

NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN
ASIA (DIPTERA), XVII¹

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FIVE PLATES

The Tipulidæ discussed at this time were included in extensive series of specimens from eastern Siberia, sent to me for determination by Dr. Theodore Pleske and Dr. A. von Stackelberg, of the Russian Academy of Sciences, Leningrad. In this report, species of the genus *Tipula* are discussed. I express my deep thanks to the entomologists and collectors mentioned in the text for the opportunity of studying this unusually interesting series of crane flies. The types of the novelties are preserved in the Russian Academy of Sciences.

There is, perhaps, no faunal region on earth where a wider acquaintance with species from many other localities is required. In eastern Siberia, in addition to the far more numerous endemic forms, there occur elements derived from three distinct sources, as follows:

1. *From the south.*—Japan and eastern China. Many species hitherto reported only from Japan are now known to range at least as far as the Ussuri, and, in cases, still farther to the north. Representatives of genera, subgenera, and species of tropical affinities reach the Ussuri, including *Pselliophora*, *Libnotes*, *Limonia* (*Rhipidia*) *pulchra* de Meijere, *Paratropesa*, and *Styringomyia*.

2. *From the west.*—Europe and western Asia. Several species of well-known European crane flies reach the Amur country unchanged; these include more especially members of the subfamily Limoniinæ, as *Tipula* (*Tipula*) *czizeki* de Jong, *Limonia* (*Dicranomyia*) *patens* (Lundström), *Pedicia* (*Pedicia*) *arctica* Frey, *Limnophila* (*Limnophila*) *pictipennis* Meigen, *L.* (*Tricholimnophila*) *punctum* Meigen, and others. Still other forms, while allied to European species, show characters deemed to

¹ Contribution from the entomological laboratory, Massachusetts State College.

be of specific worth. In most of the last-named cases, a third vicarious species occupies boreal North America, so the various members are about equidistantly spaced throughout the boreal and subboreal portions of the Northern Hemisphere. Examples of such representative forms chosen from the genus *Tipula* are as follows:

Western Palæarctic (Europe).	Eastern Palæarctic (eastern Siberia).	Northern Nearctic (Canada).
<i>excisa</i> Meigen.	<i>excisoides</i> sp. nov.	<i>balioptera</i> Loew.
<i>subexcisa</i> Lundström.	<i>lundströmiana</i> sp. nov.	<i>serta</i> Loew.
	<i>dershavini</i> sp. nov.	<i>senega</i> Alexander.
<i>vafra</i> Riedel.	<i>cupida</i> sp. nov.	<i>fragilina</i> Alexander.
<i>luteipennis</i> Meigen.	<i>mediolobata</i> sp. nov.	
<i>quadrivittata</i> Staeger.	<i>subsulphurea</i> Alexander.	<i>sulphurea</i> Doane.

Certain genera and subgenera, as *Acutipula* Alexander, *Thaumastoptera* Mik, *Limnophila* Meigen, sensu strictu, and *Tricholimnophila* Alexander, occupy the entire northern Palæarctic Region but apparently have not reached the American continent.

3. *From the east.*—Alaska and the Canadian northwest. A growing list of species falls in this category, including *Tipula macrolabis* Loew, *Limonia (Discobola) argus* (Say), *L. (D.) platyrostra* Alexander, and *Limnophila unica* Osten Sacken. In Asia such species occur in Kamchatka and southward and have evidently been distributed via the Aleutian and Commodore Islands, rather than to the northward across the narrower Bering Strait.

In addition to all the above, there is found a considerable number of very widespread forms that range throughout the entire Holarctic Region, including hardy representatives of *Limonia*, *Helobia*, *Trimicra*, and other genera.

TIPULINÆ

Genus TIPULA Linnæus

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

Subgenus VESTIPLEX Bezzi

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

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

Numerous species of *Vestiplex* are found throughout the Holarctic Region. The characters of the group have been recast by Edwards in the paper cited above, and it is my purpose here

only to note a few additional points concerning the details of structure of the male hypopygium.

The caudal portion of the ninth tergite is often, if not usually, heavily sclerotized and blackened, forming a more or less distinct shallowly depressed area with narrow raised rims that is herein discussed as the "tergal saucer." Behind this saucer, less heavily thickened portions of the tergite occur, the median line being almost invariably more membranous. In a number of species of *Vestiplex*, the tergal saucer tends to swing ventrad so as to lie on the lower face of the tergite, in which case the only part of the sclerite visible from above is the feebly sclerotized cephalic portion, together with the cephalic rim of the saucer, where this is developed. In such cases, when treated with caustic soda, the saucer swings dorsad and cephalad so as to assume its normal position. This curious occurrence was first noted by Mr. Edwards, and unless appreciated may cause confusion in the separation of allied species. In most species of *Vestiplex*, the blackened tergal saucer occupies the caudal half or more of the tergite; in a few species, as *tchukchi* sp. nov., the saucer is so extensive that it embraces the entire mid-dorsal area of the tergite. In other forms, the saucer is pale yellow, only feebly sclerotized, and is delimited behind only by the variously modified mid-cephalic rim of the plate (as in *immunda* sp. nov., *pallitergata* sp. nov.). Both cephalic and caudal rims of the saucer may bear major teeth or denticles, the size of which is best judged when viewed laterally. In the *excisa* group, the mid-caudal region of the plate bears a stout median spine (*excisoides* sp. nov., *kamchatkana* sp. nov.).

The basistyle is sometimes simple but more often its caudal margin is produced into a conspicuous spine that may be either pale, tipped with black, or entirely blackened. Such a spine is found in the four commonest European species (*excisa* Schummel, *nervosa* Meigen, *rubripes* Schummel, and *scripta* Meigen) but is lacking in *sintenisi* Lackschewitz. The species of *Vestiplex* in eastern Siberia fall in the following groups based on this feature of the basistyle:

1. Basistyle unarmed; *arctica* Curtis, *kuwayamai* Alexander, *subcentralis* Alexander, *tchukchi* sp. nov., *transbaikalica* sp. nov.
2. Basistyle with an elongate acute spine; *excisoides* sp. nov., *immunda* sp. nov., *kamchatkana* sp. nov., *pallitergata* sp. nov.
3. Basistyle with spine expanded at tip to appear more or less bifid; *coquilletiana* Alexander.

The male of *Tipula jakut* Alexander is unknown. Whether the true *arctica* occurs in eastern Siberia is somewhat questionable to me, although it is definitely known from Taimyrland (reported in letter by Lackschewitz). The species falls in the group with unarmed basistyle and may be told by the dark body coloration, unusually marked nodulose antennæ of the male sex, and the simple structure of the inner dististyle of the male hypopygium.

TIPULA (VESTIPLEX) EXCISOIDES sp. nov. Plate 1, fig. 1; Plate 2, figs. 25, 26.

Allied to *excisa*; nasus short and stout, or lacking; antennæ (male) with the flagellar segments strongly incised, the first flagellar segment pale; terminal flagellar segment elongate; mesonotal præscutum gray, with four darker gray stripes that are narrowly bordered by brown; wings pale brown, variegated by darker brown and whitish areas; abdomen chiefly reddish brown, the outer segments darkened; male hypopygium with the tergal saucer bearing an acute median spine on caudal border.

Male.—Length, 16 to 17 millimeters; wing, 15 to 16; antenna, about 5.

Female.—Length, 25 millimeters; wing, 16; abdomen alone, 19.5.

Frontal prolongation of head yellowish brown, sparsely pruinose; nasus short to lacking; palpi brownish black. Antennæ (male) with the basal three segments yellow, the succeeding one or two weakly bicolorous, the remainder almost uniformly brownish black, the basal enlargement being a trifle darker than the remainder; flagellar segments very strongly incised; terminal segment elongate, exceeding one-third the length of the penultimate. In female, antennæ much shorter, chiefly yellow, only the outer segments darkened. Head gray.

Mesonotal præscutum light gray, with four slightly darker gray stripes that are narrowly bordered by dark brown; scutum light gray, the lobes variegated by darker gray; posterior sclerites of notum light gray. Pleura light gray; dorsopleural region buffy. Halteres pale, the knobs dark brown, their extreme tips pale. Legs with the coxæ gray; trochanters yellow; femora yellow, the tips narrowly and gradually infuscated; tibiæ yellowish brown, the tips darkened; tarsi passing into black. Wings (Plate 1, fig. 1) pale brown, the prearcular and costal regions more yellowish; stigma and smaller areas at origin of Rs and on anterior cord brown; whitish areas on disk, including the

bases of the outer radial cells, cell 1st M_2 , a conspicuous fenestrate area at two-thirds the length of cell M, and a common mark that includes the base of cell M and subbasal spots in cells Cu and 1st A; veins brown. Venation: R_3 sinuous; m a little shorter than the petiole of cell M_1 ; M_{3+4} subequal to or shorter than m.

Abdomen chiefly reddish brown, the outer segments darkened; tergites with a very narrow brown sublateral line, more conspicuous on basal segments, the actual borders narrowly pale; abdomen of female moderately long. Male hypopygium with the caudal portion of ninth tergite (Plate 2, fig. 25, 9t) appearing as a black polished saucer, much as in *excisa* but with the median caudal horn stout, pointed at apex, and unprovided with setæ; cephalic border of saucer, 9t, without, or with but few, raised points or denticles. In *excisa* (Plate 2, fig. 26), the median caudal horn of tergite, 9t, is slender, truncated at tip, the sides of the horn with erect black setulæ; cephalic border of saucer with a series of from six to eight elevated blackened points.

Habitat.—Eastern Siberia (Kamchatka).

Holotype, male, Ajan, $137^{\circ} 30'$ east longitude, $56^{\circ} 40'$ north latitude, July 18 to 31, 1912 (Czerski), No. 726. Allotype, female, Kamchatka River, 159° east longitude, 56° north latitude, July and August, 1914 (Bjeloussov, Hydrographic Expedition to Pacific), No. 558. Paratopotype, 1 male, 1903 (Popoff), No. 447. Paratypes, 4 males, with allotype, Nos. 552, 554, 555, 557; 1 male, Petropavlovsk, July 27, 1907 (Smirnov), No. 650; 1 male, Petropavlovsk, June 17, 1910 (Skorikov), No. 644; 1 male, mouth of Kichiga River, June 27, 1910 (Skorikov), No. 648.

The closest relative of the present fly is *Tipula (Vestiplex) excisa* Schummel, of Europe, which differs in slight structural and colorational details. In *excisa* the flagellum is entirely black, with the terminal flagellar segment small and thimble-like; male hypopygium with the median horn of tergal saucer truncated at apex, the sides with conspicuous, erect, black setulæ. A third member of this restricted group is *T. (V.) balioptera* Loew, of boreal North America, which differs in the bicolorous antennal flagellum and details of structure of the male hypopygium.²

² Alexander, Mem. Cornell Univ. Agr. Exp. Sta. 25 (1919) 948, pl. 46, fig. 227 (wing); pl. 50, fig. 279 (ninth tergite); pl. 54, fig. 337 (lateral aspect of male hypopygium).

TIPULA (VESTIPLEX) KAMCHATKANA sp. nov. Plate 1, fig. 2; Plate 2, fig. 27.

Allied to *excisa*; general coloration of body black, heavily gray pruinose; antennæ (male) with flagellar segments strongly incised; entire antennæ black, excepting the reddish pedicel; præscutum gray, with four slightly darker stripes and a very conspicuous brownish black median præscutal vitta; tips of femora broadly blackened, most extensively so on forelegs; wing pattern very diffuse.

Male.—Length, 14 to 16 millimeters; wing, 14 to 15; antenna, 4.3 to 4.5.

Female.—Length, 12 to 14 millimeters; wing, 12 to 13.

Frontal prolongation of head black, heavily pruinose; nasus distinct; palpi black. Antennæ black, only the pedicel obscure reddish; scape pruinose; in cases the pedicel is black, like the remainder of organ; flagellar segments strongly incised; verticils short and powerful, shorter than the segments; terminal segment about two-fifths the penultimate. Head dark gray, with indications of a blackish median stripe.

Mesonotum gray, the præscutum with four poorly defined grayish brown stripes that are very narrowly bordered by brown, the latter sometimes obsolete, especially on the cephalic portions of the sclerite; a very distinct, dull brownish black, median, præscutal stripe; posterior sclerites of mesonotum blackish, gray pruinose. Pleura gray pruinose; dorsopleural region obscure buffy. Halteres infuscated, the knobs strongly so. Legs with the coxæ gray; trochanters yellow; femora obscure yellow basally, the tips broadly blackened, most extensively so on the forelegs, where nearly the outer three-fifths are darkened, on the posterior femora with more than the outer third blackened; tibiæ and tarsi brown, the latter passing into black. Wings (Plate 1, fig. 2) with a very pale brown tinge, the prearcular and costal regions brighter yellow; stigma pale brown, confluent with similar vague areas on anterior cord; ill-defined whitish areas beyond stigma, across cell 1st M_2 and near outer end of cell M ; veins brown, brighter in the flavous areas. Venation: Cell M_1 variable, from about one-half longer than its petiole to twice as long as petiole.

Abdomen black, dark gray pruinose; lateral borders of tergites pale, the caudal margins very narrowly so. Male hypopygium much as in *excisoides*; tergal plate (Plate 2, fig. 27, 9t) relatively small, the lateral lobes broadly truncated; median-

caudal spine stout; posterior border of saucer with about six blackened denticles. Basistyle and dististyles much as in *excisoides*.

Female generally as in the male; fully winged.

Habitat.—Eastern Siberia (Kamchatka).

Holotype, male, Alpine zone of the Shiveluch Range, 162° 30' east longitude, 56° 40' north latitude, June 25, 1909 (*Dershavin*), No. 399. Allotype, a broken female, Shiveluch Volcano, near Nischnekamchatsk, June 26, 1909 (*Schmidt*), No. 331. Paratopotypes, 3 males, Nos. 395, 397, 398; 1 broken female, No. 396. Paratypes, 1 male, Volcano Kluchevskoje, Kyrgurich, altitude 3,000 to 4,000 feet, June 12, 1909 (*Dershavin*), No. 393; 7 males and females, with the allotype, Nos. 327, 329–330, 332–335, inclusive; 1 male, Kluchevskoje Village, June 10, 1909 (*Dershavin*), No. 357; 1 male, Ust-Kamchatsk, near Nischnekamchatsk, July 17, 1909 (*Dershavin*), No. 348; 1 broken male, Alpine zone of Solocha River, Volcano Kluchevskoje, June 13, 1909 (*Dershavin*), No. 403; 1 female, Krutenkaja River, June 22, 1909 (*Koslovsky*), No. 422. These materials were collected on the Rjabushinsky Brothers Expedition, 1909.

Tipula (Vestiplex) kamchatkana is allied to *excisa* Schummel, *excisoides* sp. nov., and *balioptera* Loew. It is well distinguished by the black antennæ, with only the pedicel obscure reddish, the conspicuous median præscutal stripe, the extensively blackened fore femora, and other features. The general coloration of the entire body is black, heavily pruinose with gray.

TIPULA (VESTIPLEX) PALLITERGATA sp. nov. Plate 1, fig. 3; Plate 2, fig. 28.

General coloration light gray, the præscutum with four darker gray stripes that are conspicuously bordered by brown; antennæ (male) elongate, nearly one-half the length of body; femora obscure yellow, the tips blackened, more extensively so on forelegs; wings with the pattern pale and diffuse, chiefly pale brown and white; male hypopygium with the tergal plate light yellow, including the saucerlike posterior portion; at near center of disk a small transverse elevation bearing two blackened points; spine of basistyle straight, pale, the narrow acute tip blackened.

Male.—Length, 14 to 15 millimeters; wing, 15 to 15.5; antenna, 6.5 to 7.5.

Frontal prolongation of head gray; nasus long and conspicuous; palpi black. Antennæ (male) unusually long for a mem-

ber of this subgenus, only a little less than one-half the length of the body; scape dark, pruinose; pedicel obscure yellow; succeeding segments very weakly bicolorous, dark brown, the basal enlargements black; segments beyond the fifth passing into uniform black; in the paratype the antennæ are much more extensively bicolorous; flagellar segments strongly incised; verticils shorter than the segments; terminal segment about one-third the length of penultimate. Head gray, the vertex with a broad, conspicuous brown line.

Mesonotal præscutum light gray, with four darker gray stripes that are conspicuously bordered by brown, especially on their cephalic portions; intermediate stripes broad in front, narrowed behind, contiguous at ends but widely separated at midlength, the brown margins suffusing the outer ends of stripes; lateral stripes without dark markings along most of their mesal edge; posterior sclerites of notum light gray, the scutal lobes variegated with dark gray, of which the more cephalic area is narrowly ringed with brown; scutellum with a more or less distinct median brown line. Pleura gray; dorsopleural region buffy. Halteres long, pale yellow, the knobs dark brown. Legs with the coxæ pale gray; trochanters obscure yellow; femora obscure yellow, the tips blackened, more extensively so on forelegs where approximately the outer third or more is darkened, very narrowly blackened on the other legs, tibiæ brown, the tips passing into black; tarsi black. Wings (Plate 1, fig. 3) with the ground color very pale brown; prearcular and costal regions light yellow; very extensive whitish areas over most of wing disk, greatly restricting the ground color; slightly darker brown clouds at origin of Rs and on anterior cord; veins brown, yellow in the flavous areas. Venation: M_{3+4} variable, being longer or shorter than the petiole of cell M_1 .

Abdominal tergites reddish brown, narrowly trivittate with brown, the median stripe broader and nearly continuous; sublateral stripes very narrowly interrupted; lateral margins gray; outer segments brown, heavily pruinose, the caudal margins narrowly pale. Male hypopygium brownish yellow, the tergal plate pale, not polished black as in other regional members of the subgenus. Hypopygium with the tergal plate (Plate 2, fig. 28, 9t) pale yellow, including the outer saucer; caudal margin with a broad U-shaped notch, at the base of which is a tiny rounded notch; cephalic portion of saucer with an elevated, blackened

transverse ridge that is set with a blackened point on either side of midline. Basistyle, *b*, with an elongate straight spine, pale except for the short, gently curved apex. Outer dististyle, *od*, pale, slightly flattened. Inner dististyle, *id*, broad, bifid at apex, the outer spine acute.

Habitat.—Eastern Siberia (Ussuri).

Holotype, male, Vladivostok, May 29, 1927 (*Stackelberg*), No. 229. Paratype, male, Maiche region, near Shkotovo, June 4, 1927 (*Sokolov*), No. 579.

The pale yellow ninth tergite of the male hypopygium readily separates this fly from all other regional allied forms. In this respect it suggests the eastern Nearctic *Tipula* (*Vestiplex*) *caroliniana* Alexander and *T. (V.) longiventris* Loew, which are otherwise quite different flies. The antennæ of the male of the present fly are of an unusual length for a member of this subgenus.

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

General coloration light gray, the præscutum with four slightly darker gray stripes that are narrowly bordered by brown; antennæ (male) relatively short; wings with bases of cells R and M narrowly darkened; male hypopygium with the tergal plate pale, the cephalic rim appearing as an elevated quadrate plate, its margin narrowly blackened; basistyle produced into a strong pale spine.

Male.—Length, about 15 millimeters; wing, 16.5; antenna, about 3.

Frontal prolongation of head brownish gray; nasus stout; palpi black. Antennæ (male) unusually short for a member of this subgenus; basal three segments yellow; succeeding segments bicolorous, the basal enlargement darker than the apices; outer segments more uniformly darkened; flagellar segments weakly incised; verticils subequal to or slightly longer than the segments; terminal segment about one-third the penultimate. Head gray; a vague capillary blackish line on vertex; setigerous punctures black, conspicuous.

Mesonotal præscutum light gray, with four slightly darker gray stripes that are narrowly but conspicuously bordered by brown; intermediate stripes a little bowed beyond midlength to expose a linear strip of the ground; scutum light gray, each lobe with two darker gray areas that are very insensibly bordered by brownish, this being especially apparent along the cephalic

borders; posterior sclerites of mesonotum light gray, the mediotergite with a narrow median dusky vitta. Pleura with the mesepisternum gray, the posterior sclerites more whitish gray. Halteres pale, the knobs infuscated. Legs with the coxæ light gray; trochanters yellow; femora obscure yellow, the tips narrowly blackened; tibiæ brownish yellow, the tips narrowly darkened; tarsi passing into black. Wings (Plate 1, fig. 4) with the ground color brown, variegated by darker brown and whitish, the pattern more diffuse than usual; a dark post-arcular area in bases of cells R and M; veins brown. Macrotrichia relatively abundant on veins beyond cord; R_{1+2} glabrous on outer half; vein 1st A entirely without trichia; vein 2d A with numerous trichia on more than distal half. Venation: Cell 1st M_2 elongate, with m-cu just before midlength of lower face.

Abdominal tergites dark reddish yellow, with a narrow, interrupted blackish median stripe; sublateral dark stripes almost obsolete; basal sternites yellow; outer abdominal segments more uniformly darkened. Male hypopygium (Plate 2, fig. 29) with the tergal plate, *9t*, very different from the other regional members of the subgenus. The main body of the tergal saucer is pale, with the caudal margin broadly emarginate, the cephalic border appearing as an elevated quadrate plate whose margin is narrowly blackened; in a position of rest, the pale portion of the saucer is deflected ventrad so the elevated cephalic plate forms what appears to be the extreme caudal edge of the tergite, in this case being directed caudad instead of the normal position of cephalodorsad; caudal lobes of tergite pale with long pale setæ. Basistyle, *b*, with a strong spine, pale in color, the extreme tip acute and blackened. Outer dististyle, *od*, flattened. Inner dististyle, *id*, broad, the outer margin at near two-thirds the length with a sharp spine.

Habitat.—Eastern Siberia (Saghalien).

Holotype, male, Nodeskda Bay, July 9, 1908 (*Soldatov*), No. 682.

In its pale ninth tergite of the male hypopygium, with no blackened armature excepting a glabrous plate at cephalic end of saucer, the present fly is closest to *Tipula* (*Vestiplex*) *pallitergata* sp. nov., differing especially in the short antennæ of the male and in the details of structure of the hypopygium. The nature of the tergal saucer is different from that of any other Old World species known to me.

TIPULA (VESTIPLEX) COQUILLETIANA Alexander.

Tipula coquilletiana ALEXANDER, Philip. Journ. Sci. 24 (1924) 605-606; *Encycl. Entomolog., Diptera* 2 (1925) 91-92, figs. 6-8 (details of male hypopygium).

The types, two males, were collected at Odasam, southern Saghalien, in August by Prof. Teiso Esaki. A further male was later taken in Hokkaido, Japan, in August, by Mr. Tamanuki.

A further series of specimens from eastern Siberia seem surely referable to this species, despite certain slight differences in coloration and structure. The subapterous female is described below as allotype.

Allotype.—Female, length, about 30 millimeters; wing, 5; abdomen alone, 24.

Wings greatly reduced, stenopterous, appearing almost uniformly infuscated. Basal four or five flagellar segments pale, the succeeding segments bicolorous, the outer segments more uniformly darkened. Præscutal stripes poorly indicated against the gray ground color. Abdomen long, chiefly gray, the tergites obscure reddish on either side of midline. Ovipositor with tergal shield and cerci polished brownish black. Hypovalvæ terminating in slender, hairlike points.

Allotype, female, Nikolajevsk, Amur River, July 21, 1915 (*Chernavin*), No. 701.

Other records: A female, Chhil region, Amur River, Ussuri, July 28, 1908 (*Soldatov*), No. 660; a female, Selenyi border, Ussuri, 600 kilometers from Habarovsk, 1908 (*Soldatov*), No. 681; males and females, Osernaja, mouth of the Amur, June 10 to 13, 1915 (*Chernavin*), Nos. 705, 708, 712; a female, Okonen River, Amur, June 21 to 23, 1914 (*Dorogostaiski*), No. 599; a female, with the allotype, No. 704.

It is possible that more than a single species is confused in the above series, since the antennal flagella vary in color from brownish black to bicolorous, but in the absence of sufficient males, I am unable to separate the flies.

TIPULA (VESTIPLEX) KUWAYAMAI Alexander.

Tipula kuwayamai ALEXANDER, *Ann. Ent. Soc. Am.* 14 (1921) 130-131; *Encycl. Entomolog., Diptera* 2 (1925) 93.

Described from Sapporo, Hokkaido, Japan; collected in June by Prof. Satoru Kuwayama. Later (Alexander, 1925) reported from the Ussuri. A considerable series of additional specimens are available.

Golden Horn, Vladivostok, May 25 to June 1, 1911 (*Rydzevski and Kuznetzov*), Nos. 427 to 429; Sedanka, near Vladivostok, June 20, 1927 (*Stackelberg*), No. 248; Okeanskaja station, June 25, 1926 (*Mordvilko*), No. 614; Tigrovaja, Suchan district, June 3 and 4, 1927 (*Stackelberg*), No. 93; Vinogradovka, May 30 to June 2, 1929 (*Djakonov and Filipjev*), Nos. 548, 549; Maiche region, near Shkotovo, June 7, 1927 (*Sokolov*), Nos. 570, 573; Spassk, June 4, 1928 (*Obolenskij*), No. 589; Kamen-Rybolov, Lake Chanka, May 24 and 25, 1908 (*Czerski*), No. 301; Seja River, Amur Province, June 27 to 29 (*Rittig*), No. 639; Saghalien Island, August 9 to 22, 1906 (*Smirnov*), No. 649; Pilva, Saghalien, June 27, 1910 (*Derbeck*), No. 319.

Many of the specimens, especially the males, average somewhat larger than the types (male, length, 19 to 20 millimeters; wing, 21 to 23; female, length, 28 to 31 millimeters; wing, 24 to 25). In some specimens, all four præscutal stripes are clear light gray, bordered by brown; in certain other cases, the intermediate stripes are more suffused with brown, especially on their posterior portions, the broad lateral stripes remaining clear light gray, contrasting strongly with the intermediate pair. In some other specimens, the interspaces likewise become suffused with light brown.

TIPULA (VESTIPLEX) TRANSBAIKALICA sp. nov. Plate 1, fig. 5; Plate 2, fig. 30.

General coloration of head and thorax gray, the præscutal stripes scarcely differentiated from the ground; antennæ with basal flagellar segments bicolorous; knobs of halteres yellow; wings pale brown, with a weak darker brown and white pattern; abdomen obscure yellow, the subterminal segments darker; male hypopygium with a conspicuous, polished, black tergal saucer, the caudal rim notched medially, the lateral lobes obliquely truncated and coarsely toothed; no caudal production of basistyle; outer dististyle flattened-oval; inner dististyle unusually short, bifid at apex.

Male.—Length, about 18 millimeters; wing, 19; antenna, about 3.8.

Frontal prolongation of head reddish brown; nasus short and stout; palpi obscure brownish yellow, the outer segment darkened at outer end. Antennæ with scape and pedicel obscure yellow; basal flagellar segments bicolorous, the basal enlargement dark brown, the stem yellow; fifth and succeeding flagellar segments more uniformly darkened; terminal segment slightly exceeding one-half the length of the penultimate. Head dark gray.

Pronotum brownish gray. Mesonotal præscutum almost uniformly dark gray, the usual stripes scarcely differentiated from the ground; posterior sclerites of mesonotum gray, the scutellum more brownish. Pleura extensively brownish gray, the posterior sclerites, especially the pleurotergite, more yellowish; dorsopleural membrane buffy. Halteres pale, the knobs light yellow. Legs with the coxæ light gray pruinose, the apices paling to yellowish; trochanters yellow; femora yellow, the tips narrowly dark brown; tibiæ reddish brown, the tips darkened; tarsi brownish black. Wings (Plate 1, fig. 5) with the ground color very pale brownish, the prearcular and costal regions light yellow; stigma brown; much reduced brown clouds at origin of Rs and on anterior cord; whitish hyaline areas as follows: An incomplete cross band beyond cord, occupying parts of cells Sc₂, R₂, and R₃, separated from an oblitative area across cell 1st M₂ by a darkened seam along vein M₁₊₂; an ill-defined white area in cell M beneath origin of Rs; veins brown, oblitative areas extensive. Venation: R₁₊₂ entire, the distal half glabrous; petiole of cell M₁ about twice the length of m; M₃₊₄ about three-fourths the basal section of M₃; m-cu on M₄ just beyond base.

Abdomen obscure yellow basally, the mid-line of basal tergites with a narrow to scarcely evident broken brown line; subterminal abdominal segments darkened. Male hypopygium (Plate 2, fig. 30) with the basistyle large, chiefly separated from the sternite by extensive dorsal and ventral sutures, the intermediate fourth or thereabouts fused. Ninth tergite, 9t, with the caudal portion a conspicuous blackened saucer, relatively small, the caudal margin with a U-shaped median notch, the lobes obliquely truncated, with several coarse teeth that alternate with long setæ; cephalic margin of saucer elevated, each half with two teeth, the lateral pair larger. Basistyle without armature. Outer dististyle, *od*, a flattened oval blade, with numerous pale setæ. Inner dististyle, *id*, unusually short, less than the outer style, bifid at apex.

Habitat.—Eastern Siberia (Transbaikal).

Holotype, male, Borochojeva (ex Staudinger-Bang Haas); type in author's collection.

Among the regional species, *Tipula (Vestiplex) transbaikalica* is most nearly allied to flies such as *T. (V.) subcentralis* Alexander, differing conspicuously in the structure of the male hypopygium. The fly is even more closely related to *T. (V.) sintenisi* Lackschewitz, of northern Europe, which differs in the black palpi, dusky knobs of halteres, brown-margined præscutal

stripes, and other features; the details of the male hypopygium are very similar in the two species.

TIPULA (VESTIPLEX) SUBCENTRALIS Alexander. Plate 2, fig. 31.

Tipula subcentralis ALEXANDER, Journ. New York Ent. Soc. 26 (1918) 73-74; Encycl. Entomolog., Diptera 2 (1925) 92-93, figs. 9-11 (details of male hypopygium).

The type, and previously only known specimen, is a unique male that was collected in Kamchatka by Leonhard Stejneger.

Two additional specimens present the following data: A male, in teneral condition, Kamchatka River, Kamchatka, 159° east longitude, 56° north latitude, 1898 (*Gondatti*), No. 591. A second male in good condition, valley of Bystraja River, Kamchatka, July 15, 1908 (*Protopov*), No. 419.

The male hypopygium has the tergal saucer with caudal margin subtransverse to very feebly notched, the margin with microscopic denticles, of which a submedian pair is slightly larger; cephalic border of saucer with scanty denticles. Basistyle unarmed. Outer dististyle (Plate 2, fig. 31, *od*) a narrowly flattened pale lobe. Inner dististyle, *id*, terminating in a simple, obtusely rounded apex, with a carina back from tip. The simple inner dististyle is characteristic of the species.

TIPULA (VESTIPLEX) TCHUKCHI sp. nov. Plate 1, fig. 6; Plate 2, figs. 32, 33.

Size small (wing about 12 to 13 millimeters); mesonotum black, with four darker gray stripes; antennæ (male) with flagellar segments strongly incised; basal flagellar segments bicolorous; male hypopygium with the tergal saucer very large, heavily blackened, extended cephalad so as to overlie the eighth tergite, the cephalic border elevated; basistyle unarmed.

Male.—Length, about 11 to 12 millimeters; wing, 12 to 13.2.

Female.—Length, about 16 millimeters; wing, 12.

Frontal prolongation of head dark gray; nasus short and blunt; palpi brownish black. Antennæ (male) of moderate length; scape brownish yellow; pedicel and first flagellar segment obscure yellow; succeeding flagellar segments weakly bicolorous, the basal enlargement black, the outer portion obscure yellow; outer segments more uniformly blackened; flagellar segments rather strongly incised, only a very little less so than in the *excisa* group. Head gray, with a capillary black median vitta extending the whole length of the sclerite.

Mesonotal præscutum black, very thinly pruinose with dark leaden gray to produce four scarcely apparent stripes, the interspaces darker; the paratypes have the pruinosity heavier to

produce four dull gray stripes that are vaguely bordered by brown; posterior sclerites of notum gray. Pleura light gray, the dorsopleural region more buffy. Halteres pale yellow, the knobs weakly darkened. Legs with the coxæ light gray; trochanters yellow; remainder of legs broken. Wings (Plate 1, fig. 6) with the ground color very pale brown, variegated by whitish areas; prearcular and costal regions light yellow; stigma oval, dark brown; the white areas include a nearly complete fascia beyond cord, a large conspicuous spot in outer half of cell M, the bases of cells Cu and 1st A, with other less evident brightenings; veins brown, paler in the white areas. Venation: M_{3+4} subequal to or shorter than basal section of M_3 .

Abdomen with basal tergite brownish gray; succeeding tergites yellow, with a very narrow median brown stripe that is narrowly interrupted at caudal margin of the segments; lateral borders of tergites rather narrowly bordered by buffy, delimited internally by a delicate dusky line; outer segments, including hypopygium, uniformly blackened; basal sternites yellow. In the female, the tergites show three broader and more continuous brown stripes that continue caudad to the shield of the ovipositor. Male hypopygium (Plate 2, fig. 32) with the tergal saucer (Plate 2, fig. 33, 9t) unusually large and conspicuous, heavily blackened, when viewed from above covering the whole dorsal surface of tergite; posterior border of saucer free and conspicuously elevated, in a position of rest extending back over the caudal border of the eighth tergite, quite concealing the midcephalic region of the ninth tergite; viewed laterally, the saucer bears about four spinous points on either side, the cephalic and caudal ones larger; lobes of caudal border of tergite broadly truncated and provided with microscopic blackened denticles. Basistyle small, entirely unarmed. Outer dististyle, *od*, moderately flattened, dusky in color. Inner dististyle, *id*, flattened, the apex only shallowly bidentate. Ovipositor with the dorsal teeth of cerci subobsolete, the ventral row conspicuous.

Habitat.—Eastern Siberia (Anadyr Region, Kamchatka).

Holotype, male, Markovo, Chuckchiland, Anadyr Gulf, 170° east longitude, 65° north latitude, July 6, 1896 (*Gondatti*), No. 586. Allotopotype, female, No. 585. Paratypes, 2 males, mouth of Kichiga River, Kamchatka, June 27, 1910 (*Skorikov*), Nos. 646, 647.

The specific name is that of an aboriginal tribe inhabiting extreme northeastern Asia. In the unarmed basistyle, the present fly groups with species such as *kuwayamai* Alexander, *sub-*

centralis Alexander, and *transbaikalica* sp. nov., differing from all in the small size, general coloration, and, especially, the very extensive tergal saucer of the male hypopygium.

Subgenus ARCTOTIPULA subgen. nov.

Nasus in most cases relatively short. Body conspicuously hairy, with setæ, on all coxæ and usually on sternopleurite. Tibial spur formula 1-2-2; claws simple. Squama naked; veins beyond cord without macrotrichia 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 more abundant. Venation: R_{1+2} entire; cell M_1 usually short-petiolate to sessile, longer in certain species, as *alascænsis*; m-cu lying proximad of to about opposite r-m. Abdomen often depressed. Male hypopygium of simple structure, the tergite separate from sternite. In female, the terminal abdominal segments abruptly narrowed, the ovipositor very small; cerci moderately elongate and only weakly sclerotized, the margins smooth; hypoalvæ small and compressed.

Type of subgenus.—*Tipula besselsi* Osten Sacken (Arctic America).

Other included species are *T. salicetorum* Siebke (equals *T. nigricornis* Zetterstedt, preoccupied); *T. zetterstedti* Strobl, of northern Europe; *T. alascænsis* Alexander, *T. besselsoides* Alexander, and *T. piliceps* Alexander, of Arctic North America; and four species from eastern Asia, defined as new at this time, *T. gavronskii*, *T. hirtitergata*, *T. popoffi*, and *T. tundrensis*.

The chief features of subgeneric importance lie in the unusually glabrous wing veins and the peculiar structure of the ovipositor. As in some other subgeneric groups of *Tipula*, the male sex is more difficult of definition than is the female. The outer medial, cubital, and anal veins either entirely lack macrotrichia or these are greatly reduced. The abruptly narrowed genital segment of the female of most species, with small weak cerci, are likewise distinctive. *Tipula tundrensis* differs from the other included species in having a more glabrous body, the terminal segments of female abdomen not conspicuously narrowed, and the valves of the ovipositor approaching the type found in *Vestiplex*, though with smooth-margined cerci. The species further shows the caudal margin of the eighth sternite of the male hypopygium to be armed with setæ and hair pencils, characters that again are foreign to both *Arctotipula* and

Vestiplex. Riedel³ records *besselsi* Osten Sacken from the Polar Ural region, but I must regard this identification as being very doubtful.

TIPULA (ARCTOTIPULA) HIRTITERGATA sp. nov. Plate 1, fig. 7; Plate 3, fig. 34.

General coloration brownish gray, the præscutum with four brown stripes; wings grayish subhyaline, stigma brown; no veins with oblitative sections; cell M_1 petiolate; abdomen obscure yellow, the tergites with a median brown longitudinal stripe that is narrowly interrupted at the caudal portion of the segments; ninth tergite of male hypopygium with very abundant black setæ that cover the entire outer portion of disk, the caudal margin with a deep U-shaped notch.

Male.—Length, about 16 millimeters; wing, 17; antenna, about 4.

Frontal prolongation of head relatively short and stout, buffy brown; nasus long and slender; palpi light brown. Antennæ with scape and pedicel brownish yellow; flagellum dark brown; flagellar segments relatively short, feebly incised, with basal verticils only, the longest of these subequal to segment; terminal segment thimble-shaped. Head gray; eyes relatively small; genæ prominent.

Mesonotal præscutum brownish gray, with four brown stripes, the intermediate pair separated only by a capillary line of the ground; lateral margins of præscutum, and especially the humeral regions, clearer gray; interspaces with appressed white setæ; scutum brownish gray, the lobes with slightly darker brown stripes; scutellum pale brown, mediotergite gray; a vague capillary median brown vitta extends from the præscutum to abdomen. Pleura light gray; dorsopleural membrane more buffy. Halteres buffy yellow throughout. Legs with the coxæ light gray, with conspicuous white setæ; trochanters yellow; femora obscure yellow, the tips weakly darkened; tibiæ and tarsi more infuscated. Wings (Plate 1, fig. 7) grayish subhyaline; stigma brown; veins pale brown, without oblitative areas. Macrotrichia relatively abundant but small, on veins beyond cord including an almost complete series on R_3 , R_{2+3} , outer section of R_{4+5} , and a weak series of about a score of trichia on M_1 ; a few trichia near outer end of vein M ; other trichia on Cu_1 on either side of level of $m-cu$; a series on distal third of $2d A$; other veins behind R_1 chiefly destitute of trichia. Venation:

³ Mem. Acad. Sci. Russ. VIII 28, No. 8 (1919) 8.

R_{1+2} entire; petiole of cell M_1 about one-half m; M_{3+4} short, about one-third m; m-cu on M_4 shortly beyond origin.

Abdomen depressed, obscure yellow, the tergites with a conspicuous median longitudinal stripe that is narrowly interrupted at caudal margin of each segment, the areas of the individual segments being narrowed to a point behind; lateral borders of tergites paling to whitish; sternites uniformly yellowish white; pleural membrane darkened. Male hypopygium of unusually simple structure; tergite separate from sternite; basistyle and sternite fused. Ninth tergite (Plate 3, fig. 34, 9t) with a very deep U-shaped median notch, the lateral lobes relatively slender, grading to the lateral shoulders; outer half of tergite darkened but not heavily sclerotized, the surface of this portion with abundant coarse black setæ, those of the sides longer and more whitish; posterior half of tergite with sparse setæ; lobes of tergite fringed with delicate pale setulæ. Outer dististyle, *od*, broadly flattened, entirely pale. Inner dististyle, *id*, with a conspicuous, slightly curved black spine on outer margin at near two-thirds the length, the apical portion leaflike; a small group of peglike spines in axis of outer spine. Ninth sternite without lobes. Eighth sternite unarmed.

Habitat.—Eastern Siberia (Amur).

Holotype, male, Dulysmar River, June 5, 1914 (*Dorogostaiski*), No. 601.

Tipula (*Arctotipula*) *hirtitergata* is quite distinct from the other regional species of the subgenus in the petiolate cell M_1 and uniform coloration of wings, the latter without evident oblitative areas.

TIPULA (ARCTOTIPULA) GAVRONSKII sp. nov. Plate 1, fig. 8; Plate 3, fig. 35.

General coloration gray, the præscutum with four darker stripes, the intermediate pair pale, narrowly margined with blackish, the lateral stripes solidly darkened; antennæ with the seven basal segments yellow; wings with a strong brown tinge, only slightly variegated by darker and pale areas; cell M_1 sessile; numerous macrotrichia on veins M_1 and M_2 ; abdomen depressed, obscure yellow; both the tergites and sternites with an interrupted brownish black median stripe; ovipositor abruptly narrowed; cerci weak and pale.

Female.—Length, about 17 millimeters; wing, 17.

Frontal prolongation of head relatively short and stout, yellowish brown, more pruinose above; nasus powerful; palpi

brown. Antennæ with the basal seven segments yellow, the smaller outer segments darker; basal enlargements of segments scarcely developed; verticils exceeding the segments; terminal segment nearly as long as penultimate. Head gray, with a conspicuous dusky median line.

Mesothorax massive. Mesonotum gray, the præscutum with four darker stripes, the intermediate pair dark gray, narrowly bordered by blackish, the lateral borders beginning at about one-fourth the length of the sclerite, narrowed behind, ending just before the suture; median dark vitta, representing the common internal border of the intermediate stripes extending the entire length of præscutum; lateral stripes relatively narrow but uniformly blackened; humeral region and lateral border of præscutum before suture infuscated; scutum gray, each lobe variegated with blackish areas; scutellum dark gray, brownish black medially, the parascutella pale; mediotergite gray, with a conspicuous dark median line. Pleura buffy, variegated with gray on anepisternum, sternopleurite, and meron; sternopleurite glabrous. Halteres yellow, the knobs dark brown. Legs with the coxæ brownish gray; trochanters yellow; femora yellow, the tips narrowly but very conspicuously blackened; tibiæ yellow, the tips blackened, the degree approximately twice the femoral darkening; tarsi brown; tibial spurs sinuous; claws (female) simple. Wings (Plate 1, fig. 8) with a strong brown tinge, the stigma darker brown; oblitative areas before stigma and across cell 1st M_2 ; veins brown. Macrotrichia numerous on veins beyond cord, including both M_1 and M_2 , becoming more sparse on M_3 . Venation: R_{1+2} entire; cell M_1 sessile; m-cu at fork of M_{3+4} , opposite r-m.

Abdomen depressed; basal six tergites obscure yellow, with a very conspicuous, nearly continuous, brownish black, median stripe, this very narrowly interrupted at the extreme caudal margins of segments; terminal segments uniformly dark brown; much paler brown sublateral stripes on tergites; lateral borders pale; sternites yellow, segments two to five, inclusive, with a clearly defined broken black median stripe. Abdominal segments (Plate 3, fig. 35, o) beyond the eighth abruptly narrowed; cerci pale, weakly developed, wider at base, narrowed beyond mid-length; basal portion of cerci with pale delicate setulæ.

Habitat.—Eastern Siberia (Ussuri).

Holotype, female, Vladivostok, August 10, 1903 (*Gavronsky*), No. 499.

Tipula (*Arctotipula*) *gavronskii* is named in honor of the collector, who has collected numerous Tipulidæ near Vladivostok. The species is readily told from the other members of the subgenus by the strongly infumed wings, with an unusual number of macrotrichia on the outer medial veins and with cell M_1 sessile. The most similar member of the subgenus is *T. (A.) popoffi* sp. nov. Attention should be called to the superficially similar *Tipula moiwana* (Matsumura), which is associated with the present fly in collections, but is a typical member of the genus, with normally developed cerci.

TIPULA (ARCTOTIPULA) POPOFFI sp. nov. Plate 1, fig. 9; Plate 3, fig. 36.

Mesonotal præscutum light gray, with four darker gray stripes; antennal flagellum black; femora yellow, the tips narrowly infuscated; wings yellowish gray; stigma brown; wing disk scarcely variegated; macrotrichia of veins beyond cord almost lacking; cell M_1 sessile or nearly so; abdominal tergites yellow, trilineate with dark brown, the lateral borders whitish; sternites clear light gray, the caudal borders yellow.

Female.—Length, about 17 millimeters; wing, 18.5; antenna, about 3.3.

Frontal prolongation of head gray, with long yellow setæ; nasus very short and broad; palpi black. Antennæ with the scape and pedicel brownish yellow; flagellum black; verticils of flagellum exceeding the segments. Head brownish gray, somewhat clearer gray on front and along orbits.

Pronotum light gray, darker medially. Mesothorax broad and massive, the præscutum light gray with four darker brownish gray stripes, the intermediate pair only narrowly separated; interspaces with short yellow setæ; posterior sclerites of thorax gray, the scutellum and mediotergite with indications of a darker median line. Pleura gray, the dorsopleural region buffy; mesopleura glabrous. Halteres yellow, the knobs infuscated. Legs with the coxæ gray, with conspicuous white setæ; trochanters yellow; femora yellow, the tips narrowly infuscated, the amount subequal on all legs; tibiæ brownish yellow; tarsi pale brown. Wings (Plate 1, fig. 9) with a yellowish gray tinge; stigma brown; obliterative areas restricted; vague cream-colored brightenings before and beyond stigma; veins brown. Macrotrichia of veins beyond cord very sparse to virtually lacking, those on vein R_{4+5} being restricted to a series of about a dozen and very small. Venation: R_{1+2} nearly straight, diverging strongly from R_3 ; cell M_1 very short-petiolate to sessile; M_{3+4} about one-third the basal section of M_3 .

Abdomen stout, the tergites conspicuously trilineate with dark brown, the narrower median stripe slightly interrupted at caudal margins of segments, the sublateral stripes broader and more nearly continuous; lateral borders of tergites broadly whitish; remainder of tergites, including the interspaces and caudal borders of segments bright yellow; eighth and succeeding segments darkened; sternites uniformly clear light gray, only the narrow posterior borders pale yellow. Ovipositor (Plate 3, fig. 36, o) with the segments suddenly narrowed, as normal for the subgenus; cerci pale, outer margins a little dilated before tips.

Habitat.—Eastern Siberia (Jakutsk).

Holotype, female, between Ajan and Nelkan, Tongi River Valley, 137° 30' east longitude, 56° 40' north latitude, June 9 to 15, 1903 (*Popoff*), No. 441.

The nearest ally is *Tipula* (*Arctotipula*) *gavronskii* sp. nov., which is readily told by the strongly darkened wings, different thoracic coloration, dark median stripe on abdominal sternites, abundant macrotrichia on outer veins of wings, and other characters.

TIPULA (ARCTOTIPULA) TUNDRENSIS sp. nov. Plate 1, fig. 10; Plate 3, figs. 37, 38.

General coloration gray, the præscutum with three slightly darker gray stripes; antennæ black, relatively short; wings brown, marmorate with whitish and sparse darker brown areas; abdomen dark gray throughout; male hypopygium with the caudal margin of eighth sternite provided with hair pencils; ovipositor not conspicuously narrowed, the cerci relatively wide, with smooth margins.

Male.—Length, about 14 millimeters; wing, 15; antenna, about 3.8.

Female.—Length, about 17 millimeters; wing, 14.5.

Frontal prolongation of head gray; nasus stout; palpi black. Antennæ black, the scape pruinose; pedicel sometimes more or less reddish at tips; flagellar segments relatively short but still longer than the verticils; terminal segment thimble-shaped. Head gray.

Mesonotum gray, the præscutum with three slightly darker gray stripes that are poorly indicated. Pleura gray, the dorso-pleural membrane buffy. Halteres yellow, the knobs infuscated. Legs with the coxæ pruinose; trochanters black; femora deep reddish brown, the tips blackened; tibiæ dark brown; tarsi black. Wings (Plate 1, fig. 10) brown, marmorate with whitish and sparse darker brown areas, the most evident of the latter being

the stigma; restricted paler brown areas at origin of Rs and on anterior cord; the whitish areas include a post-stigmal fascia extending from C to cell R₅; a prestigmal brightening in cell R₁; a large spot near outer end of cell M, extending caudad into cell Cu; other whitish areas nearer wing base, including an arcuate line from base of cell M, through cells Cu and 1st A, to outer end of latter cell; veins brown. Macrotrichia of veins beyond cord restricted, being limited to a series of about a dozen on outer third of vein R₄₊₅, with very sparse scattered trichia on vein R₃, outer ends of M₁, M₂, and M₃, and a short series at midlength of distal section of Cu₁. Venation: R₁₊₂ entire; cell 1st M₂ long, its inner end pointed; M₃₊₄ about one-half the elongate basal section of M₃; petiole of cell M₁ a little longer than m.

Abdomen dark gray throughout; tergites with basal transverse impressed punctures. Male hypopygium (Plate 3, fig. 37) with the tergite separated from sternite; basistyle, *b*, relatively large, entirely distinct from sternite. Ninth tergite (Plate 3, fig. 38, 9*t*) with a broad V-shaped median notch, the sublateral lobes low and obtuse; on ventral face of tergite a further extension of the plate, apparently homologous with the tergal saucer of *Vestiplex* but confined to ventral surface of tergite; dorsal surface of tergite with very tiny setigerous punctures. A fingerlike appressed lobe, directed mesad and ventrad, lies at caudal margin of basistyle and ninth sternite. Eighth sternite (Plate 3, fig. 37, 8*s*) with caudal margin conspicuously armed, the median portion deeply emarginate, membranous, with a transverse row of long yellow setæ, each lateral angle with a pencil of still longer setæ, the pencil so dense and abundant as to appear almost like a spine. Penis unusually stout and relatively short; ædeagus, *a*, broad-based. Terminal segments of abdomen glabrous or with very small setæ only. Ovipositor with the cerci (Plate 3, fig. 38) unusually widened, somewhat as in *Vestiplex*, but the margins smooth; hypovalvæ short, about one-third the length of the cerci.

Habitat.—Eastern Siberia (Kamchatka).

Holotype, male, Volcano Kluchevskoi, Kyrgurich, altitude 3,000 to 4,000 feet, June 12, 1909 (*Dershavin*), No. 394. Allotype, female, Kljuhevskoje Village, altitude 3,000 feet, July 4, 1909 (*Dershavin*), No. 360. Paratypes, 1 female, with allotype, June 10, 1909, No. 355; 1 female, Petropavlovsk, June 1, 1908 (*Dershavin*), No. 367.

The present fly bears a superficial resemblance to *Tipula* (*Vestiplex*) *kamchatkana* sp. nov., with which it was associated in collections. It is a very different fly and seems to be more correctly placed in *Arctotipula*, the margins of the cerci being smooth.

TIPULA (LUNATIPULA) POLYPOGON sp. nov. Plate 1, fig. 11; Plate 3, figs. 39, 40.

General coloration grayish yellow, the median præscutal stripe a little darker, bordered laterally by brown; antennæ (male) relatively short, flagellum dark brown; wings yellowish gray, unmarked except for stigma; cell 1st M_2 relatively small; outer abdominal segments blackened; male hypopygium large, unusually complicated by tufts and brushes of yellow setæ, especially on eighth sternite.

Male.—Length, about 15 millimeters; wing, 18; antenna, 4.5.

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

Frontal prolongation moderately long, yellow; nasus short and stout; basal segment of palpus yellowish brown, the remaining segments brownish black. Antennæ (male) relatively short, if bent backward extending about to the wing root; scape and pedicel yellow, flagellum dark brown; basal enlargement of segments of medium size; verticils exceeding the segments; terminal segment about one-half the penultimate. Head buffy yellow.

Mesonotum obscure yellow or grayish yellow, with a poorly indicated, more brownish yellow, median stripe that is best indicated by the narrow brown margins; lateral stripes obsolete; scutum yellowish gray, the centers of lobes somewhat darker; posterior sclerites of mesonotum more buffy. Pleura buffy yellow, the dorsopleural membrane somewhat clearer. Halteres pale, the knobs darkened. Legs with the coxæ pale yellow; trochanters yellow; femora yellow, the tips narrowly and weakly darkened; tibiæ and tarsi brownish yellow, the outer tarsal segments more darkened. Wings (Plate 1, fig. 11) yellowish gray; prearcular and costal regions clearer yellow; stigma brown; obliterative areas at cord conspicuous; veins brown. Venation: R_{1+2} entire; cell 1st M_2 small; M_{3+4} about one-half the basal section of M_3 .

Abdomen with the basal segments yellow, narrowly trivittate with brown, the sublateral stripes more distinct than the median one; segments eight and nine blackened. In the female, the three tergal stripes are broader and more distinct, especially on outer segments. Male hypopygium (Plate 3, fig. 39) large; tergite, 9t, entirely separated from sternite, 9s, by wide mem-

brane; basistyle large but incomplete, separated from sternite by a deep, membranous, ventral suture and a longer but fainter dorsal impressed line. Ninth tergite (Plate 3, fig. 39, 9t) of moderate size, gently narrowed outwardly, the caudal margin with a U-shaped notch; sublateral lobes obtuse, near apex with a small, slender protuberance that is directed ventrad and mesad; on ventral face of tergite, in longitudinal alignment with the above, a second pair of similar darkened lobules. Outer dististyle (Plate 3, fig. 40, od) broadly spatulate. Inner dististyle, *id*, with a conspicuous caudal or outer arm, the apex of which is truncated, the outer margin of both arms of style fringed with long setæ. Ninth sternite, at junction with basistyle, with a pendulous lobe that is densely clothed with long yellow setæ; cephalad of this, a conspicuous armature of chitinized hooks, as shown. Eighth sternite (Plate 3, fig. 40, 8s) unusually complicated by lobes and setal brushes; median region with a deep emargination filled with membrane, bearing two pairs of lobes: A larger, more caudal pair, before apex with a powerful reddish spine decussate at midline with its mate of the opposite side; inner face of this lobe with abundant long yellow setæ that extend the entire length of lobe, the more basal ones coarser; the more cephalic pair of sternal lobes lie closer to the midline, each with a long brush of yellow setæ that are directed ventrad. Ovipositor with cerci long and slender, straight.

Habitat.—Eastern Siberia (Kamchatka).

Holotype, male, Kljuchevskoje Village, 160° 20' east longitude, 56° 40' north latitude, June 2, 1909 (*Dershavin*), No. 364. Allotopotype, female, July 6, 1909, 363. Paratopotype, male, June 15, 1909, No. 366.

The present fly is very distinct from other regional members of the subgenus. It is allied to European species such as *Tipula peliostigma* Schummel, *T. selene* Meigen, and others, but is well-distinguished by the size and structure of the male hypopygium.

TIPULA (LUNATIPULA) LAMENTARIA sp. nov. Plate 1, fig. 12; Plate 3, figs. 41, 42.

General coloration gray and yellow, the præscutum with more brownish gray stripes that are poorly delimited; basal three antennal segments yellow, the remainder chiefly brownish black; wings pale brown, sparsely variegated by darker brown and whitish; petiole of cell M_1 short, cell 1st M_2 long; male hypopygium with the tergite large, the median region entirely pale, membranous; each lateral lobe flattened, divergent; a single dististyle; a conspicuous fleshy lobe extends caudad from the pos-

terior portion of the basistyle; eighth sternite with a terminal brush of yellow setæ.

Male.—Length, about 13 millimeters; wing, 15.5; antenna, 4.5.

Frontal prolongation of head testaceous-yellow; nasus slender; palpi brownish black. Antennæ (male) of moderate length, if bent backward extending about to mid-distance between the bases of wings and halteres; basal three segments of antennæ light yellow; remainder of organ almost uniformly brownish black, the basal enlargements a little darker; verticils very long, exceeding the segments. Head gray.

Mesonotal præscutum gray, with darker, more brownish gray stripes that are very poorly defined; scutal lobes variegated by darker; scutellum brown; mediotergite testaceous-yellow. Pleura brownish yellow, the dorsopleural region clearer yellow; ventral sternopleurite weakly darkened. Halteres pale yellow, the knobs infuscated. Legs with the coxæ whitish yellow; trochanters yellow; femora light yellow, the tips narrowly but conspicuously blackened; tibiæ pale brown, the tips darker; tarsi pale brown, the outer segments darker brown. Wings (Plate 1, fig. 12) with the ground color pale brown; prearcular and costal regions light yellow; stigma small, pale brown, confluent with a cloud on anterior cord; small but conspicuous oblitative areas before stigma and across cell 1st M_2 ; veins brown, paler in the yellow areas. Macrotrichia of veins beyond cord relatively numerous, lacking on distal half of R_{1+2} . Venation: R_{1+2} entire; cell M_1 with petiole short, varying in length from about one-half m to sessile; cell 1st M_2 long, parallel-sided; M_{3+4} short, less than one-third the basal section of M_3 , the fork thus lying proximad of $r-m$.

Abdomen more or less discolored in type, apparently dark reddish brown, the outer segments still more darkened. Male hypopygium (Plate 3, fig. 41) with the tergite, $9t$, entirely separate from the sternite, $9s$, by membrane; basistyle very small, entirely cut off by sutures; at point of union of sternite and basistyle is a stout cylindrical lobe, directed caudad, pale in color, provided with long conspicuous setæ. Ninth tergite (Plate 3, fig. 42, $9t$) large, each half entirely divided by pale membrane, the lateral lobes appearing as broad, flattened, divergent blades that gradually narrow to the subacute tips; median-caudal portion of tergite a little produced, the margin obtuse. A single dististyle (Plate 3, fig. 41, d), compressed, the

posterior margin coarsely and irregularly denticulate; surface of style with scattered setæ, those at point of attachment of basistyle very abundant and delicate. Eighth sternite (Plate 3, fig. 41, 8s) moderately sheathing, narrowed outwardly, the apex gently notched and provided with a brush of long yellow setæ. Ædeagus (Plate 3, fig. 42, a) elongate, blackened, the apex terminating in two acute black spines.

Habitat.—Eastern Siberia (Ussuri).

Holotype, male, between Chhil and Wakar, Amur River, July 29, 1908 (*Soldatov*), No. 661.

The general appearance of the present fly is somewhat like the Nearctic *Tipula mainensis* Alexander, but the two species are very distinct. The broad membranous median strip of the tergite of the hypopygium is similar to that found in many *Vestiplex* species. In certain structures, the fly suggests some European species of *Lunatipula*, as *pekiostigma* Schummel and *selene* Meigen, but the resemblance is not particularly close.

TIPULA (LUNATIPULA) LUNDSTRÖMIANA sp. nov. Plate 1, fig. 13; Plate 4, figs. 43, 44, 45.

Belongs to the *serta* group; nasus lacking; general coloration gray, the præscutum with four brown stripes; antennæ (male) long, the flagellar segments strongly incised; male hypopygium with the caudal margin of sternite produced medially into a depressed plate that is further extended into two long straight spines.

Male.—Length, about 16 millimeters; wing, 16; antenna, about 6.5.

Female.—Length, 22 to 23 millimeters; wing, 19 to 20.

Frontal prolongation of head elongate, without nasus, brownish gray above, brighter laterally beneath; palpi brownish black. Antennæ of male (Plate 4, fig. 43) long, if bent backward extending to shortly beyond base of abdomen; scape and pedicel yellow, flagellum black; flagellar segments very strongly incised, about as in *excisa*. Head light gray, with a capillary blackish line on posterior vertex.

Mesonotal præscutum light gray, with four brown stripes; scutum light gray, the lobes variegated with darker gray; posterior sclerites of notum gray, the mediotergite with a median dusky vitta. Pleura gray, the dorsopleural region light yellow; mesopleura glabrous. Halteres yellow, the knobs dark brown. Legs with the coxæ light gray; trochanters yellow; femora yellow, the tips narrowly and gradually infuscated; tibiæ yellowish brown, darkened outwardly; tarsi black. Wings (Plate 1, fig.

13) brownish, the prearcular and costal regions more yellowish; stigma dark brown; anterior cord clouded with brown; an incomplete whitish crossband beyond stigma, extending to cell 1st M_2 (male) or into base of M_3 (female); a whitish spot near outer end of cell M , small in male, larger and more conspicuous in female; veins brown. Macrotrichia of veins beyond cord numerous and well-distributed; squama naked. Venation:

$1+2$ entire, with trichia to tip or nearly so; cell 1st M_2 long, narrowed at outer end; M_{3+4} varying from very short, about one-half m , to fully as long as this element.

Abdomen with the first tergite brown, the succeeding segments yellow, the tergites weakly darkened medially, much more strongly so in female; indications of a less clearly defined sublateral stripe; lateral margins narrowly pale; outer segments infuscated; sternites of female darkened and pruinose. Male hypopygium (Plate 4, fig. 44) with the tergite, $9t$, separate from sternite, $9s$; basistyle, b , very large, entirely separate, the caudal end narrowed but scarcely produced. Ninth tergite (Plate 4, fig. 45, $9t$) subquadrate, transverse; caudal margin with five projections, including a nearly lateral pair of slender flattened blades, their tips obtuse; a shorter and broader median black lobe, and a pair of small acute teeth between the other projections; dorsomedian region of tergite narrowly impressed, without setæ; lateral lobes, viewed from side, with a ventral expansion near base. Outer dististyle, od , cylindrical, slender, with abundant coarse setæ. Inner dististyle (Plate 4, fig. 45, id) tridentate at apex. Region of junction of ninth sternite and basistyle (Plate 4, fig. 44, $9s$) with a long pale fleshy lobe directed ventrad and mesad, the narrowed tips contiguous on the midline. Eighth sternite (Plate 4, fig. 45, $8s$) with the caudal margin transverse or nearly so, the only armature being a conspicuous median depressed plate that narrows outwardly, terminating in two acute straight spines that inclose a deep, parallel-sided U-shaped notch. As in the similar bidentate lobe of *serta*, there is some variation in size and shape of the plate in different individuals.

Habitat.—Eastern Siberia (Amur, Saghalien).

Holotype, male, Beitonovo Station, Amur River, May 31, 1915 (*Popoff*), No. 630. Allotopotype, female, No. 631. Paratypes, 1 teneral male, Osernaja, Amur River, June 10, 1913, No. 664; 1 male, Saghalien (*Suprunenko*), No. 526; 1 female, Amur (*Suprunenko*), No. 529.

I dedicate this distinct species to the memory of the late Carl Lundström, distinguished authority on the Nematocera of Finland and Arctic Asia. The closest allies are *T. subexcisa* Lundström, of northern Europe, and *T. sertā* Loew, of northern North America; from the former it is readily told by the armature of the eighth sternite of the male hypopygium, where the small, widely separated fleshy lateral lobes of *subexcisa* are replaced by the median bidentate plate described; *sertā*, while very different from the present species in its general appearance, especially the wing pattern, approaches it in the structure of the male hypopygium, the general features being very similar in the two flies. The bidentate sternal plate is smaller in *sertā*, but has nearly the same conformation. I believe that the members of the *sertā* group are correctly placed in *Lunatipula* despite the conspicuous lack of a nasus.

TIPULA (LUNATIPULA) FLACCIDA sp. nov. Plate 1, fig. 14; Plate 4, figs. 47, 48.

Belongs to the *sertā* group; general coloration of mesonotum light gray, with four slightly darker gray stripes; antennæ (male) relatively long, the flagellar segments only feebly incised; femora yellow, the tips narrowly dark brown; wings grayish, with a restricted whitish and dark brown pattern; male hypopygium with a small obtuse median lobe between the slender lateral arms of tergite; eighth sternite with a horn-shaped lobe on either side, these gradually narrowed to the tips.

Male.—Length, about 16 millimeters; wing, 17.5; antenna, about 6.

Frontal prolongation of head long and conspicuous, brown, sparsely pruinose dorsally, more yellowish ventrally beneath; nasus lacking; palpi with basal segment yellow, succeeding segments pale brown, the terminal segment passing into brownish black. Antennæ (Plate 4, fig. 46) relatively long; basal three segments yellow, the remainder brownish black; flagellar segments only feebly incised; longest verticils about equal to the segments. Head light gray, with a faintly indicated median dusky vitta.

Mesonotal præscutum light gray, with four scarcely indicated darker gray stripes, the intermediate pair separated by a darker vitta; scutum light gray, the lobes indistinctly variegated by darker gray; posterior sclerites of notum gray. Pleura light gray, with large darker gray areas on ventral anepisternum, ventral sternopleurite, and meron; dorsopleural region yellow. Halteres yellow, the knobs dark brown. Legs with the coxæ gray; trochanters yellow; femora yellow, the tips narrowly dark

brown, the amount subequal on all legs and not exceeding the distal seventh or eighth; tibiæ and tarsi brown, the outer tarsal segments blackened. Wings (Plate 1, fig. 14) grayish, with a restricted whitish and dark brown pattern that is arranged much as in *sublimitata*; post-stigmal whitening restricted, including cells Sc_2 and R_2 ; oblitative streak along cord more extensive and conspicuous, involving the base of cell M_3 ; stigma dark brown; narrow brown seams on anterior and posterior cords; veins brown. Macrotrichia of veins numerous. Venation: Second section of R_1 slightly shorter than free tip of Sc_2 .

Abdomen yellow, the tergites trivittate with brown, the areas extensive but not well-delimited; terminal segments and hypopygium uniformly blackened. Male hypopygium (Plate 4, fig. 47) of moderate size, the tergite, $9t$, and basistyle, b , entirely cut off from sternite, $9s$, by deep, membranous sutures. Ninth tergite (Plate 4, fig. 47, $9t$) narrowed outwardly, the caudal margin conspicuously emarginate; lateral lobes narrowed into slender blackened blades, their tips truncated; at base of emargination a small obtuse blackened lobe. Basistyle with a group of long scattered setæ. Outer dististyle small, cylindrical. Inner dististyle (Plate 4, fig. 48, *id*) with a conspicuous digitiform lobe at base. Junction of sternite and basistyle with a blackened lobe that is directed ventrad, provided with sparse scattered yellow setæ. Eighth sternite (Plate 4, fig. 48, $8s$) having the surface with small delicate setæ only; caudal margin with a broad notch filled with membrane; a horn-shaped lobe at each lateral angle of emargination, each narrowed to a subacute point, the mesal surface with a few, scattered, coarse, yellow setæ.

Habitat.—Eastern Siberia (Ussuri).

Holotype, male, Volok Bay, Vladivostok, August 4, 1912 (*Czerski*), No. 727.

The nearest ally is *Tipula* (*Lunatipula*) *sublimitata* Alexander, of Kamchatka,⁴ which differs chiefly in the structure of the male hypopygium, especially the tergite and eighth sternite. In the latter species, the lateral lobes of the sternite are broad-based with the tips blunt and expanded.

TIPULA (LUNATIPULA) DERSHAVINI sp. nov. Plate 1, fig. 15; Plate 4, fig. 49.

Allied to *senega*; general coloration of mesonotum olive-gray, the præscutum with four ill-defined darker gray stripes; antennæ with three basal segments yellow, the remainder chiefly brownish black; wings with a faint brown tinge, an incomplete

⁴ Arkiv för Zoologi 19A, No. 9 (1927) 8-10, figs. 4, 5.

whitish crossband beyond cord; male hypopygium with the tergite notched, produced medially into an obtuse triangular lobe; eighth sternite produced medially into a flattened plate, the apex notched, the ventral margins toothed.

Male.—Length, about 14 millimeters; wing, 15; antenna, about 4.5.

Female.—Length, about 20 millimeters; wing, 18.5.

Frontal prolongation of head obscure yellow; nasus conspicuous; palpi dark brown, the basal segment obscure yellow. Antennæ with the basal three segments yellow, the remainder nearly uniform brownish black, the basal enlargements a little darker; flagellar segments moderately incised; verticils nearly as long as the segments; terminal segment small, thimble-shaped. Head olive-gray, the midline of posterior vertex a little darkened.

Mesonotal præscutum olive-gray, with four darker brownish gray stripes that are ill-defined against the ground, the mesal edges of anterior ends of intermediate stripes a little darker; scutum greenish gray, the lobes variegated with darker; posterior sclerites of notum chiefly gray. Pleura whitish, the ventral anepisternum and ventral sternopleurite light gray; dorso-pleural membrane buffy; pleura glabrous. Halteres yellow, the knobs infuscated. Legs with the coxæ obscure whitish; trochanters yellow; femora obscure yellow, the narrow tips weakly and very indistinctly darkened; tibiæ brownish yellow; tarsi passing into brownish black. Wings (Plate 1, fig. 15) with a faint brown tinge; prearcular and costal regions clearer yellow; stigma and a narrow brown seam on anterior cord pale brown; an incomplete whitish crossband beyond cord, extending from costa to cell 1st M_2 , narrowed behind; whitish oblitative areas before stigma and across cell 1st M_2 ; veins brown. Macrotrichia on veins beyond cord sparse but well-distributed; squama without well-developed setæ. Venation: R_{1+2} entire; M_{3+4} short, less than m .

Abdominal tergites obscure brownish yellow, with a broad diffuse brownish median stripe and narrow, interrupted, sublateral, brown stripes; lateral borders of segments broadly grayish white; sternites yellow, the outer segments more darkened. Male hypopygium (Plate 4, fig. 49) with the tergite, $9t$, separate from sternite, $9s$; basistyle relatively large, almost completely separated from sternite, fused for a short distance near the ventral suture. Ninth tergite, $9t$, of the general type of *senega*

or *serta*; lateral lobes relatively slender; median area conspicuously produced into a blunt triangular point. From the membrane at end of ventral suture of basistyle hangs pendant a large pale fleshy lobe that is clothed with abundant pale setæ. Basistyle with outer end narrowed to an obtuse point. Outer dististyle very small, cylindrical, with conspicuous setæ. Inner dististyle, *id*, massive. Phallosome, *p*, trifid, the median lobe microscopically bifid at apex. Eighth sternite, 8s, with the caudal margin complexly armed; lateral lobes with margins feebly sclerotized, directed mesad, touching one another at midline, clothed with relatively conspicuous setæ; median region of sternite produced caudad into a flattened chitinized blade, depressed, the apex with a U-shaped notch, the ventral margins (as viewed laterally) thickened and set with about three conspicuous teeth; at base of median plate, just cephalad of the lateral lobes, a small acute point that is directed strongly caudad.

Habitat.—Eastern Siberia (Kamchatka, Ussuri).

Holotype, male, Kljuchevskoje Village, Kamchatka, 160° 20' east longitude, 56° 40' north latitude, July 5, 1909 (*Dershavin*), No. 358. Allotype, female, Suchan district, Trolovka, Ussuri, July 6, 1926 (*Mordvilko*), No. 619. Paratopotype, female, with type, No. 356.

The present fly is undoubtedly allied to the Nearctic *Tipula senega* Alexander, despite the somewhat different wing pattern. The peculiar conformation of the ninth tergite and eighth sternite of the male hypopygium are very suggestive of the same structures in *senega*, but the details are quite distinct. The superficial appearance is much as in the Japanese *Tipula pendula* Alexander, but the hypopygium of the latter is entirely different. The paratype may not be conspecific with the type, as the white band beyond cord of wings is not defined and the tips of the femora are narrowly darkened.

TIPULA (LUNATIPULA) LÆTIBASIS sp. nov. Plate 1, fig. 16; Plate 4, figs. 50, 51.

Allied to *sachalinensis*; general coloration gray, the mesonotal præscutum with four darker gray stripes, the intermediate pair narrowly separated and without further median darkening; wing base conspicuously light yellow; male hypopygium with the caudal margin of tergite broadly emarginate, without denticles except a single outer point on each lobe; inner dististyle with the heel portion dusky, terminating in several small spines.

Male.—Length, about 13 to 14 millimeters; wing, 12 to 12.5.

Female.—Length, 18 to 22 millimeters; wing, 13.5 to 16.5.

Generally similar and closely allied to *Tipula sachalinensis* Alexander, differing especially in the coloration of the mesonotal præscutum and in the structure of the male hypopygium.

Coloration bluish gray, the head with a median darker line. Mesonotal præscutum with four dark stripes, the intermediate pair clearly but narrowly separated and without indications of a further capillary median vitta, as in *sachalinensis*; lateral margins of præscutum undarkened. Femoral tips conspicuously blackened, somewhat more broadly so in the Honshu paratype. Wings (Plate 1, fig. 16) with the prearcular cells conspicuously light yellow in both sexes; dark pattern highly contrasted, especially in female. Abdomen with caudal margins of outer segments conspicuously ringed with yellow, the lateral margins of tergites more buffy; abdomen with a heavy light gray bloom. Male hypopygium in essentials much as in *sachalinensis*, as in the notched ninth tergite, complete basistyle, and armed eighth sternite. Ninth tergite (Plate 4, fig. 50, 9t) with the caudal margin gently emarginate to form a large U-shaped notch, the base of which has a further quadrate incision that bears a tiny median tooth at base; no denticles along caudal border of tergite; dorsal surface back from median incision with a depressed groove. Outer dististyle cylindrical. Inner dististyle, *id*, much as in *sachalinensis*, but the heellike portion is borne on side of sclerite, appearing as a dusky plate having each outer angle with about three coarse teeth. Junction of ninth sternite and basistyle on either side with a small lobe that is suddenly narrowed outwardly, the apex tufted, 9s. Eighth sternite with the caudal margin emarginate, filled with pale membrane; each lateral angle bears a pencil of long setæ, mesad of which are smaller setæ.

In *Tipula sachalinensis* the tergite (Plate 4, fig. 51, 9t) has the caudal margin transverse or even slightly convex, with a deep median notch, the lateral lobes thus formed truncate, with small spinous points. Inner dististyle, *id*, with the heel portion projecting as a subrectangular yellow lobe, its apex truncated, the surface with delicate microscopic setulæ, but without spines of any sort. Lobes of the ninth sternite longer, more evenly cylindrical, with long conspicuous setæ.

Habitat.—Eastern Siberia, Japan.

Holotype, male, Bay De Castries, Ussuri, June 19, 1910 (*Derbeck*), No. 318. Allotype, female, River Kamchatka, Kamchatka, 1898 (*Gondatti*), No. 590. Paratypes, 1 female, Dshalinda,

Reinovo, Amur, June 9 to 30, 1915 (*Poroff*), No. 624; 1 female, Ichinosawa, Saghalien, July 9, 1924 (*M. Tamanuki*); 1 female, Norikuradake, Japanese Alps, Honshiu, Japan, July 26, 1929 (*Machida*).

The only fly that can be confused with *Tipula* (*Lunatipula*) *lætibasis* is *T. (L.) sachalinensis* Alexander, which has been sufficiently compared in the above description. The Japanese paratype had earlier⁵ been recorded as *sachalinensis*, but the discovery of the male sex has shown the present fly to be quite distinct.

TIPULA (LUNATIPULA) GONDATTII sp. nov. Plate 1, fig. 17; Plate 4, figs. 52, 53.

Allied to *trispinosa*; mesonotum light gray, the præscutum with four, scarcely evident, darker gray stripes; wings with the ground color yellowish gray, stigma pale brown; male hypopygium with the outer lateral angles of tergite produced into slender blackened horns; outer dististyle very small.

Male.—Length, about 11 to 13 millimeters; wing, 12.5 to 14; antenna, about 4.

Female.—Length, about 12 millimeters; wing, 12.

Frontal prolongation of head relatively long, gray; nasus lacking; palpi brown, the incisures pale. Antennæ with the scape infuscated; pedicel light yellow; flagellum black; segments with basal enlargement moderately developed, the verticils a trifle shorter than the segments. Head gray.

Mesonotal præscutum light gray, with four scarcely apparent darker gray stripes, the lateral pair especially indistinct; posterior sclerites of notum gray, the scutellum a little more yellowish. Pleura gray, the posterior sclerites paler; dorsopleural region yellow. Halteres yellow, the knobs infuscated. Legs with the coxæ light gray; trochanters yellow; femora yellow, the tips conspicuously blackened, the amount subequal on all legs, including approximately the distal sixth or less; tibiæ and tarsi light brown, the terminal tarsal segments darker brown. Wings (Plate 1, fig. 17) yellowish gray, the prearcular and costal regions light yellow; stigma pale brown; oblitative streak before cord relatively conspicuous, extending into base of cell M_3 ; veins pale brown, more yellowish in the brightened areas. Macrotrichia well distributed on veins beyond cord. Venation: R_{1+2} entire; cell 1st M_2 of moderate size for a member of the group.

Abdominal tergites reddish yellow, on the fourth and succeeding segments more blackish gray, with broad pale lateral mar-

⁵ Philip. Journ. Sci. 44 (1931) 339.

gins; sternites beyond the second blackish gray; hypopygium black. Male hypopygium (Plate 4, fig. 52) with the tergite, 9*t*, and basistyle entirely distinct from sternite, the latter small. Ninth tergite (Plate 4, fig. 52, 9*t*) large, black, with a profound spade-shaped median incision, the lateral arms narrowed into slender, gradually diverging lobes, the cephalic sclerotized bar narrow. Outer dististyle a tiny blacked lobe. Inner dististyle (Plate 4, fig. 53, *id*) relatively small, extended into a simple apical beak. Eighth sternite (Plate 4, fig. 53, 8*s*) sheathing, each outer lateral angle bearing a slender, inconspicuous lobe that is narrowed to an acute point, the surface with small setulæ. Ovipositor with small fleshy valves, as in the *fascipennis* group.

Habitat.—Eastern Siberia (Saghalien, Ussuri).

Holotype, male, Nikolajevsk, Amur River, Ussuri, June 23, 1914 (*Bjelousov*), No. 535. Allotopotype, female, No. 537. Paratopotype, 1 female, No. 536. Paratypes, 2 males, Chaivo, Saghalien, 142° east longitude, 52° north latitude, July 12, 1910 (*Derbeck*), Nos. 322, 324; 4 of both sexes, Dui, Saghalien, June 20, 1914 (*Bjelousov*), Nos. 544, 545, 547, 550.

I take pleasure in dedicating this distinct fly to Mr. Gondatti, leader of several expeditions to eastern Siberia in behalf of the Russian Academy of Sciences. The nearest ally is *Tipula* (*Lunatipula*) *trispinosa* Lundström, of Finland, which has all details of the male hypopygium quite distinct.

TIPULA (LUNATIPULA) DERBECKI sp. nov. Plate 1, fig. 18; Plate 5, fig. 54.

General coloration gray, the præscutum with four, poorly defined, darker gray stripes; antennæ (male) short, if bent backward not reaching the wing root; scape and pedicel yellow; flagellum with basal segments bicolorous; femora yellow, the tips narrowly brownish black; wings grayish brown with a restricted brown and white pattern, the former including a conspicuous spot at near midlength of cells M and Cu; a short poststigmatal white crossband; R₁₊₂ entire; male hypopygium with the ninth tergite notched medially, the lateral lobes broad; inner dististyle with caudal end produced into a long, powerful, black spine; eighth sternite moderately sheathing, terminating in two small, fleshy, pendant lobes.

Male.—Length, about 13.5 millimeters; wing, 15; antenna, about 3.

Frontal prolongation of head black, sparsely pruinose; nasus long and slender; palpi black. Antennæ (male) relatively short, if bent backward ending some distance before wing root; scape

and pedicel yellow; basal flagellar segments bicolorous, black basally, reddish brown apically, the outer segments more uniformly blackened; longest verticils nearly equal in length to segments. Head gray pruinose, discolored in type.

Mesonotum gray, the præscutum with poorly defined darker gray stripes; scutal lobes similarly marked with dark gray; scutellum dark gray; mediotergite light gray. Pleura gray; dorsopleural region buffy. Halteres pale yellow, knobs dark brown. Legs with the coxæ light gray; trochanters yellow; femora yellow, the tips narrowly brownish black; tibiæ yellow, the tips narrowly darkened; tarsi obscure yellowish brown at base, passing into black; forelegs broken. Wings (Plate 1, fig. 18) with the ground color grayish brown, with a restricted brown and whitish pattern; the brown areas include the stigma and a confluent area on anterior cord; a small spot at origin of R_s ; a large paler brown cloud at midlength of cells M and Cu , preceded and followed by more-whitish areas; a restricted whitish mark beyond stigma, extending from costa to cell R_5 , becoming more obscure behind; axilla narrowly darkened; veins brown. Macrotrichia of veins very numerous, lacking on 1st A , with exception of a single trichium at outer end; squama naked. Venation: R_{1+2} pale, entire, diverging strongly from R_3 , cell R_2 relatively small; M_{3+4} about two-thirds the basal section of M_3 .

Abdomen with basal tergite gray; tergites two and three yellow, narrowly trivittate with brown, on the outer segments becoming more extensive so as to include virtually the whole segment; lateral borders of tergites pale; basal sternites yellow, the outer segments dark brownish gray. Male hypopygium (Plate 5, fig. 54) with the tergite, $9t$, entirely separate from the sternite, $9s$, by extensive pale membrane. Basistyle, b , very large, the suture separating it from sternite delicate but complete. Ninth tergite, $9t$, broad, darkened but not heavily sclerotized, the main body massive, the caudal margin extended into a paler portion that bears a U-shaped median notch; lateral lobes very broad, obliquely truncated; mid-dorsal area of tergite depressed, without setæ. Outer dististyle, od , pale, long, and slender, still paler and more or less constricted at midlength, the apex narrowed. Inner dististyle, id , elongate, parallel-sided or even a little dilated outwardly, the ventral or caudal end produced into a powerful smooth black spine, its apex acute. Eighth sternite sheathing, the apex at midline with two small pale lobes that are pendant or recurved.

Habitat.—Eastern Siberia (Amur).

Holotype, male, Cape Dshaore, mouth of Amur River, 141° 15' east longitude, 53° north latitude, June 19, 1910 (*Derbeck*), No. 312.

This very interesting *Tipula* is dedicated to the collector of this and other noteworthy crane flies from Amur and Saghalien. The peculiar structure of the male hypopygium, especially of the inner dististyle, readily separates the present fly from allied similar forms. The spinous extension of the inner dististyle suggests *Tipula apicispina* Alexander (Ussuri), which is in all other respects a very different fly.

TIPULA (LUNATIPULA) CHERNAVINI sp. nov. Plate 1, fig. 19.

General coloration gray, the præscutum with four dark brown stripes; antennæ black, the basal three segments yellow, the proximal end of scape a little darkened; femora obscure yellow, the tips rather narrowly brownish black; wings handsomely variegated with light and dark brown, together with extensive whitish areas, the latter including a complete crossband beyond cord; R_{1+2} entire; cell M_1 unusually deep, sessile; basal abdominal tergites reddish yellow, with three brown stripes; basal sternites dark gray.

Female.—Length, about 20 millimeters; wing, 18.5.

Frontal prolongation of head light gray above, the ventral half beneath brownish black; nasus elongate, stout; palpi black. Antennæ with the basal three segments yellow, the proximal end of scape a little infuscated, the first flagellar segment a little more darkened than the pedicel; remainder of antennæ black; longest verticils exceeding segments; terminal segment nearly two-thirds the penultimate. Head light gray.

Mesonotal præscutum light gray with four dark brown stripes, the intermediate pair narrow and more intense in color than the laterals; scutal lobes variegated with dark brown; posterior sclerites of notum gray, the mediotergite with a capillary dark line. Pleura gray, the dorsopleural region more buffy. Halteres broken. Legs with the coxæ light gray; trochanters yellow; femora obscure yellow, the tips rather narrowly brownish black; tibiæ light brown, the tips narrowly blackened; tarsi light brown at bases, passing into black. Wings (Plate 1, fig. 19) with the ground color relatively dark brown, highly variegated with whitish and darker brown; prearcular and costal regions yellow; stigma dark brown, confluent with a similar area on anterior cord; dark spot at origin of Rs small; the extensive

white areas are as follows: A broad complete crossband beyond cord; extensive areas in cells R_1 , outer end of cell R, the latter confluent with a similar but smaller area in outer end of cell M; a large basal whitening, involving cells R to 1st A, inclusive; bases of anal cells pale; veins brown, light yellow in the whitish areas. Macrotrichia of veins beyond cord relatively numerous and well-distributed; squama naked. Venation: R_{1+2} entire but very pale beyond base; cell M_1 sessile; M_{3+4} less than one-half the basal section of M_3 ; m-cu on M_4 shortly beyond origin.

Abdomen destroyed beyond midlength; basal tergite and proximal ring of tergite two dark gray; succeeding tergites reddish yellow, the median region dark brown; on third and succeeding tergites a conspicuous sublateral stripe begins; basal four sternites dark gray, with only the base of second narrowly yellow; segments beyond fourth broken.

Habitat.—Eastern Siberia (Amur).

Holotype, female, Osernaja, mouth of Amur River, $160^{\circ} 30'$ east longitude, 57° north latitude, June 20 and 21, 1915 (*Chernavin*), No. 713.

This interesting crane fly is named in honor of the collector, who has taken rather numerous species of these flies at the mouth of the Amur. The fly belongs to a group of forms having vein R_{1+2} entire and with a broad, complete white crossband beyond the cord. From all regional members of this restricted group, it differs in the sessile cell M_1 . The closest relative appears to be *Tipula (Lunatipula) mesacantha* sp. nov., which has cell M_1 conspicuously petiolate, and, in the male sex, at least, has the basal abdominal sternites brightened. The possibility exists that the present fly is the opposite sex of *mesacantha*.

TIPULA (LUNATIPULA) MESACANTHA sp. nov. Plate 1, fig. 20; Plate 5, figs. 55, 56.

Allied to *trupheoneura*; general coloration light gray, the præscutum with four more or less distinct brown stripes; antennæ with scape and pedicel yellow, flagellum black; wings pale brown, variegated by darker brown and whitish areas, the latter including a complete crossband beyond cord; tip of R_{1+2} pale or atrophied; male hypopygium with the lateral lobes of tergite flattened, pale, the margins irregularly toothed; median notch of tergite with a long acute spine; dorsocaudal region of ninth sternite on either side bearing two conspicuous spines of unequal sizes.

Male.—Length, about 13 to 14 millimeters; wing, 14.5 to 16; antenna, about 4 to 4.2.

Frontal prolongation of head obscure yellow, slightly pruinose above, more heavily so at base; nasus short and stout; palpi black. Antennæ with the scape and pedicel light yellow; first flagellar segment obscure yellow at base, the outer end infuscated; remainder of flagellum almost uniformly brownish black; flagellar segments moderately incised; longest verticils nearly equal in length to segments; terminal segment a mere button. Head light gray, with a median brown line, more distinct on posterior vertex; vertical tubercle relatively large.

Mesonotal præscutum light gray, with four narrow brown stripes, these subobsolete in the paratype; scutum light gray, each lobe with two conspicuous brown areas, subobsolete in paratype; scutellum brownish gray; mediotergite gray with a capillary blackish median vitta. Pleura light gray, the dorso-pleural region light yellow; no setæ on mesepisternum. Halteres pale yellow, the knobs dark brown. Legs with the coxæ light gray; trochanters yellow; femora yellow, the tips brownish black, the amount subequal on all legs; tibiæ reddish brown, not or scarcely darker at tips; tarsi brown to dark brown; tibial spur formula 1-2-2; claws small, simple. Wings (Plate 1, fig. 20) pale brown, variegated by darker brown areas and very extensive whitish markings; the dark areas include the stigma and a confluent mark on anterior cord, together with a small brown spot at origin of Rs; the whitish areas include a complete crossband beyond cord, with very extensive pale areas in cells R_1 , R, M, and Cu, restricting the ground almost entirely to markings in outer half of cell M; anal cells whitened basally and at near midlength of cell 1st A; prearcular and costal regions light yellow; veins brown, becoming yellowish where traversing the pale markings. Squama naked. Venation: Extreme tip of R_{1+2} very faint (in type) to entirely atrophied (in paratype), the distal two-thirds without trichia; m-cu on M_4 beyond origin.

Basal abdominal tergites reddish, with a median dark brown vitta; lateral borders narrowly gray, bordered internally by a scarcely evident dusky line; basal sternites yellow; outer abdominal segments infuscated, the hypopygium dark brown. Male hypopygium (Plate 5, fig. 55) with the tergite, 9t, entirely separate from the sternite, 9s; basistyle, b, entirely distinct from sternite, its caudal margin slightly but broadly produced. A small sclerite cut off from the dorsocaudal region of the ninth sternite is produced into a strong blackened spine, directed chiefly dorsad and caudad, with a second smaller spine near its

base, 9s. Ninth tergite (Plate 5, fig. 56, 9t) flattened, pale in color, the nearly lateral lobes thin, obliquely truncated at tips, the margin of lobes with weak pale denticles; the deep quadrate median notch bears at its base an unusually long and powerful acute spine that is approximately as long as the mesal edge of the lateral tergal lobes; on ventral surface of tergal plate, at base of each lobe and near the mesal edge, a small acute blackened spine, directed ventrad. Outer dististyle a setiferous clavate lobe. Inner dististyle with two blacked beaks, the outer margin near base produced into a small rounded lobe that bears several coarse black setæ.

Habitat.—Eastern Siberia (Amur, Ussuri).

Holotype, male, Osernaja, mouth of Amur River, June 20 and 21, 1915 (*Chernavin*), No. 715. Paratype, male, Golden Horn, Vladivostok, May 28, 1911 (*Rydzevski and Kuznetzov*), No. 426.

Tipula (*Lunatipula*) *mesacantha* is related to the Japanese *T. (L.) pollex* Alexander and *T. (L.) trupheoneura* Alexander, especially to the latter, but is quite distinct in the structure of the male hypopygium, the more conspicuous features being the ninth tergite, unarmed basistyle, and double spine of caudal margin of ninth sternite. As discussed under *T. (L.) chernavini* sp. nov., the possibility exists that this may be the male sex of that fly.

TIPULA MEDILOBATA sp. nov. Plate 1, fig. 21; Plate 5, figs. 57, 58.

Allied to *luteipennis*; general coloration of thorax gray, the præscutum with four slightly darker gray stripes that are feebly bordered by brown; male hypopygium with the tergite broadly emarginate, at base with a conspicuous median lobe that is clothed with abundant setulæ.

Male.—Length, about 13.5 to 14 millimeters; wing, 14 to 15.

Female.—Length, about 16 to 18 millimeters; wing, 15 to 16.

Frontal prolongation of head yellow; nasus distinct; basal segments of palpi yellow, outer segments broken. Antennæ with scape and pedicel yellow; flagellum broken. Head gray, the vertex medially a little darker.

Mesonotal præscutum gray, with scarcely differentiated gray stripes that are best indicated by pale brown margins; posterior sclerites of notum light gray. Pleura gray, the dorsopleural region buffy. Halteres yellow, the knobs infuscated. Legs with the coxæ light gray; trochanters yellow; femora yellow, the tips conspicuously blackened, of the tibiæ more narrowly so; tarsi passing into black. Wings (Plate 1, fig. 21) with a strong yellow tinge; stigma pale brown; oblitative streak before cord con-

spicuous; veins brown. Venation: R_{1+2} and R_3 only gradually divergent; petiole of cell M_1 short, subequal to or shorter than m .

Abdomen yellow, the basal segment pruinose; tergites with a conspicuous median brown vitta, with much narrower and less evident lateral stripes; caudal margins of segments narrowly but conspicuously pale yellow; subterminal segments more uniformly grayish brown; hypopygium extensively yellow. Male hypopygium with the caudal margin of tergite (Plate 5, fig. 57, 9t) conspicuously emarginate, the lobes relatively short, the entire emargination provided with abundant long black setæ that occur in several ranks throughout the entire extent; on ventral margin of tergite a conspicuous subrectangular lobe that is densely clothed with erect setulæ. Styli as shown. In *luteipennis* the lateral lobes of the tergite (Plate 5, fig. 58, 9t) are longer, with unusually long and dense dark setæ at apex and down the mesal edge, at base of emargination with these setæ reduced to a single row; median ventral lobe of tergite very weak and reduced, not or but little evident.

Habitat.—Eastern Siberia (Ussuri).

Holotype, male, Sidemi, August 10, 1897 (*Jankovski*), No. 482. Allotopotype, female, with type. Paratopotypes, one of each sex, with type, No. 470.

Tipula mediolobata is most readily told from the closely allied *T. luteipennis* Meigen, of Europe, by the structure of the male hypopygium. There is no darkened cloud at the end of vein 2d A of wings, as in *moiwana* (Matsumura). The subgeneric position of members of the *luteipennis* group is uncertain, but I would believe that they might be found to pertain to the typical subgenus. If a separate subgeneric group is required, the name *Platytipula* Matsumura (1916) is available.

TIPULA DOCILIS sp. nov. Plate 1, fig. 22; Plate 5, fig. 59.

Belongs to the *marmorata* group; allied to *obsoleta*; mesonotal præscutum gray, with four brown stripes; antennal scape and pedicel yellow, the flagellum black; wing pattern nearly obsolete; male hypopygium with caudal margin of tergite bearing a U-shaped notch; basistyle not apically produced; eighth sternite without noticeable armature; inner dististyle a flattened, compressed, yellow blade, with a single slender subapical blackened beak.

Male.—Length, about 12 to 13 millimeters; wing, 12 to 13.5; antenna, about 3.2.

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

Frontal prolongation of head brown; nasus conspicuous; palpi brownish black. Antennæ (male) of moderate length, if bent backward extending about to mid-distance between bases of wings and halteres; scape and pedicel yellow, flagellum black; verticils shorter than the segments. Head gray.

Mesonotal præscutum gray with four brown stripes; scutum gray, each lobe with two brown areas; posterior sclerites of notum gray, with indications of a capillary dark line. Pleura light gray; dorsopleural region yellow. Halteres yellow, the knobs dark brown with the apices a little brightened. Legs with the coxæ light gray; trochanters yellow; femora yellow, the tips narrowly dark brown, the amount subequal on all legs; tibiæ yellow, the tips very narrowly darkened; tarsi passing into black. Wings (Plate 1, fig. 22) subhyaline, the stigma pale brown; a scarcely evident darker pattern, arranged much as in *obsoleta*, most evident as a weak seam in cell M adjoining vein Cu; veins brown. Venation: R_{1+2} entire; veins M_1 and M_2 divergent, cell M_1 ample; cell 1st M_2 with cephalic face convex; M_{3+4} short.

Abdominal tergites yellow to brownish yellow, more or less darkened sublaterally; in some cases, including type, only the outer segments are darkened. Male hypopygium (Plate 5, fig. 59) relatively small in size; basistyle incomplete, its caudal portion not narrowed or produced. Ninth tergite, *9t*, with the caudal margin bearing a U-shaped notch. Outer dististyle moderately flattened. Inner dististyle, *id*, a simple compressed yellow blade, with a small acute subterminal beak. Eighth sternite, *8s*, with the caudal margin gently convex, but without any conspicuous armature of lobes or setæ; median area narrowly membranous.

Habitat.—Eastern Siberia (Kamchatka).

Holotype, male, Osernaja Village, mouth of Osernaja River, $160^{\circ} 30'$ east longitude, 57° north latitude, September 13, 1909 (*Dershavin*), No. 387. Allotopotype, a broken female, Great Javinsky, source of Osernaja River, Lake Kurilskoje, September 19, 1909, No. 402. Paratopotypes, 2 males, with types, Nos. 388, 390.

In its general appearance, the present fly is very similar to the European *Tipula obsoleta* Meigen, but is very distinct in the structure of the male hypopygium, notably the simple inner dististyle and unproduced eighth sternite.

TIPULA FIDELIS sp. nov. Plate 1, fig. 23; Plate 5, figs. 60, 61.

Belongs to the *marmorata* group, allied to *productella*; general coloration gray, the præscutum with three brown stripes, the broad median one entire; antennæ unusually long for a member of the group, if bent backward extending about to base of abdomen; wings with the pattern nearly obsolete; male hypopygium with the basistyle produced into a slender flattened lobe; eighth sternite with the caudal margin subtransverse, without lobes or hair brushes, excepting a sparse median group of long yellow setæ.

Male.—Length, about 12 millimeters; wing, 14; antenna, about 5.

Frontal prolongation of head obscure yellow, nasus distinct; palpi light brown, the outer segments darker. Antennæ (male) longer than usual in the group; scape and pedicel yellow, flagellum brownish black; verticils shorter than the segments. Head brownish gray.

Mesonotal præscutum gray, with three brown stripes, the median one darker, broad and entire; brown areas of scutal lobes poorly defined. Pleura gray, the dorsopleural membrane pale yellow. Halteres yellow, the knobs dark brown. Legs with the coxæ yellow, very sparsely dusted; trochanters yellow; femora yellow, the tips narrowly brownish black; tibiae yellow, the tips very narrowly darkened; basitarsi yellow, the tips and remainder of tarsi black. Wings (Plate 1, fig. 23) grayish subhyaline, with the usual pattern almost obsolete; stigma brown; much paler brown clouds on anterior cord; vague whitish areas beyond stigma, before cord and as a spot in outer end of cell M; veins brown. Venation: Outer medial veins not conspicuously arched or arcuated, as is common elsewhere in the group; m-cu a short distance before fork of M_{3+4} .

Abdominal tergites yellow, trivittate with brown, the lateral margins narrowly pale; on intermediate and outer segments the amount of brown increases, the outermost segments darkened; basal sternites yellow, the outer segments darker. Male hypopygium (Plate 5, fig. 60) with the basistyle, *b*, produced into a flattened blade, as in *productella*. Ninth tergite (Plate 5, fig. 61, 9*t*) with obtuse lateral lobes, the median area of tergite membranous. Inner dististyle a broadly compressed darkened blade, subcircular in outline; ventrad of this lies a flattened yellow lobe, dilated outwardly, provided with numerous setæ, some from enlarged bases. Eighth sternite (Plate 5, fig. 60) without lobes on caudal margin, the membranous median

portion nearly transverse, with a sparse brush of long yellow setæ.

Habitat.—Eastern Siberia (Jakutsk).

Holotype, male, between Ajan and Nelkan, sources of Ignitjana River, August, 1903 (*Popoff*), No. 445.

Tipula fidelis is quite distinct from the other regional members of the *marmorata* group. The unusually long antennæ of the male, presence of only three præscutal stripes, and the conspicuously produced basistyle of the male hypopygium, all readily serve to distinguish this fly. The produced basistyle is much as it is in *T. productella* Alexander (Boreal North America), but the unmodified eighth sternite and the entire median præscutal stripe are very different.

TIPULA CUPIDA sp. nov. Plate 1, fig. 24; Plate 5, figs. 62, 63.

Belongs to the *marmorata* group, allied to *vafra* and *fragilina*; male hypopygium large, the lateral angles of ninth tergite extended laterad and ventrad into slender blackened points; eighth sternite large, the caudal portion bilobed by a deep incision, the lobes conspicuously setiferous.

Male.—Length, 10.5 to 11.5 millimeters; wing, 12.5 to 13.

Frontal prolongation of head brown; nasus distinct; palpi brownish black. Antennæ with scape and pedicel yellow, flagellum black. Head light gray.

Mesonotal præscutum gray, with four brown stripes, the anterior ends of the intermediate pair suffused with gray; posterior sclerites of notum gray, each lobe of scutum conspicuously variegated with dark brown. Pleura light gray, variegated with darker gray. Legs with the coxæ light gray; trochanters yellow; femora yellow, the tips narrowly infuscated; tibiæ obscure yellow, the tips very narrowly darkened; tarsi passing into brownish black. Wings (Plate 1, fig. 24) pale brown, variegated with darker brown and white areas, the pattern arranged as in the group; stigma, a confluent seam on anterior cord, a seam along vein Cu, and a cloud at apex of latter darker brown; two slightly less intense brown areas in cell M adjoining vein Cu; the whitish areas lie before and beyond stigma, in base of cell 1st M₂, at near midlength of cell M, and in cells Cu and 1st A; veins brown. Venation: Outer medial elements conspicuously arcuated, as common in the group.

Abdomen brown, the outer segments darker brown, the caudal margins of the segments ringed with pale. Male hypopygium (Plate 5, fig. 62) relatively large and conspicuous. Ninth ter-

gite, 9t, with a broad V-shaped notch, the lateral angles extended laterad and ventrad into slender blackened points. Outer dististyle, *od*, with the blackened area at base less spinous than in *vafra*. Inner dististyle (Plate 5, fig. 63, *id*) flattened, the extreme apex of beak minutely bifid. Eighth sternite, 8s, large and sheathing, the margin with two stout lobes that are clothed with long conspicuous setæ. Gonapophyses appearing as slender, delicately setiferous blades that gradually narrow to tips.

Habitat.—Eastern Siberia (Kamchatka).

Holotype, male, foot of Volcano Shiveluch, 162° 30' east longitude, 56° 40' north latitude, August 20, 1909 (*Protopopoff*), No. 420. Paratype, male, Lake Kurilskoje, September 28, 1909 (*Dershavin*), No. 405. Expedition Rjabushinsky Brothers.

The present fly is very closely allied to *T. vafra* Riedel (northern Europe) and somewhat more distantly to *T. fragilina* Alexander (northwestern North America), differing chiefly in slight features of the male hypopygium. *Tipula vafra* is somewhat larger, with a paler wing pattern; basal flange of outer dististyle produced into a distinct blackened tooth; inner dististyle with the blade wider, the apical beak slightly longer; lobes of eighth sternite shorter and wider, appearing more flattened.

TIPULA GYNAPTERA Alexander.

Tipula gynaptera ALEXANDER, Journ. New York Ent. Soc. 24 (1918) 72-73.

The unique type, a female, was collected at Plover Bay, northeastern Siberia, July 11, 1899, by Dr. William H. Dall. A number of additional specimens from this same general region are now available and further comparisons with the nearest described ally, *Tipula whitneyi* Alexander (Pribilof Islands) may be made.

The comparisons made at the time of original definition, of larger and more protuberant eyes and somewhat more elongate antennæ in the female of *whitneyi*, hold in the present series and moreover apply to the male sex as well. The longer, more stenopterous wings of the male of the present fly are likewise conspicuously different from the wings of *whitneyi*.

Fifteen additional specimens from Uden and Markovo, Chuckchi-land, Gulf of Anadyr, 175° 30' east longitude, 64° 30' north latitude, collected in 1898 by Gondatti. One of these is described herewith as allotype.

Allotype, male, length, 11 to 12 millimeters; wing, 4 to 5.

Antennæ black throughout; flagellar segments short, strongly constricted at near midlength. Præscutum with a median dark

gray stripe that is narrowly bordered behind by more brownish, gray, the lateral stripes obsolete or nearly so. Wings reduced, stenopterous, exceeding twice the length of the halteres and much longer than the antennæ. Male hypopygium without a median tooth at base of tergal notch. Inner dististyle with the lower lobe very broad.

Allotype, male, Anadyr Region, Chuckchi-land (*Gondatti*), No. 573.

In some of the other specimens, the pedicel of the antenna is obscure yellow.

These two flies, *gynaptera* and *whitneyi*, with the wings greatly reduced in both sexes, belong to what I had earlier called the *cineracea* group, including, besides the above, five species that are fully winged in both sexes: *T. cineracea* Coquillett, *T. crawfordi* Alexander, *T. katmaiensis* Alexander, *T. kirbyana* Alexander, and *T. malaisei* Alexander, all species occurring in Boreal North America and Asia, on both sides of Bering Straits, including Alaska, Wrangel Island, and Kamchatka. All members of the group agree in their small size, conspicuous lack of a nasus, simple male hypopygium, and other characters. The only species with evidently patterned wings is *crawfordi*. The hypopygia of the various species do not appear to present many characters, the relative length of the antennæ and the degree of constriction of the flagellar segments appearing more satisfactory.

TIPULA BLASTOPTERA sp. nov. Plate 5, fig. 64.

Female with wings greatly reduced in size; general coloration brown, the præscutum depressed; frontal prolongation of head short and stout, in alignment with the anterior vertex; antennæ 12-segmented, the outer segments short and crowded; abdomen black, the valves of ovipositor elongate, smooth.

Female.—Length, about 8.5 millimeters; wing, 0.7; antenna, 1.3.

Frontal prolongation of head brownish gray, short and stout, almost as in *Nephrotoma*, the prolongation in alignment with the anterior vertex; nasus short and stout; palpi brownish black. Antennæ (Plate 5, fig. 64) short, subequal in length to head (including prolongation); scape dark brown, pedicel obscure yellow; basal flagellar segments brighter brown than the outer ones; antennæ 12-segmented, the outer four flagellar segments short and crowded; basal flagellar segments short-cylindrical, the verticils exceeding the segments. Head brownish gray.

Mesonotum dark grayish brown, without distinct stripes; præscutal interspaces indicated by small yellow setæ; præscutum depressed, scutellum large. Pleura light brown. Halteres pale, reduced in size, bent, knobs poorly developed, darkened. Wings reduced to short scales that are about as long as the fore coxæ and much shorter than antennæ; wing venation reduced, the outer radial veins best indicated by rows of strong trichia; costal trichia reduced to two or three on basal half.

Abdomen chiefly black, the caudal margins of the intermediate segments very narrowly brightened. Ovipositor with the shield chestnut black; all valves elongate, with smooth margins.

Habitat.—Eastern Siberia (Ussuri).

Holotype, female, Sitza Station, Suchan District, June 15, 1927 (*Stackelberg*), No. 738.

In the female sex, the great reduction of the wings should make the identification of this species a very simple matter. No regional species of *Tipula* is known to me in the male sex that could possibly be associated with the present fly. The short frontal prolongation of the head is much as in *Nephrotoma*. It may be fairly assumed that this region of the body would be similar in the male and, if so, the alignment of the prolongation with the remainder of the front and the anterior vertex would be very characteristic, reminding one of certain Australian Tipulinæ, allied to *Clytocosmus* Skuse. European species of *Tipula* with the wings of the female greatly reduced include *T. autumnalis* Loew, *T. carinifrons* Holmgren, *T. gimmerthali* Lackschewitz, *T. pagana* Meigen, and two species of the subgenus *Vestiplex* Bezzi, [*T. (V.) cisalpina* Riedel and *T. (V.) hemapterandra* Bezzi], in all of which the wings, although reduced, are very much larger than in the present fly and show the venation clearly but distorted. Those species with greatest wing reduction (*autumnalis*, *gimmerthali*, *pagana*) are characteristic autumnal species, while the present fly is adult in spring.

ILLUSTRATIONS

[Legend: *a*, Ædeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *id*, inner dististyle; *o*, cercus of ovipositor; *od*, outer dististyle; *p*, phallosome; *s*, sternite; *t*, tergite.]

PLATE 1

- FIG. 1. *Tipula* (*Vestiplex*) *excisoides* sp. nov., venation.
2. *Tipula* (*Vestiplex*) *kamchatkana* sp. nov., venation.
3. *Tipula* (*Vestiplex*) *pallitergata* sp. nov., venation.
4. *Tipula* (*Vestiplex*) *immunda* sp. nov., venation.
5. *Tipula* (*Vestiplex*) *transbaikalica* sp. nov., venation.
6. *Tipula* (*Vestiplex*) *tchukchi* sp. nov., venation.
7. *Tipula* (*Arctotipula*) *hirtitergata* sp. nov., venation.
8. *Tipula* (*Arctotipula*) *gavronskii* sp. nov., venation.
9. *Tipula* (*Arctotipula*) *popoffi* sp. nov., venation.
10. *Tipula* (*Arctotipula*) *tundrensis* sp. nov., venation.
11. *Tipula* (*Lunatipula*) *polypogon* sp. nov., venation.
12. *Tipula* (*Lunatipula*) *lamentaria* sp. nov., venation.
13. *Tipula* (*Lunatipula*) *lundströmiana* sp. nov., venation.
14. *Tipula* (*Lunatipula*) *flaccida* sp. nov., venation.
15. *Tipula* (*Lunatipula*) *dershavini* sp. nov., venation.
16. *Tipula* (*Lunatipula*) *lætibasis* sp. nov., venation.
17. *Tipula* (*Lunatipula*) *gondattii* sp. nov., venation.
18. *Tipula* (*Lunatipula*) *derbecki* sp. nov., venation.
19. *Tipula* (*Lunatipula*) *chernavini* sp. nov., venation.
20. *Tipula* (*Lunatipula*) *mesacantha* sp. nov., venation.
21. *Tipula* *mediolobata* sp. nov., venation.
22. *Tipula* *docilis* sp. nov., venation.
23. *Tipula* *fidelis* sp. nov., venation.
24. *Tipula* *cupida* sp. nov., venation.

PLATE 2

- FIG. 25. *Tipula* (*Vestiplex*) *excisoides* sp. nov., male hypopygium, details.
26. *Tipula* (*Vestiplex*) *excisa* Schummel, male hypopygium, details.
27. *Tipula* (*Vestiplex*) *kamchatkana* sp. nov., male hypopygium, details.
28. *Tipula* (*Vestiplex*) *pallitergata* sp. nov., male hypopygium, details.
29. *Tipula* (*Vestiplex*) *immunda* sp. nov., male hypopygium, details.
30. *Tipula* (*Vestiplex*) *transbaikalica* sp. nov., male hypopygium, details.
31. *Tipula* (*Vestiplex*) *subcentralis* Alexander, male hypopygium, details.
32. *Tipula* (*Vestiplex*) *tchukchi* sp. nov., male hypopygium, details.
33. *Tipula* (*Vestiplex*) *tchukchi* sp. nov., male hypopygium, details.

PLATE 3

- FIG. 34. *Tipula* (*Arctotipula*) *hirtitergata* sp. nov., male hypopygium, details.
35. *Tipula* (*Arctotipula*) *gavronskii* sp. nov., ovipositor.
36. *Tipula* (*Arctotipula*) *popoffi* sp. nov., ovipositor.
37. *Tipula* (*Arctotipula*) *tundrensis* sp. nov., male hypopygium, details.
38. *Tipula* (*Arctotipula*) *tundrensis* sp. nov., male hypopygium, detail.
39. *Tipula* (*Lunatipula*) *polypogon* sp. nov., male hypopygium, details.
40. *Tipula* (*Lunatipula*) *polypogon* sp. nov., male hypopygium, details.
41. *Tipula* (*Lunatipula*) *lamentaria* sp. nov., male hypopygium, details.
42. *Tipula* (*Lunatipula*) *lamentaria* sp. nov., male hypopygium, details.

PLATE 4

- FIG. 43. *Tipula* (*Lunatipula*) *lundströmiana* sp. nov., antenna, male, segments three to six.
44. *Tipula* (*Lunatipula*) *lundströmiana* sp. nov., male hypopygium, details.
45. *Tipula* (*Lunatipula*) *lundströmiana* sp. nov., male hypopygium, details.
46. *Tipula* (*Lunatipula*) *flaccida* sp. nov., antenna, male, segments three to six.
47. *Tipula* (*Lunatipula*) *flaccida* sp. nov., male hypopygium, details.
48. *Tipula* (*Lunatipula*) *flaccida* sp. nov., male hypopygium, details.
49. *Tipula* (*Lunatipula*) *dershavini* sp. nov., male hypopygium, details.
50. *Tipula* (*Lunatipula*) *lætibasis* sp. nov., male hypopygium, details.
51. *Tipula* (*Lunatipula*) *sachalinensis* Alexander, male hypopygium, details.
52. *Tipula* (*Lunatipula*) *gondattii* sp. nov., male hypopygium, details.
53. *Tipula* (*Lunatipula*) *gondattii* sp. nov., male hypopygium, details.

PLATE 5

- FIG. 54. *Tipula* (*Lunatipula*) *derbecki* sp. nov., male hypopygium details.
55. *Tipula* (*Lunatipula*) *mesacantha* sp. nov., male hypopygium, details.
56. *Tipula* (*Lunatipula*) *mesacantha* sp. nov., male hypopygium, details.
57. *Tipula* *mediolobata* sp. nov., male hypopygium, details.
58. *Tipula* *luteipennis* Meigen, male hypopygium, details.
59. *Tipula* *docilis* sp. nov., male hypopygium, details.
60. *Tipula* *fidelis* sp. nov., male hypopygium, details.
61. *Tipula* *fidelis* sp. nov., male hypopygium, details.
62. *Tipula* *cupida* sp. nov., male hypopygium, details.
63. *Tipula* *cupida* sp. nov., male hypopygium, details.
64. *Tipula* *blastoptera* sp. nov., antenna, female.

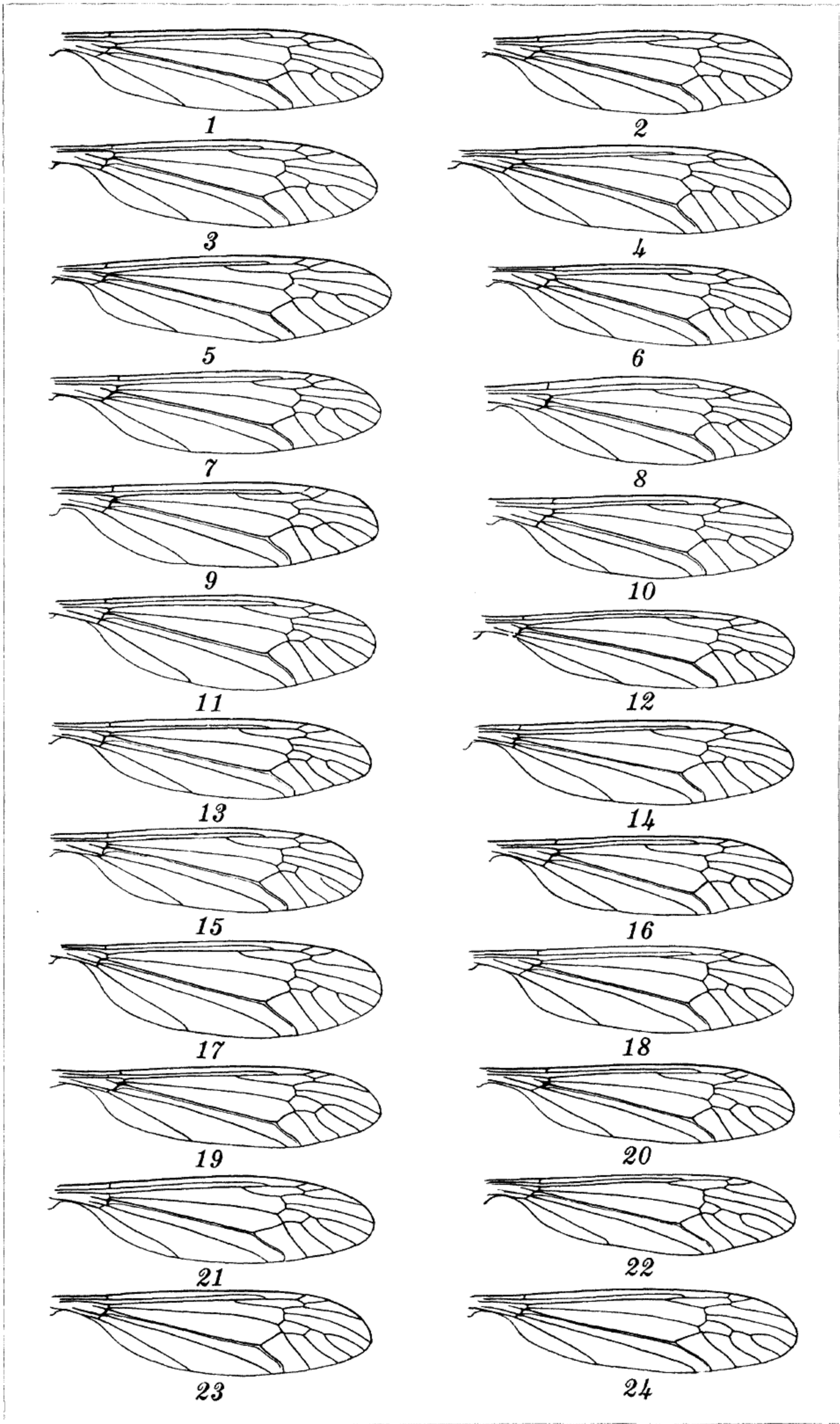


PLATE 1.

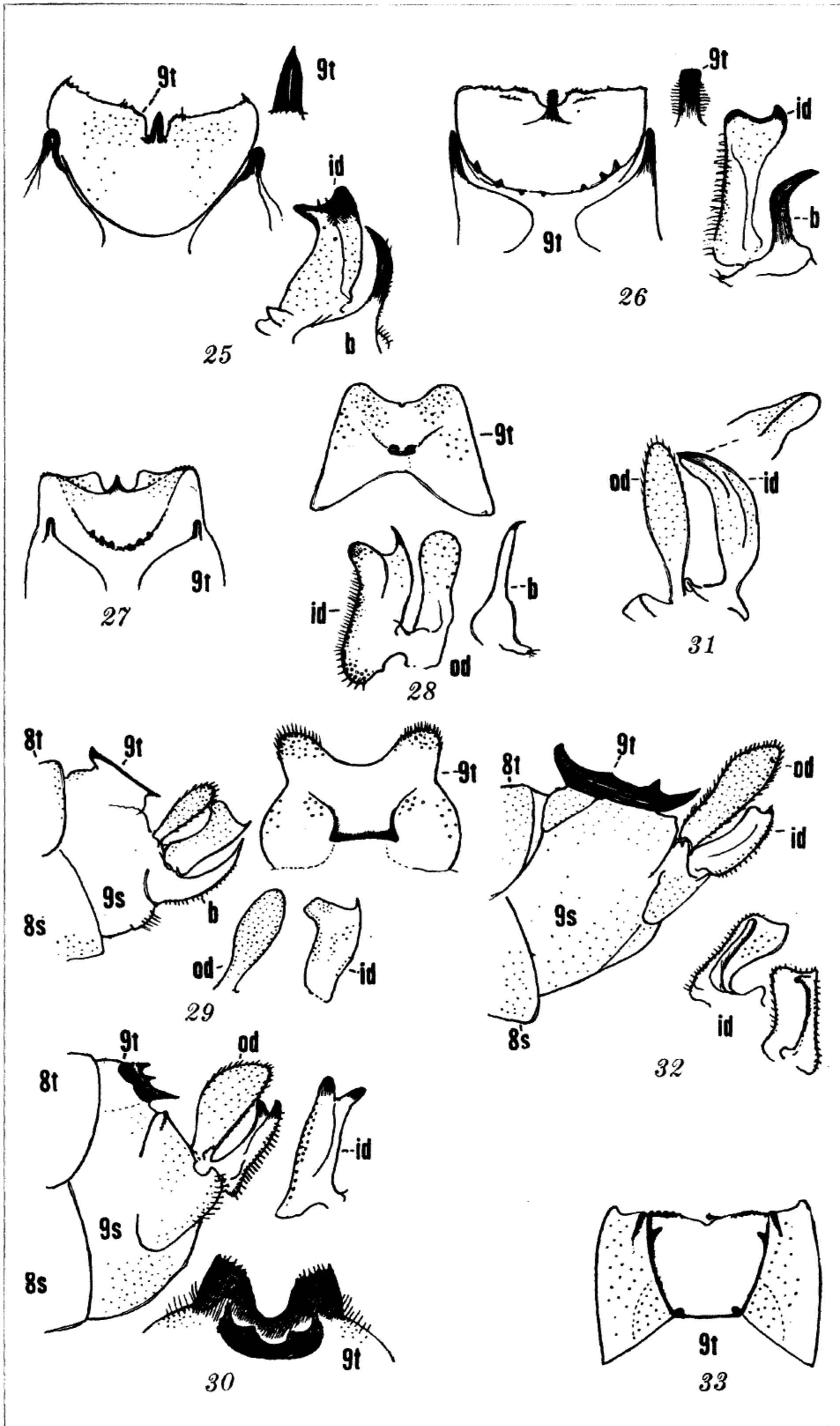


PLATE 2.

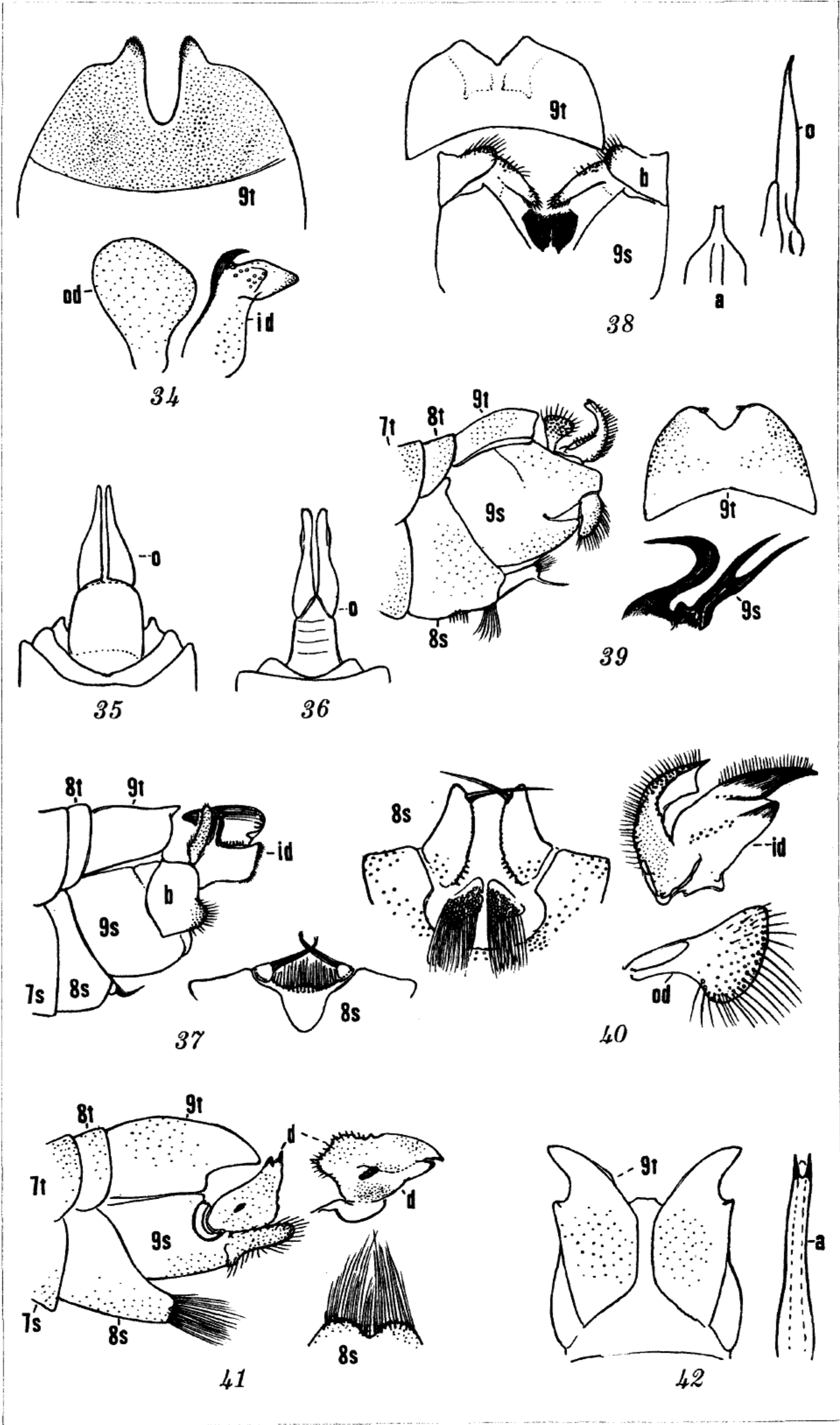


PLATE 3.

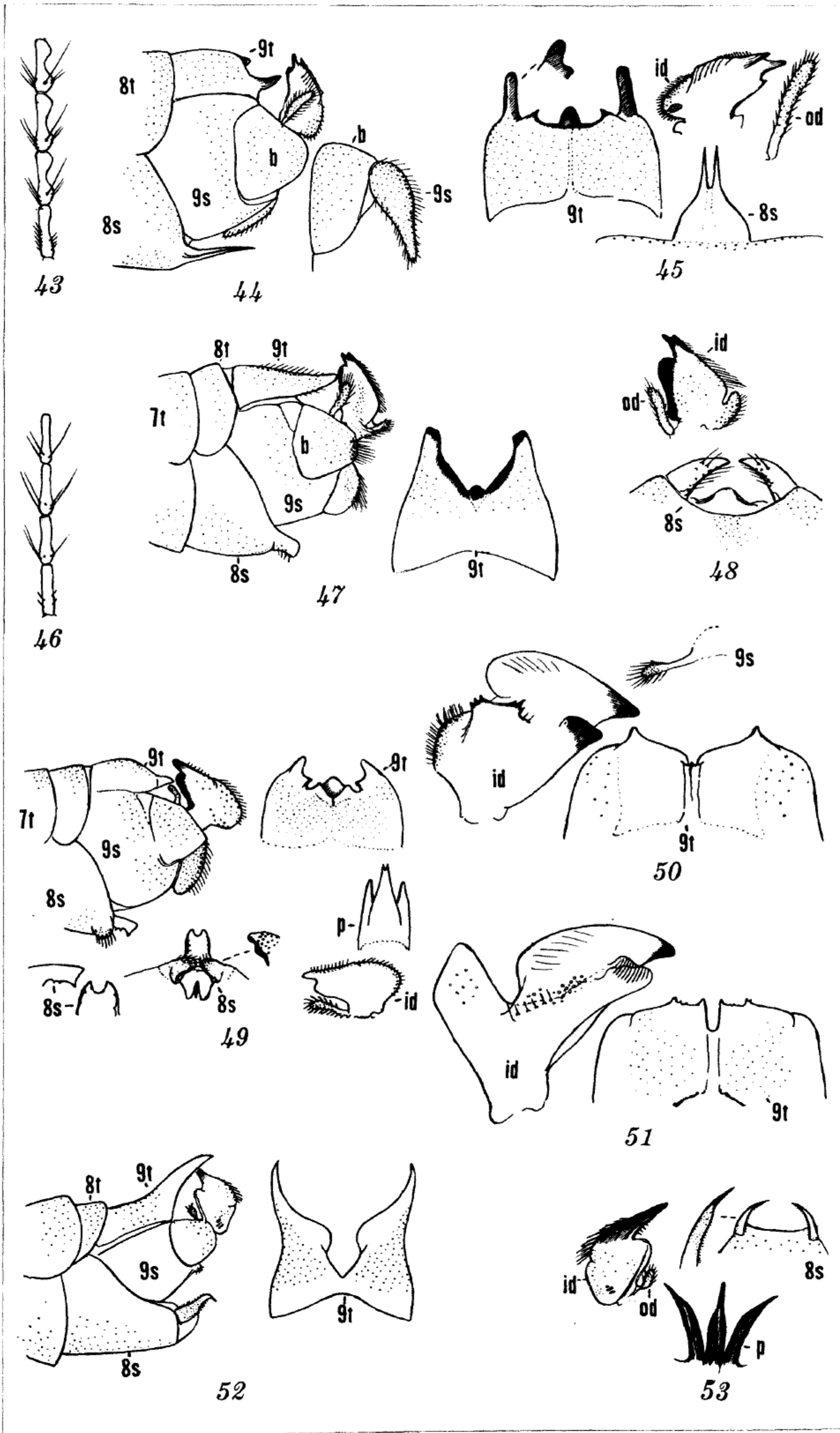


PLATE 4.



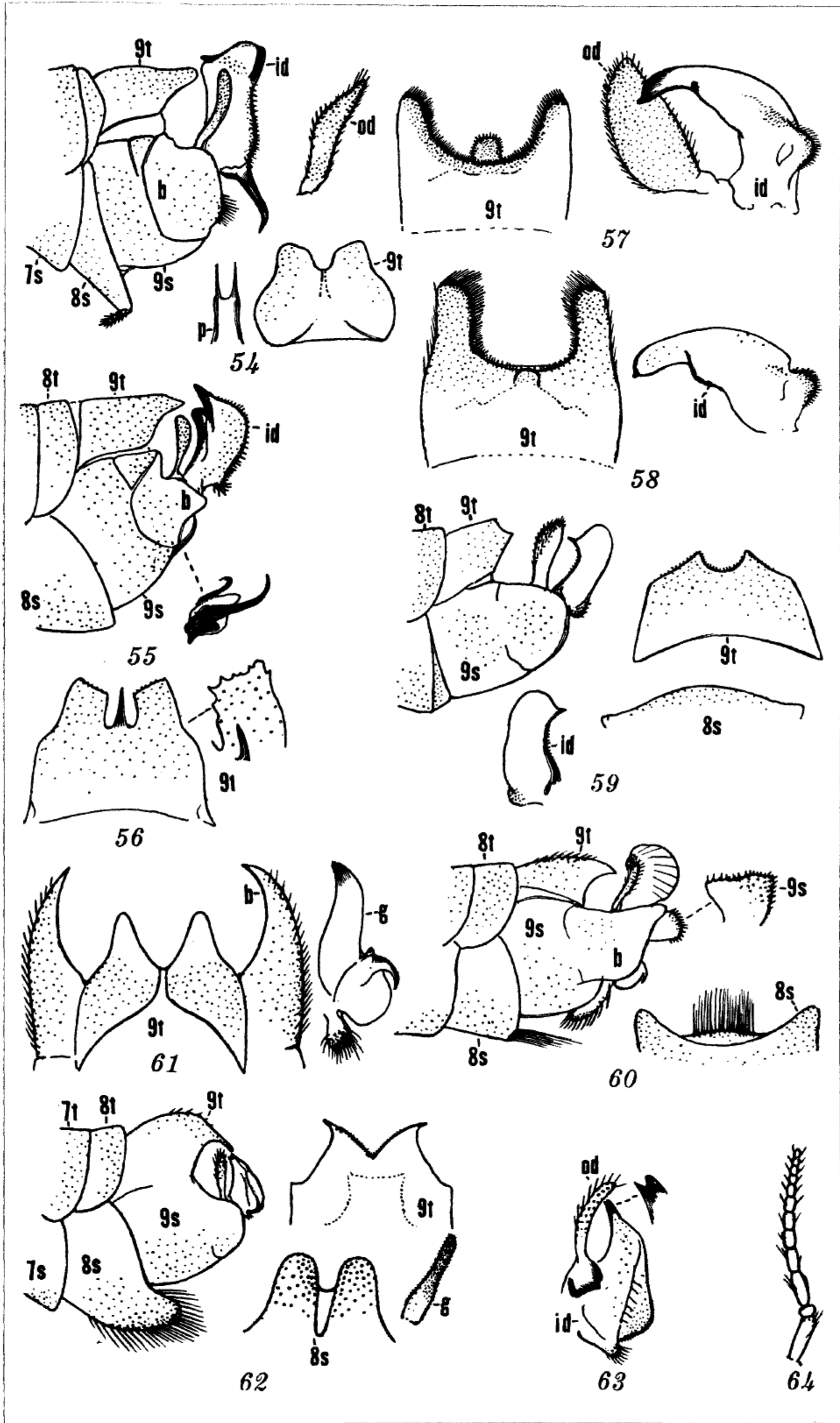


PLATE 5.