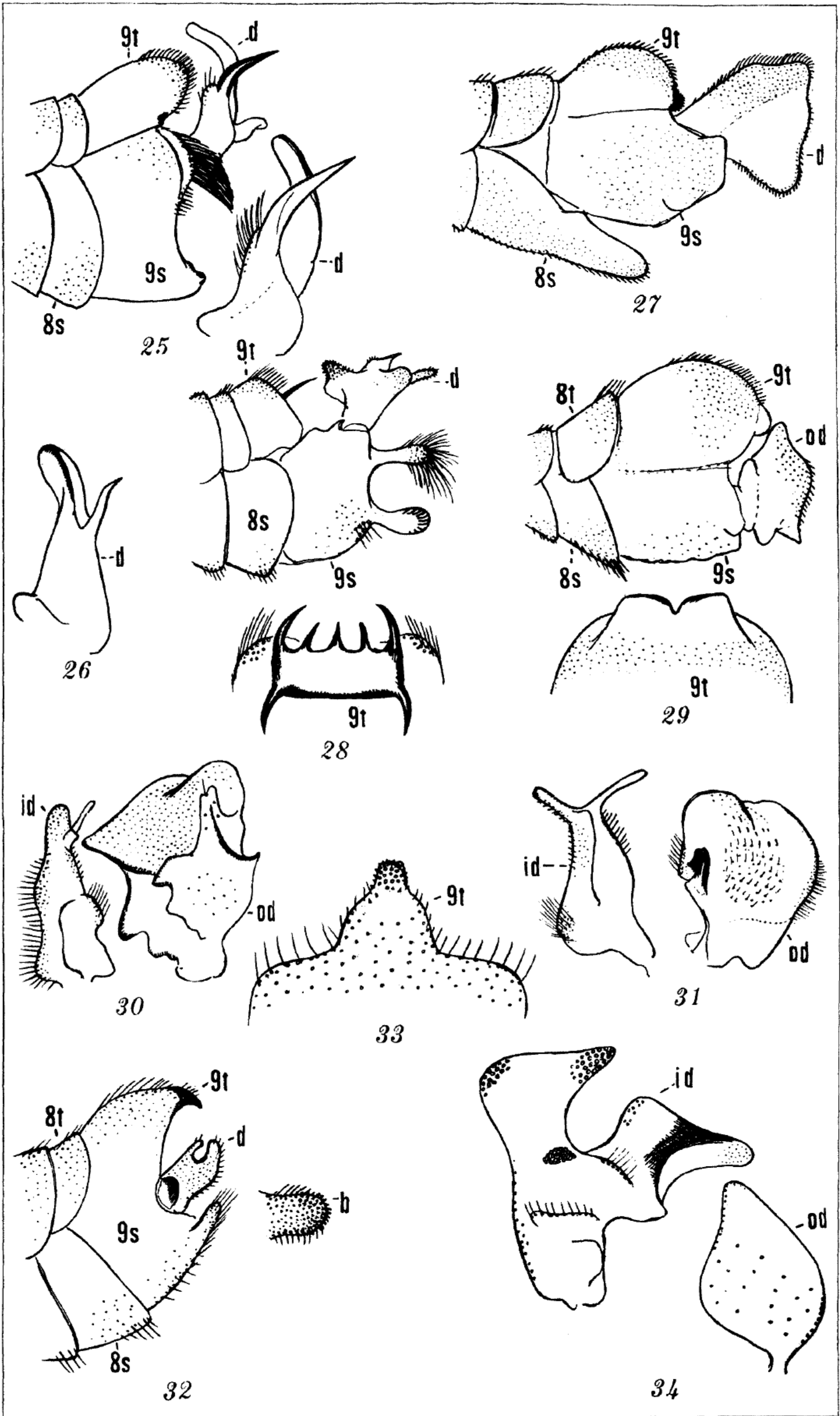


PLATE 2.

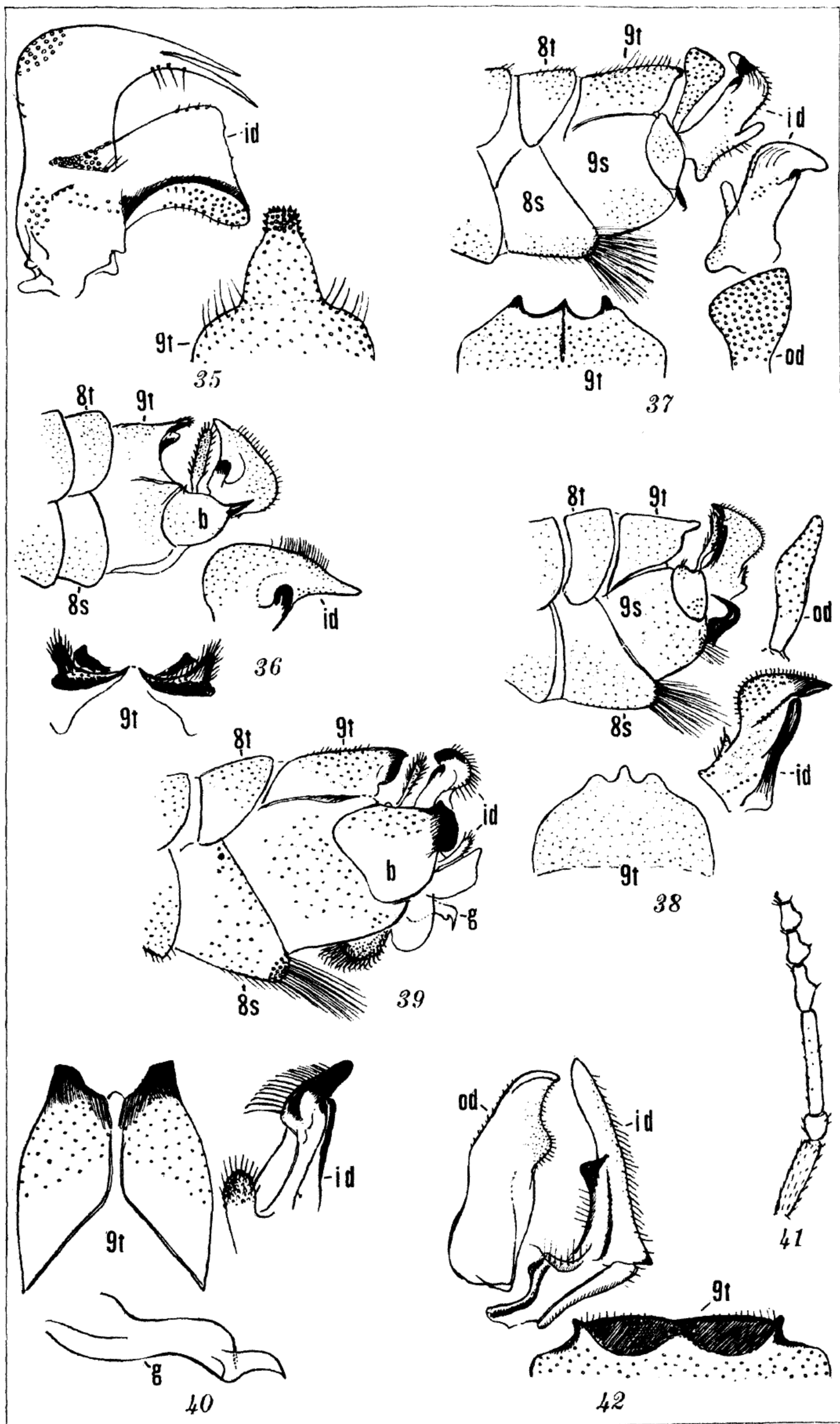


PLATE 3.

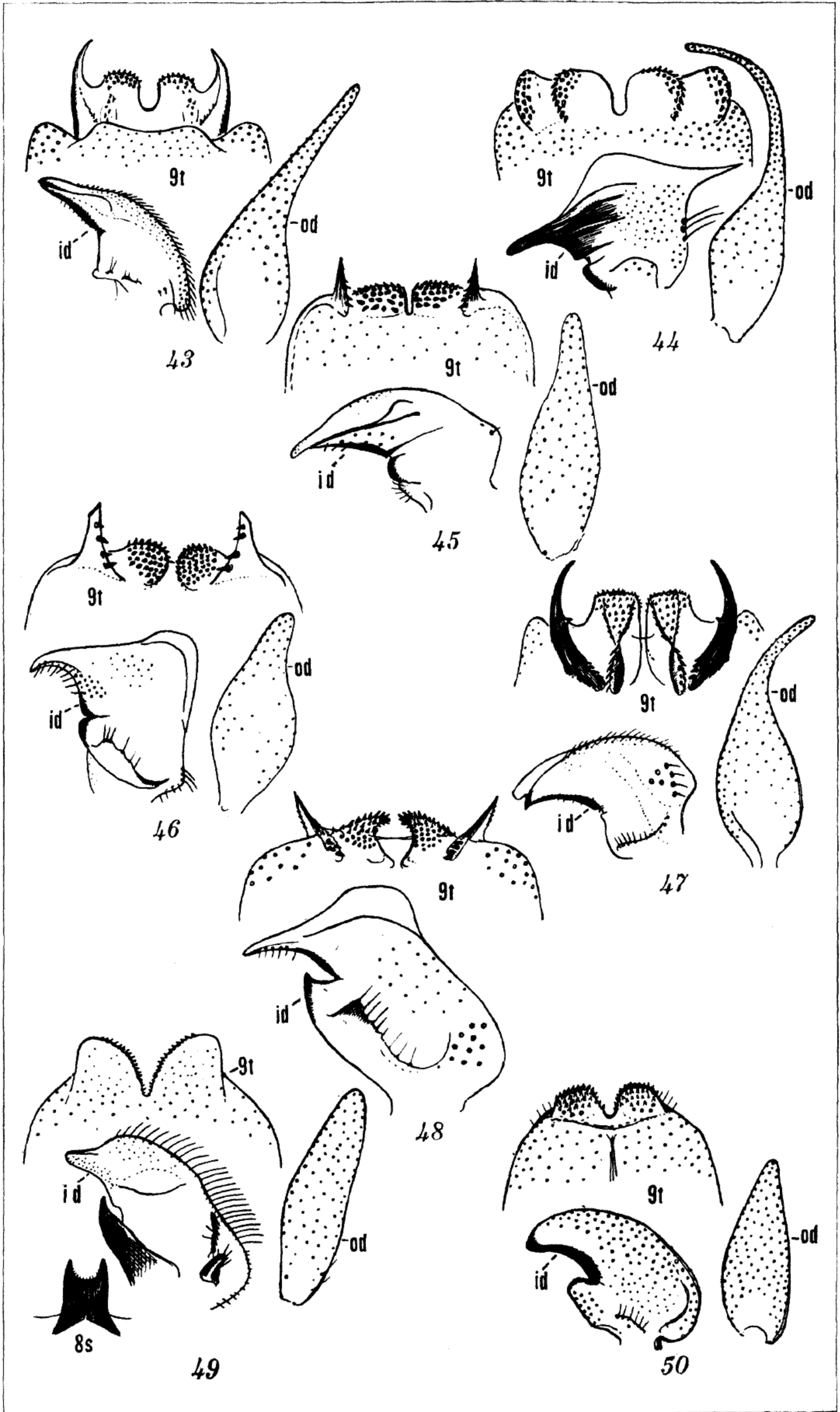


PLATE 4.