

NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN ASIA (DIPTERA), XXVIII¹

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FOUR PLATES

The new species discussed in the present report are chiefly from Kashmir, where they were collected by Miss Vivien R. Hutchinson. A few additional species are from Celebes, collected by Clagg; Java, by Handschin and Walsh; Japan, by Issiki; and China, by Franck, Graham, and Suenson. Except where stated to the contrary in the text, the types of the novelties are preserved in my collection of these flies. I wish to express my deepest appreciation to all of the above-mentioned entomologists, who have aided materially in the progress of this study of the Asiatic Tipulidæ. In order to complete the data, I have included in this paper the descriptions of a few species of the allied family Trichoceridæ, commonly called the winter crane flies.

TRICHO CERIDÆ

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

Size very large (wing, female, over 10 millimeters); general coloration uniformly dark gray to blackish gray; antennæ with basal six or seven flagellar segments incrassated, the outer segments suddenly narrowed; knobs of halteres darkened; legs brownish black; wings clear, highly iridescent; stigma conspicuous, elongate, brown, extending the entire length of vein R_{1+2} ; R_{2+3+4} shorter than R_{2+3} ; R_{1+2} elongate; abdomen uniformly dark brown; cerci with the lower or ventral edge gently emarginate.

Female.—Length, about 9 millimeters; wing, 10.4 by 3.3.

Rostrum gray; palpi black. Antennæ black throughout; basal segment of flagellum long-conical; succeeding five or six segments slightly incrassated, the remainder very slender and somewhat paler than the basal ones. Head dark gray.

¹ Contribution from the entomological laboratory, Massachusetts State College.

Mesonotum uniformly dark gray to blackish gray, without markings. Pleura dark gray. Halteres pale, the knobs infuscated. Legs with the coxæ and trochanters blackish gray; remainder of legs brownish black. Wings (Plate 1, fig. 1) clear, highly iridescent, with a conspicuous, elongate, brown stigmal area extending the entire length of vein R_{1+2} ; indications of a much smaller seam on r-m; veins dark brown, the basal third of vein M paler. Macrotrichia of veins short and inconspicuous but well distributed on almost all veins. Venation: R_{2+3+4} shorter than R_{2+3} ; R_{1+2} elongate, approximately one-half the length of Rs; cell M_1 nearly twice its petiole; m-cu at fork of M_{3+4} .

Abdomen uniformly dark brown, only the pleural membrane pale. Cerci (Plate 2, fig. 25, c) with the lower or ventral edge gently emarginate, not straight as in *simonyi*.

Habitat.—Kashmir.

Holotype, female, Bitzal Nullah, West Karakoram, altitude 14,000 feet, September 2, 1934 (*Hutchinson*).

The only other generally similar species is *Trichocera simonyi* Mik,² described from the Tyrolian Alps, at high altitudes (9,350 feet), collected in early October. Apparently this latter species is still known only from the unique female types. The present fly is almost exactly like *simonyi* in size and further agrees in the general features of coloration, but differs evidently in the conspicuous brown stigma of the wings and the distinct structure of the cerci of the ovipositor.

TRICHOCERA GLACIALIS sp. nov. Plate 1, fig. 2; Plate 2, fig. 26.

General coloration dull black, sparsely pruinose; wings subhyaline, with a sparse pale gray pattern, including seams at r-m and beneath the origin of Rs, additional to restricted markings elsewhere; R_{2+3+4} about one-half R_{2+3} ; cell M_1 a little longer than its petiole; abdomen distinctly annulated, the tergites pale brown with the caudal borders narrowly dark brown; sternites yellow, the margins narrowly pale; ventromesal lobe of basistyle at apex produced caudad into a slender dusky lobule.

Male.—Length, about 6.5 millimeters; wing, 7.5.

Rostrum brownish gray; palpi black. Antennæ with the scape and pedicel brownish black, the flagellum somewhat darker; flagellar segments beyond the first moderately incrassated, the

²Wien. Ent. Zeitung 5 (1886) 5-59.

succeeding segments gradually more slender. Head blackish gray.

Pronotum brownish black, the posterior notum obscure yellow. Mesonotum dull black, sparsely pruinose, without evident markings. Pleura dark brown, the dorsopleural region somewhat paler. Halteres relatively long, pale, the knobs infuscated. Legs with the coxæ pale, more darkened basally; tibiæ and tarsi dark brown. Wings (Plate 1, fig. 2) subhyaline, with a sparse pale gray pattern, including a seam at r-m; on one wing of type with a second area, scarcely separated from the first, lying in outer end of cell R; a large cloud beneath origin of Rs; narrow seams along m-cu and outer end of cell 1st M_2 ; very small and insignificant clouds at fork of M_{1+2} and at near two-thirds the length of cell R_4 ; vague indications of a cloud at tip of vein 2d A; stigmal area not darkened; veins brown. Macrotrichia of veins short but abundant. Venation: R_{2+3+4} unusually short, somewhat less than one-half R_{2+3} , the latter a little shorter than subequal to R_{1+2} ; basal section of R_5 slightly reduced; cell M_1 a little longer than its petiole; m-cu shortly before fork of M_{3+4} ; cell 2d A narrow.

Abdomen distinctly annulated, the tergites pale brown with their caudal margins narrowly dark brown; sternites light yellow, beyond the first segment with the caudal borders narrowly and weakly darkened; subterminal segments more uniformly darkened; hypopygium a little brightened. Male hypopygium (Plate 2, fig. 26) with the ventromesal lobe of basistyle, *b*, unusually stout, the apex truncated and with the outer apical angle further produced caudad into a slender dusky lobule; the lobes of the two sides touch and thus form a contiguous bridge. Dististyle, *d*, distinctly narrowed on a little more than the distal third, gently curved, without a distinctly developed lobule on mesal face. Gonapophyses very long and slender, gradually narrowed to needlelike points.

Habitat.—Kashmir.

Holotype, male, Kerolungma Glacier, Baltistan, altitude 11,000 feet, August 26, 1934 (*Hutchinson*).

By keys to the Holarctic species of *Trichocera*, the present fly runs to *T. annulata* Meigen, from which it differs in the patterned wings and structure of the male hypopygium. On the basis of wing pattern, the fly runs to *T. maculipennis* Meigen, differing conspicuously in the coloration of the body and wings, and in

the structure of the hypopygium, notably the peculiar apical lobule of the basistyles (coxites).

TRICHOCERA ABIETICOLA sp. nov. Plate 1, fig. 3; Plate 2, fig. 27.

General coloration dark brownish gray; legs dark brown, the femoral bases restrictedly obscure yellow; wings with a pale brown tinge, sparsely patterned with pale gray clouds, including areas on anterior cord and beneath origin of Rs; veins R_{2+3+4} and R_{2+3} both relatively long and subequal in length; abdominal tergites dark brown; ventromesal lobe of basistyle contiguous at midline with its mate of the opposite side, its apex obtusely rounded; dististyle subcylindrical, unarmed.

Male.—Length, about 6.5 millimeters; wing, 7.2 to 7.3.

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

Mesonotum almost uniformly dark brownish gray, without markings. Pleura dark gray, the dorsopleural region brown. Halteres dusky, the extreme base of stem pale. Legs with the coxæ brownish gray; trochanters pale brown; remainder of legs dark brown, the femoral bases restrictedly obscure yellow. Wings (Plate 1, fig. 3) with a very pale brownish tinge, sparsely patterned with pale gray clouds, including areas on anterior cord, beneath origin of Rs, outer end of cell 1st M_2 , fork of M_{1+2} and at near two-thirds the length of vein M_4 ; stigmal region vaguely washed with pale brown; veins dark brown. Macrotrichia of veins relatively short. Venation: R_{2+3+4} and R_{2+3} subequal and relatively long, each being nearly one-third as long as Rs; R_{2+3} longitudinal in position, not subperpendicular as in some allied species; m-cu shortly before fork of M_{3+4} .

Abdominal tergites dark brown throughout, the basal sternites somewhat paler. Male hypopygium (Plate 2, fig. 27) with the ventromesal lobe of basistyle, *b*, relatively slender, contiguous at midline with its mate of the opposite side to form a bridge, at apex gently rounded. Dististyle, *d*, slender, subcylindrical, or very slightly narrowed outwardly, unarmed at base.

Habitat.—Kashmir.

Holotype, male, Bandapur, altitude 9,000 feet, caught beneath young silver-fir trees, November, 1934 (*Hutchinson*). Paratopotypes, 1 male with type; 1 male, altitude 7,000 feet, November 15, 1934.

The nearest ally of the present species would appear to be *Trichocera glacialis* sp. nov., rather than other somewhat similar forms that are allied to *maculipennis*. Both of these Kashmir

species have the same pale gray wing pattern and uniformly darkened legs, but the present fly is readily told by the venation of the radial field, the unarmed ventromesal lobe of the basistyle, and the uniformly darkened abdomen. *Trichocera punctipennis* Brunetti and some allied forms are very different in their leg pattern, having a narrow but distinct subterminal brown ring on femora, additional to other differences of venation, wing pattern, and structure of the male hypopygium.

TIPULIDÆ

TIPULINÆ

CTENACROSCELIS NIMBUS sp. nov. Plate 1, fig. 4; Plate 2, fig. 28.

Belongs to the *brobdignagius* group; mesonotal præscutum dark brown, with four more grayish brown stripes; posterior border of scutum and scutellum entirely black; mediotergite uniformly gray; pleura yellow, with a dorsal brown stripe; wings strongly tinged with brown, variegated by clearer areas in cells M, Cu, 1st A, and 2d A; abdomen dark brownish gray; hypopygium dark; male hypopygium with the outer dististyle broad, only slightly narrowed outwardly; eighth sternite with a large brush of yellow setæ on each lateral lobe.

Male.—Length, excluding head, about 25 millimeters; wing, 36.5.

Head broken.

Pronotum chiefly light yellow, restrictedly darkened on ventral portion and on propleura. Mesonotal præscutum with the ground color dark brown, with four more grayish brown stripes, the midline broad, more than one-half as wide as either of the intermediate stripes; ground color and stripes becoming less evident and differentiated behind; lateral borders of præscutum broadly light yellow; scutum brownish gray, including the median area, the posterior border and scutellum entirely black; parascutella on posterior half more yellow; mediotergite uniformly gray. Pleura yellow, with a relatively narrow dorsal brown stripe; ventral sternopleurite very weakly darkened. Halteres dusky. Legs with the coxæ and trochanters yellow; femora yellow, the tips rather narrowly but very conspicuously blackened; tibiæ yellow, the tips narrowly and inconspicuously infuscated; tarsi passing through yellow to black. Wings (Plate 1, fig. 4) strongly tinged with brown, variegated by clearer areas across bases of anal cells and near central por-

tion of cell Cu; a conspicuous pale area in outer end of cell M; prearcular region more blackened; stigma and costal region more saturated yellow; restricted oblitative areas along cord; a narrow dark brown seam along m-cu; veins yellowish brown. Venation: R_1 shortly before fork of R_{2+3} , obliterating R_2 ; vein R_3 somewhat angularly bent at near two-thirds the length; m-cu shortly before fork of M_{3+4} .

Abdomen dark brownish gray; hypopygium dark. Male hypopygium with the ninth tergite (Plate 2, fig. 28, 9t) elongate, the caudal margin with a deep U-shaped notch, the lateral lobes subtruncate; abundant setæ on outer two-fifths of tergite, these longer and more numerous on lateral border cephalad of the lobes, the latter with relatively short setæ only. Outer dististyle, *od*, unusually broad, nearly parallel-sided, so the apex is very broad and rounded; distal third of style without setæ; basal setæ more elongate. Inner dististyle, *id*, enlarged at outer end. Eighth sternite, 8s, relatively long, the caudal margin deeply notched but with the emargination chiefly filled with pale membrane; lateral lobes obliquely truncated, tufted with dense brushes of long yellow setæ; ventral surface of lobes with abundant smaller setæ, narrowly lacking on the midline behind base of the emargination.

Habitat.—China (Szechwan-Tibet border).

Holotype, male, Mupin, altitude 3,500 feet, June, 1929 (*Graham*); type in the United States National Museum collection.

The present species is most nearly allied to *Ctenacroscelis libertus* Alexander, differing in the coloration of the mesonotum and wings, and in the structure of the male hypopygium, especially of the styli and the eighth sternite.

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

Allied to *griseipennis*; frontal prolongation of head elongate, nasus lacking; antennal flagellum almost uniformly brownish black; head gray, with a median brown area; mesonotal præscutum gray, with three darker gray stripes that are narrowly bordered by dark brown; legs yellow, the tips of femora, tibiæ, and basitarsi narrowly darkened; wings whitish subhyaline, with a pale gray and grayish brown tessellated pattern; abdomen (male) chiefly yellow, the basal tergite gray, the terminal two segments black; in female, abdominal tergites broadly darkened laterally; male hypopygium with the median tergal lobe very low and obtuse, set with microscopic black spines and

spinous setæ; a single complex bilobed dististyle; eighth sternite unarmed.

Male.—Length, about 18 millimeters; wing, 20.5.

Female.—Length, about 23 to 24 millimeters; wing, 27.

Frontal prolongation of head long and slender, entirely without nasus, brownish black; palpi black, relatively short. Antennæ with scape and pedicel yellow; flagellum almost uniformly brownish black, the basal enlargements of the segments only a trifle darker than the remainder; flagellar segments very feebly incised; verticils shorter than the segments. Head gray, the central portion of the postfrons and vertex occupied by a conspicuous dark brown area; vertical tubercle low and indistinct.

Mesonotal præscutum light gray, with three darker gray stripes, the broad median stripe narrowly bordered on outer margins by dark brown and further split by a very indistinct, paler gray, median vitta; lateral stripes with a dark brown spot at cephalic-lateral portion; female with lateral stripes entirely bordered by dark brown; scutal lobes gray, each variegated by two brown areas, the more anterior smaller and darker; scutellum and mediotergite gray, the latter with indications of a darker median vitta. Pleura dark gray, the dorsopleural membrane infuscated; a few short setæ on propleura. Halteres obscure yellow, the bases of knobs infuscated. Legs with the coxæ gray; trochanters pale, their apices darkened; femora yellow, the tips narrowly but conspicuously blackened; tibiæ and basitarsi obscure yellow, clearer basally, the tips narrowly brownish black; remainder of tarsi brownish black. Wings (Plate 1, fig. 5) whitish subhyaline, with a pale gray and grayish brown tessellated pattern, distributed about as in other members of the subgenus; stigma and a confluent area on anterior cord, together with a small spot at origin of Rs, darker; cells C and Sc uniformly pale; small spots of the ground color in outer ends of cells R_2 to 2d A, inclusive, becoming larger in the posterior cells; veins brownish yellow to pale brown. Venation: R_{1+2} entire; Rs from one-third to one-half longer than m-cu.

Abdomen (male) obscure yellow, the basal segment gray, the succeeding segments more grayish laterally; sternites narrowly darkened on sides; outer two segments uniformly brownish black. In female, abdomen with basal tergite gray, succeeding segments chiefly dark brown, bordered laterally and caudally by grayish, the median region of tergites broadly yellow. Male

hypopygium (Plate 2, fig. 29) with the suture between the tergite, 9t, and sternite, 9s, feebly indicated; ninth sternite deeply emarginate, the edges of the incision with abundant short erect brown setæ. Ninth tergite (Plate 2, fig. 30, 9t) short and compact, the median area decurved into a low obtuse lobe set with short dense black spines and spinous setæ. A single complex dististyle, about as illustrated (Plate 2, fig. 30, d). Eighth sternite unarmed.

Habitat.—Kashmir.

Holotype, male, Baltistan, altitude 14,000 feet, July 18, 1934, resting under rocks on stony hillside (*Hutchinson*).

Allotopotype, female. Paratype, female, Deosai, Shingo Valley, altitude 11,800 feet, July 24, 1934 (*Hutchinson*).

I take great pleasure in naming this striking fly in honor of the collector, Miss Vivien R. Hutchinson, who has added materially to our hitherto scanty knowledge of the Tipulidæ of Kashmir. The fly is most nearly related to *Tipula* (*Sinotipula*) *griseipennis* Brunetti, which differs evidently in the bicolorous antennæ and in the structure of the male hypopygium, as the apex of the tergal lobe.³

TIPULA (ACUTIPULA) IRREQUIETA sp. nov. Plate 1, fig. 6; Plate 2, fig. 31.

General coloration gray, præscutal stripes not or scarcely indicated; antennæ yellow; wings with cells of outer radial field whitish, the remaining cells pale yellowish brown to gray; abdominal tergites brownish gray, the sublateral borders darker brown; male hypopygium with the tergite and sternite separated by a weak suture; median lobe of tergite very low and depressed, with a small notch, producing two broad obtuse lobules set with blackened spines.

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

Frontal prolongation of head light brown; nasus distinct; palpi chiefly pale. Antennæ yellow, the bases of the flagellar segments not or scarcely darkened; verticils considerably longer than the segments. Head brown, the front and anterior vertex more silvery gray.

Pronotum yellowish gray. Mesonotum gray, the præscutal stripes not or scarcely indicated; humeral region restrictedly pale yellow; lateral portions of mediotergite narrowly pale. Pleura yellowish gray, the dorsal pleurotergite somewhat darker. Halteres dusky, the base of stem scarcely paler. Legs with the

³ Edwards, Rec. Indian Mus. 26 (1924) 305; Ann. & Mag. Nat. Hist. X 1 (1928) 687.

coxæ and trochanters yellow; femora and tibiæ yellowish brown, the tips narrowly and weakly darkened; tarsi pale brown, passing into darker. Wings (Plate 1, fig. 6) narrow, conspicuously bicolorous; ground color of cells before cord and outer medial field pale yellowish brown to gray, the outer radial field and cell 1st M_2 abruptly whitish, this latter color likewise involving restricted portions of cells R_1 , R , and M , and narrow bases of M_1 , 2d M_2 , and M_3 , cells C and Sc infumed but much paler than the brown stigma; a conspicuous dark cloud in outer end of cell M ; veins brown. Macrotrichia of veins beyond cord virtually lacking. Venation: R_{1+2} elongate, nearly straight, subequal to R_s or R_{4+5} ; petiole of cell M_1 shorter than $r-m$.

Abdominal tergites brownish gray, the sublateral borders rather broadly darker brown, the extreme lateral margins gray; sternites a little paler, bordered with dusky. Male hypopygium with the tergite and sternite separated by a weak suture; basistyle separated by a ventral suture only. Ninth tergite (Plate 2, fig. 31, 9t) with the median lobe very low and depressed, with a small notch that produces two broad obtuse lobules that are set with blackened spines. Outer dististyle, *od*, very broad, pale. Inner dististyle, *id*, complex, as figured.

Habitat.—Kashmir.

Holotype, male, Skarda, Baltistan, altitude 7,000 feet, September 10, 1934, at light in tent (*Hutchinson*).

Tipula (*Acutipula*) *irrequieta* is very different from all other described species of the subgenus, differing especially in the peculiar nature of the wing pattern and in the structure of the male hypopygium. The suture between the tergite and the sternite of the latter is more distinct than in most other species of the subgenus. The present fly shows several points of resemblance to the typical subgenus *Tipula*, especially to members of the *oleracea* group, but from the structure of the hypopygium and the nature of the trichiation of the wing veins I prefer to place it in *Acutipula*, at least until more material becomes available.

TIPULA (OREOMYZA) BALTISTANICA sp. nov. Plate 1, fig. 7; Plate 2, figs. 32, 33.

Belongs to the *variipennis* group; nasus distinct; general coloration gray, the præscutum with four entire brown stripes; femora yellow, the tips narrowly but conspicuously blackened; claws (male) simple; wings cream-colored, variegated by abundant zigzag pale gray clouds; basal section of R_{4+5} reduced, abdominal tergites orange-yellow, with a broad, brownish black,

lateral stripe; eighth and ninth sternites blackened; male hypopygium with the eighth sternite transverse or weakly convex across margin, set with abundant spinous setæ.

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

Frontal prolongation of head gray, relatively long; nasus distinct, tufted with long yellow setæ; palpi black. Antennæ (male) moderately long, if bent backward extending about to root of halteres; scape and pedicel brownish yellow, flagellum black; flagellar segments moderately incised, with verticils that are shorter than the segments. Head gray, the orbits a trifle clearer gray.

Mesonotal præscutum light gray, with four entire brown stripes, the anterior ends of the intermediate pair obsolescent; pseudosutural foveæ black, subcircular; scutal lobes gray, each with two separate brown areas; scutellum and mediotergite gray, the parascutella more yellow. Pleura gray; dorsopleural membrane yellow. Halteres obscure yellow, the knobs infuscated. Legs with the coxæ gray; trochanters brownish yellow; femora yellow, the tips narrowly but conspicuously blackened, the amount subequal on all legs; tibiæ brownish yellow, becoming more obscure outwardly, the tips blackened; tarsi brownish black; claws (male) simple. Wings (Plate 1, fig. 7) with the ground cream-colored, variegated by tessellated pale gray clouds; cell Sc and the stigma uniformly brown; the zigzag cream and gray areas include all cells; the posterior prearcular region and bases of anal cells pale; veins dark. Venation: Basal section of R_{4+5} reduced; veins inclosing cells M_1 and 1st M_2 arcuated, as in the group.

Abdominal tergites orange-yellow, with a broad, brownish black, lateral stripe that is narrowly interrupted at the posterior portion of the segments; sternites similar, the eighth and ninth sternites blackened. Male hypopygium (Plate 2, fig. 32) small; tergite, 9*t*, and sternite separate; ventral suture short. Ninth tergite (Plate 2, fig. 32, 9*t*) with a broad rounded emargination on posterior border, the lateral lobes decurved into blackened points that are more or less bifid at tips. Basistyle, *b*, at proximal ends of dististyles with an obtuse blackened lobe on mesal aspect. Both dististyles (Plate 2, fig. 33, *id*, *od*) small and simple, dark-colored; outer style flattened, the margin at base narrowly blackened and microscopically roughened. Eighth sternite, 8*s*, with apex transverse or weakly convex, set with abundant spinous setæ.

Habitat.—Kashmir.

Holotype, male, Baltistan, altitude 11,800 feet, July 2, 1934 (*Hutchinson*). Paratopotypes, 6 males, July 2 to 4, 1934; paratype, 1 male, Deosai, Shingo Valley, July 23, 1934 (*Hutchinson*).

The venation and the type of hypopygium of the present fly are much as in members of the *marmorata* group, but the claws of the male are simple and I am referring the species to the *variipennis* group. The fly bears a superficial resemblance to *Tipula* (*Oreomyza*) *tetragramma* Edwards (Yunnan), but is amply distinct.

TIPULA (OREOMYZA) VENERABILIS sp. nov. Plate 1, fig. 8; Plate 3, fig. 34.

General coloration brownish gray, the præscutum with four narrow brown stripes; antennæ (male) relatively long, if bent backward extending about to base of abdomen; legs black, the femoral bases brightened; claws simple; wings narrow, obscure yellow, the prearcular field orange-yellow; a sparse clouded brown pattern, including an area in center of outer radial field; m-cu close to fork of M; abdomen brownish yellow, the lateral portions of the tergites darkened; male hypopygium with the ninth tergite notched, the margins set with blackened spines; eighth sternite with caudal margin convexly rounded, without lobes.

Male.—Length, 10 to 13 millimeters; wing, 11 to 14.

Frontal prolongation of head brownish black, gray pruinose; nasus long and slender; palpi black. Antennæ with scape and pedicel yellow; flagellum black; antennæ moderately elongate, in male, if bent backward extending about to base of abdomen; flagellar segments feebly incised; verticils shorter than the segments; terminal segment globular. Head brownish gray, somewhat darker behind.

Mesonotal præscutum brownish gray, clearer gray on lateral and humeral portions; four narrow dark brown stripes, the anterior ends of the intermediate pair invaded by gray; pseudosutural foveæ reduced to tiny black spots; scutum gray, each lobe with two brown areas; posterior sclerites of notum gray. Mesonotum small and relatively low. Pleura gray; dorsopleural region brownish yellow. Halteres brown, the knobs darker. Legs with the coxæ gray; trochanters brownish yellow; femora black, the bases restrictedly obscure yellow; tibiæ and tarsi black; claws simple. Wings (Plate 1, fig. 8) narrow; ground color obscure yellow, the prearcular field orange-yellow; stigma brown;

a conspicuous brown cloud in outer radial field, involving cells R_2 and R_3 but not reaching apices of cells, more extensive in some specimens than in others but apparent in all individuals; cell C pale brownish yellow, Sc clearer yellow; a pale brown cloud on anterior cord; weak gray washes in outer ends of cells Cu, 1st A, and 2d A; veins brown, the prearcular veins and basal third of M yellow. Venation: Sc_1 indicated by a spur; R_{1+2} preserved; Rs elongate, with strong trichia; cell 1st M_2 narrow, parallel-sided; petiole of cell M_1 subequal to or exceeding m; M_{3+4} very short to virtually lacking; m-cu on M_4 just beyond origin and thus close to fork of M.

Abdomen brownish yellow, the lateral portions of the tergites narrowly gray, the sublateral portions of both tergites and sternites weakly infuscated, becoming somewhat more extensive on outer segments; basal tergite gray; subterminal sternites brownish gray; hypopygium pale. The paratype from Deosai has the abdomen uniformly dark gray, the caudal and lateral borders of the segments narrowly yellow. Male hypopygium (Plate 3, fig. 34) small and simple; suture between tergite, 9t, and sternite indicated; suture between basistyle, b, and sternite long and straight. Ninth tergite, 9t, extensive, broader than long, the caudal margin with a very broad V-shaped emargination, at base of which is a small U-shaped notch; apical margin of lobes set with small blackened spines; a group of from fifteen to twenty black setæ surrounding the median notch; on ventral surface near lateral border with a small curved appendage on either side. Basistyle, b, with a blackened obtuse lobe on mesal aspect at base of dististyles. Both dististyles, id, od, simple, the outer with posterior margin on basal half narrowly blackened. Eighth sternite, 8s, with apex convexly rounded, with a few strong, erect, black setæ at this point.

Habitat.—Kashmir.

Holotype, male, Upper Pulwar Nullah, altitude 11,000 feet, October 2, 1934 (*Hutchinson*). Paratopotypes, 20 males; paratype, male, Deosai, altitude 13,000 feet, September 13, 1934 (*Hutchinson*).

I refer the species to *Oreomyza* with some slight doubt. The general appearance is more as in some members of the typical subgenus, as the *luteipennis* group, but the present insect seems to be more nearly related to *variipennis* and allies. The peculiar wing pattern is distinctive.

TIPULA (OREOMYZA) ICARUS sp. nov. Plate 1, fig. 9; Plate 3, figs. 35, 36.

Sexes strongly dimorphic, the males fully winged, the females subapterous; mesonotal præscutum light gray with two intermediate more brownish stripes that are a little bowed at midlength; fore femora chiefly blackened, the remaining femora reddish brown with the tips narrowly blackened; wings (male) almost uniformly grayish yellow, the stigma pale yellowish brown; abdominal tergites dark gray, narrowly margined caudally and laterally with yellow; male hypopygium with lateral lobes of tergite of unusual length.

Male.—Length, 10 to 12 millimeters; wing, 12 to 15.

Female.—Length, about 13 to 14 millimeters; wing, 2.8 to 3.

Male.—Frontal prolongation of head of moderate length, dark gray; nasus short and stubby, with long yellow setæ. Antennæ of moderate length; scape and pedicel brownish black, flagellum black throughout; flagellar segments not or scarcely incised; verticils subequal to or shorter than the segments. Head gray; anterior vertex broad.

Mesonotal præscutum light gray, with two, intermediate, more brownish stripes that are a little bowed at midlength, inclosing a slightly darker gray median vitta; lateral stripes obsolete; scutal lobes weakly darkened; posterior sclerites of notum gray. Pleura gray; dorsopleural membrane buffy. Halteres brown, the base of stem yellow, the knob dark brown. Legs with the coxæ gray; trochanters obscure yellow; fore femora chiefly blackened, the bases narrowly pale; middle and posterior femora more reddish brown, the tips narrowly blackened; tibiæ brown, the tips narrowly darkened; tarsi black; tibial spur formula 1-2-2; claws simple. Wings (Plate 1, fig. 9) broad, almost uniformly grayish yellow; stigma pale yellowish brown; veins brown. Macrotrichia abundant on veins beyond cord but lacking on Rs; squama naked. Venation: R_{1+2} elongate, with trichia on basal two-thirds; petiole of cell M_1 exceeding m ; M_{3+4} subequal to basal section of M_{1+2} ; $m-cu$ just beyond origin of M_4 .

Basal tergite chiefly buffy; succeeding tergites dark gray, narrowly margined laterally and caudally with yellow; hypopygium pale reddish; sternites almost uniformly gray. Male hypopygium (Plate 3, fig. 35) with the tergite, $9t$, separated from the sternite, $9s$; basistyle, b , and sternite chiefly fused, but with the suture indicated though delicate. Ninth tergite (Plate 3, fig. 36, $9t$) with lateral lobes of unusual length, the median

region of the notch produced into a low obtuse mound; lobes with the setæ sparse, erect or even retrorse at near midlength. Basistyle with outer end gradually narrowed to a subacute spinous point, on ventral surface with several elongate setæ. Outer dististyle (Plate 3, fig. 35, *od*) relatively slender, the distal two-thirds dilated into a weak blade, with abundant conspicuous setæ. Inner dististyle, *id*, with the outer margin at base prolonged into a flattened lobe. Membrane between eighth, 8s, and ninth sternites, 9s, with a median group of long yellow setæ, directed chiefly ventrad.

Female.—Generally as in male but subapterous. Mesonotal præscutum more buffy gray. Wings short and obtuse; venation distinct but distorted; costal margin with unusually abundant black trichia, darkening the border. Ovipositor with the cerci and hypovalvæ elongate, the tips of the latter more obtuse.

Habitat.—Kashmir.

Holotype, male, Baltistan, altitude 11,800 feet, August 2, 1934 (*Hutchinson*). Allotopotype, female, with the type. Paratopotypes, 5 males, 1 female, July 10 to August 2, 1934.

The present species is very different from other clear-winged species of the genus having nearly apterous females. The chief specific characters are to be found in the male hypopygium, notably of the tergite. The specific name, *icarus*, is in allusion to the flightless condition of the female.

TIPULA (LUNATIPULA) SUBMARMORATIPENNIS sp. nov. Plate 3, figs. 37, 38.

Belongs to the *marmoratipennis* group; general coloration of mesonotal præscutum light gray, with four darker gray stripes that are narrowly margined with light brown; antennæ bicolorous; pleura yellow, in cases with the dorsal sclerites darkened; femora, tibiæ, and basitarsi yellow, their tips narrowly blackened; wings yellow to brownish yellow, marmorate with brown and gray areas; abdomen fulvous, the tergites narrowly trivittate with black, without silvery areas; terminal segments in male darkened; male hypopygium with eighth sternite moderately sheathing, with lateral brushes of setæ, the median area with abundant small spinous points.

Male.—Length, 16 to 20 millimeters; wing, 21 to 26.

Female.—Length, 23 to 27 millimeters; wing, 25 to 30.

Frontal prolongation of head yellow above, darker laterally; nasus powerfully developed; palpi with basal three segments and proximal end of last dark brown, the remainder of terminal segment light yellow. Antennæ with scape and pedicel yellow;

flagellar segments bicolorous, the basal enlargements dark brown, the remainder brownish yellow, on outer segments more uniformly darkened; verticils exceeding the segments in length. Head buffy, overcast with light gray, the orbits brighter; a narrow dark brown vitta extends from the summit of the entire vertical tubercle almost to occiput.

Mesonotal præscutum light gray, with four darker gray stripes that are narrowly margined with light brown; setigerous punctures of interspaces relatively conspicuous; scutum light gray, the lobes variegated by darker gray; scutellum and mediotergite gray, with a very conspicuous, dark brown, median stripe. Pleura yellow, including the dorsopleural membrane, this latter darker in females; sternopleurite with pale setæ. Halteres buffy, the knobs dark brown with pale apices. Legs with the coxæ and trochanters pale yellow; femora yellow, the tips narrowly blackened; tibiæ and basitarsi pale yellow, the tips narrowly darkened, the outer tarsal segments black. Wings with the ground color yellow (female) to brownish yellow (male), variegated with brown and gray washes, arranged about as in the *marmoratipennis* group; conspicuous brown clouds at ends of longitudinal veins; an oblique pale yellow line at near mid-length of cell M, separating two pale brown washes; veins brown, more yellow in the female. Venation: Cell 1st M_2 strongly pointed at inner end; petiole of cell M_1 short; m-cu strongly arcuated, placed before midlength of cell 1st M_2 .

Abdominal tergites fulvous, narrowly trivittate with brownish black, the terminal segments (male) brownish black, sparsely pruinose; in female, abdomen more uniformly brightened, the dark vittæ very narrow, the terminal segments weakly darkened; no silvery patches on abdomen, as is the case in allied species. Male hypopygium (Plate 3, fig. 37) with the tergite, 9t, separated from the sternite, 9s, by an incomplete suture. Ninth tergite (Plate 3, fig. 38, 9t), viewed from above, with a pair of low sublateral tubercles that are tipped with a brush of long coarse black setæ; and a pair of submedian tubercles similarly clothed with short spinous setæ; viewed from the side, a blackened point protrudes caudad. Outer dististyle (Plate 3, fig. 38, od) boomerang-shaped, at apex with three or four black spines. Inner dististyle (Plate 3, fig. 38, id) arcuate, the distal half narrowed into a slender blackened point, the outer margin with long coarse setæ. Eighth sternite (Plate 3, fig. 37, 8s) only slightly sheathing; apex subtruncate, each outer angle with a

brush of scanty long yellow setæ; the broad median area is abundantly dotted with tiny, blackened, peglike spines. Ovipositor with short, fleshy, divergent valves, as in the group.

Habitat.—Kashmir.

Holotype, male, Upper Pulwar Nullah, altitude 11,000 feet, October 2, 1934 (*Hutchinson*). Allotype, female, Lower Pulwar Nullah, altitude 9,000 feet, October 12, 1934, came to light in tent; camp in walnut grove near spring (*Hutchinson*). Paratopotype, 1 female, with type; paratypes, 1 male, 1 female, with the allotype.

The nearest regional ally is *Tipula* (*Lunatipula*) *marmoratipennis* Brunetti (Darjiling, eastern Himalayas, altitude 7,000 feet, May and August). I have been privileged to study both the holotype and paratype specimens of this latter species and have provided supplementary details of structure and coloration in another paper. The latter fly has the antennal flagellum almost uniform obscure yellow, scarcely bicolorous; tibiæ and tarsi brownish black; basal five abdominal tergites orange-fulvous (female), trivittate with black, the segments with silvery gray lateral areas; outer abdominal segments darker brown, heavily pruinose.

TIPULA (LUNATIPULA HYPOVALVATA sp. nov. Plate 1, fig. 10; Plate 3, figs. 39, 40.

General coloration of præscutum yellowish gray, with two narrow brown intermediate stripes; pleura yellow; antennæ bicolorous; wings strongly tinged with brownish yellow, obliterative areas restricted; basal segments of abdomen yellow, in female with conspicuous brown lateral stripes; subterminal segments of abdomen darkened; male hypopygium with caudal margin of tergite trilobed; basistyle produced into an obtuse flattened lobe; a long setiferous lobe in membrane between eighth and ninth tergites; female with hypovalvæ reduced to slender dark spines.

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

Female.—Length, about 19 millimeters; wing, 15.

Frontal prolongation of head yellow, scarcely darker laterally; nasus distinct; palpi brown, the relatively short terminal segment darker brown. Antennæ (male) moderately elongate, if bent backward extending nearly to root of halteres; basal three segments yellow, the succeeding segments bicolorous, the basal enlargements dark, the terminal segments more uniformly darkened. Head brownish gray, the front and posterior orbits somewhat clearer gray.

Mesonotal præscutum yellowish gray, with two narrow brown intermediate stripes, their anterior ends subobsolete and passing into gray; scutum yellowish gray, the scutellum and mediotergite clearer yellow. Pleura yellow, including the dorsopleural membrane. Halteres infumed. Legs with the coxæ and trochanters light yellow; femora yellow, the tips very narrowly and indistinctly darkened; tibiæ brownish yellow, the tips very narrowly infuscated; tarsi passing through obscure yellow to black. Wings (Plate 1, fig. 10) with a strong and almost uniform brownish yellow tinge, cell Sc clearer yellow, cell C more brownish yellow; stigma pale brown; oblitative areas before the stigma and along cord very restricted, beyond the stigma scarcely evident; veins pale brown. Squamal setæ from five to seven in number, strong; trichia of veins beyond cord relatively short but numerous. Venation: R_{1+2} entire; cell 1st M_2 elongate, its outer end somewhat pointed by the obliquity of m, the latter longer than the petiole of cell M_1 .

Abdomen (male) yellow, the seventh to ninth tergites blackened; sternite seven blackened basally and at sides, the caudal portion pale; ninth sternite paler; a very indistinctly darker lateral stripe on tergites. What evidently represents the female of this same species has the abdomen quite different in pattern, the tergites with a very broad and conspicuous brownish black lateral stripe; tergites seven to nine more uniformly blackened; tergal shield more polished chestnut-brown; cerci relatively strong, nearly straight, the valves lying obliquely or subtransversely; hypovalvæ reduced to slender dark spines, their tips more or less convergent. Male hypopygium (Plate 3, fig. 39) with the tergite, 9t, entirely separated from the sternite, 9s, by a suture. Ninth tergite (Plate 3, fig. 40, 9t) with the caudal margin trilobed, the lateral lobes longer but slender; a smaller, more-depressed, median lobe at end of a U-shaped dorsal depression. Basistyle, b, with the ventral suture well indicated, the apical portion of the sclerite produced into an obtuse flattened lobe. Outer dististyle (Plate 3, fig. 40, od) slender, with abundant setæ on distal half. Inner dististyle, id, with a complex setiferous lobe at base of outer portion. A fleshy cushion on membrane between the eighth, 8s, and ninth, 9s, sternites, provided with long conspicuous yellow setæ.

Habitat.—Kashmir.

Holotype, male, Sind Valley, altitude 9,000 feet, June 14, 1934 (*Hutchinson*). Allotopotype, female. Paratopotype, male;

paratypes, 3 males, without exact locality, altitude 9,000 feet, August 21, 1934 (*Hutchinson*).

The present species is most closely allied to *Tipula* (*Lunatipula*) *manca* Alexander and *T. (L.) terebrina* Alexander, differing especially in the venation, coloration of the wings, and details of structure of the male hypopygium. The structure of the ovipositor is very peculiar.

TIPULA XANTHOCERA sp. nov. Plate 1, fig. 11; Plate 3, figs. 41, 42.

Allied to *ligulifera*; mesonotal præscutum brown, with four grayish brown stripes; antennæ (male) elongate, approximately one-half as long as body, the basal segments yellow, the outer segments bicolorous, the basal enlargement of each segment yellow, the apical portion darker; femora and tibiæ yellow, the tips narrowly blackened; wings broad, strongly suffused with yellow; cell M_1 short-petiolate; abdomen yellow, the tergites trivittate with black, the lateral stripes very broad and conspicuous; a subterminal black ring; male hypopygium with a tooth on mesal face of outer dististyle; a conspicuous flattened lobe at extreme base of ninth sternite.

Male.—Length, about 12 millimeters; wing, 10.5; antenna, about 6.

Frontal prolongation of head relatively short, entirely yellow; nasus distinct; palpi brownish yellow. Antennæ (male) elongate; basal half yellow, the outer segments bicolorous, with the basal enlargements of the individual segments light yellow, the long apical pedicels pale brown; flagellar segments feebly incised; verticils shorter than the segments. Head yellowish brown, with a faint gray cast.

Mesonotal præscutum brown, with four grayish brown stripes that are poorly defined against the ground; scutal lobes grayish brown, the median region and posterior portions of the lobes a trifle brightened; scutellum yellowish gray; mediotergite brownish yellow. Pleura uniformly pale yellow. Halteres yellow, the base of knob weakly darkened. Legs with the coxæ and trochanters pale yellow; femora and tibiæ yellow, the tips narrowly but conspicuously blackened; basitarsi brown, passing into black; remainder of tarsi black; claws simple. Wings (Plate 1, fig. 11) broad, uniformly suffused with yellow, the prearcular and costal fields more saturated yellow; stigma small, pale brown; veins yellow. Venation: R_s short, subequal to $m-cu$; R_2 relatively long; R_{1+2} entire, very gently diverging from R_3 ; petiole

of cell M_1 very short; cell 1st M_2 parallel-sided or slightly narrowed at distal end; M_{3+4} very short; m-cu joining M_4 some distance beyond origin of latter.

Abdomen yellow, the tergites trivittate with brownish black, the median stripe very narrow and paler; lateral stripes broad and intense; all stripes beginning at base of tergite two, lateral stripes continuous, widening behind; segments seven and eight entirely black, the hypopygium chiefly paler; sternites pale yellow, the subterminal segments weakly darkened. Male hypopygium (Plate 3, fig. 41) small, the tergite, 9t, entirely separated from the elongate sternite-basistyle, 9s, by membrane; median notch of sternite with a tumid U-shaped setiferous lobe on posterior half. Ninth tergite (Plate 3, fig. 42, 9t) extensive, flattened, the caudal margin with a broad V-shaped notch, with a small, pale, triangular point at base; mesal margins of lobes set with blackened peglike spines; ventral surface of tergite with extensive and conspicuous lobes and projections. Outer dististyle (Plate 3, fig. 42, od) narrow, on inner face at near mid-length with a very conspicuous erect black spine. Inner dististyle as shown (Plate 3, fig. 42, id); posterior margin near base with a small setiferous lobe. At extreme cephalic end of ninth sternite a conspicuous flattened pale ligula (Plate 3, fig. 41, 9s), slightly obovate in outline, the apex truncated to very weakly emarginate medially; surface with abundant delicate setæ.

Habitat.—Kashmir.

Holotype, male, Gurais, altitude 7,000 feet, September 15, 1934 (*Hutchinson*).

The nearest ally of the present fly is *Tipula ligulifera* Alexander (eastern Siberia), which differs in the narrower wings, short antennæ, and details of coloration and structure of the male hypopygium. I am still unable to place these species in a subgeneric group, but am inclined to believe that they may best be placed in *Yamatotipula*. The resemblance to species of the *luteipennis* group of the typical subgenus is superficial only.

NEPHROTOMA INCONSEQUENS sp. nov. Plate 1, fig. 12; Plate 4, fig. 43.

Size small; flagellar segments (male) strongly binodose; pronotum orange; præscutum orange, with three highly polished black stripes; mediotergite and pleura orange; femora yellow, the tips very narrowly dark brown; wings subhyaline, stigma pale, ill-delimited; no stigmal trichia; abdomen orange, the sev-

enth tergite and eighth sternite variegated by dark brown; male hypopygium with the inner dististyle without dorsal crest; eighth sternite gently emarginate medially, the broad lobes with sparse strong setæ; gonapophyses about twice as long as wide, the tips obtuse.

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

Frontal prolongation of head light brown, including nasus; palpi dark brown, the terminal segment brownish black. Antennæ with the basal three segments yellowish brown, the remainder black; flagellar segments very strongly incised, the outer swelling longer and almost as high as the basal enlargement; verticils shorter than the segments, those on ventral face of enlargement very short. Head deep fulvous-brown; occipital brand small, poorly differentiated from the ground; vertex with a reticulate pattern of delicate blackish lines; vertical tubercle entire.

Pronotum deep orange. Mesonotal præscutum deep orange, with three highly polished black stripes that are not bordered by a different color; lateral stripes straight but with a paler brown suffusion laterad of their anterior ends; scutum obscure yellow, each lobe with two confluent polished black areas; scutellum brown, the parascutella a little more orange; mediotergite dull orange, the posterior border with paired darker spots. Pleura dull orange-yellow, vaguely darker on ventral sternopleurite. Halteres dusky. Legs with the coxæ obscure yellow, with long conspicuous yellow setæ; trochanters yellow; femora yellow, the tips very narrowly and indistinctly darker brown; tibiæ brownish yellow, the tips narrowly darkened; tarsi black. Wings (Plate 1, fig. 12) subhyaline; cell Sc a little darker; stigma pale, ill-delimited, the caudal edge a trifle darker; veins brown. Stigma without trichia. Venation: Sc₂ ending opposite origin of Rs, Sc₁ represented by a spur; cell M₁ narrowly sessile; cell 1st M₂ gently widened outwardly; m-cu at fork of M₄, the latter a little basad of M₃.

Abdomen orange; tergites unmarked medially except for the seventh segment, which is blackened except laterally at base; a narrow but conspicuous brownish black stripe on lateral margins of tergites from segments two to four, inclusive; sternites yellow, unmarked, except for the basal third of the eighth sternite, which is dark brown; hypopygium orange-yellow. Male hypopygium with the ninth tergite (Plate 4, fig. 43, 9t) having strong sclerotized lateral horns, divergent, each with about three

black peglike spines on basal half of mesal face; lobes of tergite truncated, separated by a small U-shaped notch, their surface with abundant black spines and spinous setæ. Outer dististyle, *od*, of moderate size, the apical point short. Inner dististyle, *id*, without dorsal crest; apical beak long and slender; posterior margin of style with two powerful setæ, additional to the abundant pale normal setæ. Eighth sternite, 8s, with the caudal margin gently notched medially, the broad obtuse lobes with stronger and more abundant setæ, directed caudad and mesad. Gonapophyses, *g*, appearing as small flattened blades, oval in outline, about twice as long as wide and much shorter than the ædeagus, the tips obtuse.

Habitat.—Central Celebes (Bontoe Batoe District).

Holotype, male, Latimodjong Mountains, altitude 4,500 to 6,000 feet, May 25, 1931 (*Clagg*).

Among the more than one hundred described species of *Nephrotoma* in eastern Asia and the Malayan Islands, the present fly is best distinguished by the combination of small size, strongly binodose flagellar segments in the male, highly polished præscutal stripes, virtually immaculate mediotergite and pleura, lack of stigmal trichia, and the almost unmarked abdomen. The details of structure furnish additional characters to separate the fly from other regional small-sized members of the genus.

NEPHROTOMA PARASCUTELLATA sp. nov. Plate 1, fig. 13; Plate 4, fig. 44.

General coloration yellow; mesonotal præscutum with three black stripes, the lateral pair outcurved at anterior ends; scutellum yellow, parascutella black; mediotergite yellow, the posterior third blackened; orbital darkening appearing as elongate dashes; halteres black; legs black, the femoral bases narrowly yellow; wings subhyaline, the stigma and cells Sc and Cu₁ brownish black; intermediate abdominal segments yellow, with black posterior triangles, the outer segments and hypopygium black; eighth sternite of male hypopygium weakly emarginate.

Male.—Length, about 12 to 13 millimeters; wing, 10 to 10.5.

Female.—Length, about 15 millimeters; wing, 11.5 to 12.

Frontal prolongation of head obscure yellow, darker ventrally beneath and on sides; nasus and an adjoining area brownish black; palpi black. Antennæ with scape yellow; pedicel dark brown; flagellum black; antennæ (male) of moderate length, if bent backward extending about to root of halteres; flagellar segments moderately incised, with verticils that are shorter than

the segments. Head orange-yellow, clearer yellow in front; occipital brand small and only feebly differentiated from the ground; orbital darkenings appearing as elongate dashes extending from the narrowest point of the vertex caudad, gradually diverging from the eye margin.

Pronotum light yellow, the sides extensively blackened. Mesonotal præscutum yellow, more orange-yellow on interspaces; three black stripes, the surface feebly nitidous, the lateral stripes outcurved to margin; scutum broadly yellow medially, the lobes extensively black, the color extended laterad and including the outer ends of suture, restricting the lateral yellow areas of the præscutum to small spots before the suture; scutellum light yellow, the parascutella conspicuously black, contrasting markedly with the scutellum; mediotergite clear light yellow, with about the posterior third brownish black. Pleura yellow, the anepisternum and ventral sternopleurite more reddish; pleurotergite black on dorsal and ventral portions, isolating a central pale yellow area. Halteres black, the knobs not or scarcely brightened. Legs with the coxæ and trochanters yellow; femora black, the bases somewhat narrowly yellow, more extensive on the fore and middle legs where about the basal fourth or fifth is brightened, much narrower on posterior femora; tibiæ brownish black; tarsi black. Wings (Plate 1, fig. 13) subhyaline; cell Sc and the stigma brownish black; cell Cu₁ (between the approximated branches of Cu) darkened; veins brownish black. Stigmal trichia variable in number, in males ranging to 15 or 18; in female almost lacking. Venation: Sc₂ ending approximately opposite the origin of Rs; cell M₁ short-petiolate to barely sessile.

Abdomen with basal tergite chiefly black; tergites two to five yellow, with black posterior triangles; outer segments, including hypopygium, black; shield of ovipositor black. Male hypopygium with the lateral horns of tergite (Plate 4, fig. 44, 9*t*) short and entirely pale, earlike, with three or four small spinous points on base; median notch small. Outer dististyle, *od*, small, the apex little-attenuated. Inner dististyle, *id*, with apical beak stout; dorsal crest lacking or indicated only by a weak protuberance; setæ of style short but black and conspicuous. Eighth sternite with median area gently emarginate, the broadly rounded lateral lobes with long pale yellow setæ.

Habitat.—West Java.

Holotype, male, Mount Malang, altitude 3,000 feet, August, 1933 (*Walsh*). Allotype, female, Buitenzorg, December, 1930

(*Handschin*), in the Natural History Museum, Basel, Switzerland. Paratopotypes, males, with the holotype.

The present fly bears a general resemblance to species such as *Nephrotoma doleschalli* (Osten Sacken) and *N. javana* (Wiedemann), but is unquestionably distinct from these and other regional species. The most characteristic features lie in the nature of the orbital darkenings, the black parascutella, the dark halteres and legs, and the pattern of the abdomen, with all outer segments, including hypopygium, blackened.

NEPHROTOMA MERACA sp. nov. Plate 1, fig. 14; Plate 4, fig. 45.

General coloration yellow, the præscutum with three polished black stripes, the lateral pair outcurved; antennæ bicolorous, with the bases of the flagellar segments reddish yellow, the remainder black; occipital brand large and conspicuous, more or less heart-shaped; a central dark longitudinal stripe on mediotergite; apices of knobs of halteres yellowish white; femora yellow, the tips narrowly but conspicuously blackened, the amount subequal on all legs; wings subhyaline, the stigma dark brown; wing tip and cord narrowly darkened; abdominal tergites yellow, with three broken black stripes; terminal segments darkened; male hypopygium with a long rectangular lobe from beneath the eighth sternite, its apex with a rounded notch.

Male.—Length, about 9 millimeters; wing, 9; antenna, about 5.

Frontal prolongation of head light yellow, the nasus and a small adjacent area blackened; palpi with basal segment obscure yellow; succeeding segments brown, terminal segment yellow. Antennæ moderately elongate; scape yellow, pedicel brown; basal flagellar segment black; flagellar segments beyond the first bicolored, the basal enlargement reddish yellow, the remainder black; outer segments more uniformly darkened; flagellar segments moderately incised; verticils shorter than the segments. Head yellow, the occipital brand large and conspicuous, more or less heart-shaped.

Pronotum yellow medially, broadly brownish black on sides. Mesonotal præscutum obscure yellow, with three polished black stripes that are not bordered by darker; lateral stripes outcurved, but the bent portion paler than the stripe itself; scutum yellow, each lobe with two black areas, the more anterior extended laterad along the suture; scutellum and parascutella obscure yellow; mediotergite yellow, with a faint median darkening, in type restricted to cephalic portion, in paratype continuous.

Pleura pale yellow, indistinctly variegated by more reddish areas on anepisternum and ventral sternopleurite. Halteres brownish yellow, the base of knob darkened, the apex broadly yellowish white. Legs with the coxæ orange, the base of fore coxa narrowly darkened; trochanters obscure yellow; femora yellow, the tips very indistinctly darkened; tarsi black. Wings (Plate 1, fig. 14) relatively broad, subhyaline; stigma oval, dark brown; a narrow brown seam on anterior cord; wing tip obtuse, narrowly margined with brown; a very narrow brown seam on vein M_4 to margin; other veins beyond cord less distinctly seamed; cell Sc entirely clear; veins brown. Only about four stigmal trichia. Venation: Sc relatively long, Sc_2 ending about opposite one-third the length of the relatively long Rs, Sc_1 indicated by a spur; cell M_1 sessile; m-cu at fork of M_4 , the latter some distance before fork of M_3 .

Abdomen yellow, the tergites with three broken black stripes, interrupted at basal portions of segments; caudal end of seventh tergite, eighth segment, and part of ninth segment black; remainder of hypopygium light brown; sternites yellow, the seventh and eighth segments blackened. Male hypopygium with the ninth tergite (Plate 4, fig. 45, 9t) having caudal border with two broadly truncated lobes, the dorsal surface on either side elevated into blackened mounds, the median portion more reddish. Outer dististyle, *od*, yellow, the tip obtuse. Inner dististyle, *id*, with the beak very obtuse. From beneath the eighth sternite projects a small, long-rectangular, pale lobe, 8s, its apex with a small circular notch. Gonapophyses greatly reduced so as to be virtually lacking.

Habitat.—Kashmir.

Holotype, male, Baltistan, altitude 10,000 feet, June, 1934 (*Hutchinson*); came to light in tent in willow grove near glacier. Paratopotype, male.

The only other regional species having the coloration of the antennæ approximately as in the present fly is *Nephrotoma puncticornis* (Brunetti), of the eastern Himalayas, which is entirely different in the coloration of the head and body, having the præscutal stripes straight and the mediotergite bright light yellow, while the abdomen is chiefly yellow.

NEPHROTOMA TRILOBULATA sp. nov. Plate 1, fig. 15; Plate 4, fig. 46.

General coloration yellow, variegated with black; antennal flagellum black, the segments only weakly incised; a small dark spot before antennal bases; occipital brand large; lateral præ-

scutal stripes outcurved at anterior ends; wings yellowish subhyaline; stigma pale, only a little darker than the ground; cell Sc undarkened; stigmal trichia sparse; vein Sc₂ ending opposite origin of Rs; abdomen orange-yellow, the tergites interruptedly trivittate with black; hypopygium pale; male hypopygium with a depressed rectangular lobe from beneath the posterior margin of the eighth sternite, its apex trilobulate.

Male.—Length, 12.5 to 13 millimeters; wing, 11 to 12.

Female.—Length, about 15 to 16 millimeters; wing, 12.5 to 14

Frontal prolongation of head orange-yellow, the long nasus and a dorsal suffusion of the prolongation pale brown; palpi dark brown, the terminal segment somewhat paler. Antennæ with scape orange, remainder of organ black; flagellar segments only weakly incised; verticils shorter than the segments. A small bright brown triangular area on front before the antennal bases; posterior region of head orange, the orbits and genæ yellow; occipital brand large and conspicuous, shiny, narrowly bordered by opaque, in cases the anterior end sending a more or less entire prolongation to summit of tubercle; a very small and indistinct dark spot on anterior orbit opposite the narrowest point of vertex.

Pronotum yellow medially, conspicuously black on sides. Mesonotal præscutum yellow, with three polished black stripes, the lateral pair outcurved; median stripe crossing the suture behind; scutum yellow, the lobes conspicuously variegated with black, sending a narrow line across the suture and connecting with the lateral præscutal stripes; scutellum brown, parascutella yellow, narrowly blackened on mesal portion adjoining the scutellum; mediotergite pale yellow, with a median dark area that is narrower but darker on cephalic half of sclerite, on posterior half expanded and paling to light brown. Pleura sulphur yellow on anepisternum and sternopleurite, variegated with reddish brown areas; propleura and posterior sclerites of mesopleura more china white; a linear black area on suture between the anepisternum and sternopleurite. Halteres dark brown, the base of stem narrowly reddish, the apex of knob sulphur yellow. Legs with the coxæ yellow, the fore and middle coxæ more variegated with reddish; trochanters yellow; femora orange-yellow, the tips very narrowly and insensibly darkened; tibiæ light brown, passing into brownish black; tarsi black. Wings (Plate 1, fig. 15) yellowish subhyaline; stigma pale, only a little darker than the ground; cell Sc scarcely darker than cell C; veins brown. Stig-

mal trichia about six in number. Venation: Sc_2 ending opposite origin of R_s , Sc_1 preserved; cell M_1 narrowly sessile to short-petiolate; m-cu just before fork of M_4 .

Abdomen orange-yellow, the tergites narrowly trivittate with black, the stripes interrupted at posterior border of each segment; outer segments almost uniformly pale, the outer end of the seventh tergite and basal portion of the eighth infuscated; hypopygium pale. Male hypopygium with the tergite (Plate 4, fig. 46, 9t) bearing two divergent lobes, separated by a V-shaped notch, the margins of the lobes provided with a series of blackened points and spinous setæ. Outer dististyle, *od*, moderately attenuated. Inner dististyle, *id*, with the apical beak slender; dorsal crest low. From beneath the caudal margin of the eighth sternite a rectangular depressed lobe, $8s$, its apex trilobulate, the lateral lobules a little longer and more slender than the median one.

Habitat.—Kashmir.

Holotype, male, Baltistan, altitude 9,000 feet, June 20, 1934 (*Hutchinson*). Allotopotype, female, pinned with type. Paratopotype, 1 male; paratype, 1 female, altitude 10,000 feet, June 14, 1934.

Apparently most closely allied to *Nephrotoma consimilis* (Brunetti), which differs conspicuously in the small occipital brand, chiefly blackened femora, darkened terminal segments of abdomen, and structure of the hypopygium. It is evident that Brunetti had at least two species confused in the type series and original description of *consimilis*. I possess several paratype and metatype specimens received from Mr. Brunetti and am basing the above comparison upon paratypical material.

NEPHROTOMA IRREVOCATA sp. nov. Plate 1, fig. 16; Plate 4, fig. 47.

General coloration yellow, variegated by black; frontal prolongation of head with a narrow black median stripe; terminal segment of palpus yellow; antennal flagellum black; lateral præscutal stripes decurved; mediotergite with an inverted T-shaped brown area; knobs of halteres sulphur yellow; fore femora chiefly black, the remaining femora yellow, narrowly tipped with black; wings subhyaline, cell Sc and the stigma darkened; abdominal tergites orange-yellow, with three narrow black stripes, the seventh to ninth segments black; male hypopygium with the lateral horns of tergite small and acute, without spines; gonapophyses elongate.

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

Frontal prolongation of head yellow; nasus and a narrow but complete line on dorsum brownish black; palpi testaceous-yellow, the basal three segments in cases somewhat darker. Antennæ with scape and pedicel brownish yellow, flagellum black; flagellar segments moderately incised; verticils a little shorter than the segments. Front sulphur yellow, posterior portion of head more orange; occipital brand of moderate size, dark brown, sending an anterior prolongation part way up the high vertical tubercle; a more or less evident dark spot on anterior orbit at narrowest point of vertex.

Pronotum pale yellow, dark brown on sides. Mesonotal præscutum yellow, with three polished black stripes that are not or scarcely bordered by duller black; lateral stripes outcurved to margin, the decurved portion variable in intensity, in cases much paler than the stripes; scutum yellow, each lobe virtually covered by a large black area that follows the suture to the lateral border; scutellum pale brown, the parascutella yellow; mediotergite yellow, with an inverted T-shaped brown area, the crossbar sometimes paler than the stem. Pleura yellow, variegated by reddish on anepisternum, ventral sternopleurite, and meron; a brown or black dash on posterior portion of anepisternum. Halteres dusky, the base of stem narrowly reddish, the knobs chiefly bright sulphur yellow. Legs with the coxæ whitish, with more or less distinct reddish tinges; trochanters yellow; fore femora chiefly black, the basal third yellow; middle and hind femora yellow, the tips narrowly black, the amount involving about the distal eighth or less; tibiæ dark brown, the tips narrowly darker; tarsi black. Wings (Plate 1, fig. 16) subhyaline or with a very faint dusky tinge; cell Sc uniformly darkened; stigma dark brown; cell Cu_1 and wing tip less clearly darkened; veins dark brown. Stigmal trichia scanty, six to eight in number. Venation: Cell M_1 sessile; m-cu a short distance before fork of M_4 .

Abdominal tergites orange-yellow, with three narrow black stripes, more or less interrupted at the incisures, in male with the seventh and succeeding segments intense black, only the outer dististyle pale yellow; impressed areas on basal rings of tergite distinct, confluent with the median dark stripe. Male hypopygium with the tergite (Plate 4, fig. 47, 9t) small, the caudal margin concave, with a submedian lobe on either side, the notch between long and narrow; margins of lobes set with microscopic blackened points and setæ; a smooth acute yellow blade on either

side of caudal portion; dorsal setæ restricted to posterior half of sclerite. Styli, *id*, *od*, as figured. Gonapophyses, *g*, long and slender, the distal half somewhat narrower than the base. Eighth sternite entire, with a small, pale, fleshy lobule protruding from beneath its margin.

Habitat.—Kashmir.

Holotype, male, Baltistan, altitude 10,000 feet, June, 1934 (*Hutchinson*). Paratopotypes, 2 males, with the type; 1 male, altitude 10,000 feet, June 22, 1934; 2 males, altitude 9,000 feet, June 19, 1934; 1 male, altitude 8,000 feet, June 19, 1934; came to light in tent at 8 p. m., at camp beside Dras River (*Hutchinson*).

By means of keys to the regional species of *Nephrotoma*, the present fly runs to *N. consimilis* (Brunetti) and *N. virgata* (Coquillett). The former differs conspicuously in the strongly tinted wings, with pale stigma and cell Sc, together with an entirely different male hypopygium. *Nephrotoma virgata* likewise has the stigma and cell Sc pale and with the hypopygium quite distinct in all details, more notably in the straplike appendage from behind the eighth sternite.

LIMONIINÆ

LIMONIINI

LIMONIA (LIMONIA) PROTRUSA sp. nov. Plate 1, fig. 17.

Rostrum yellow; antennæ relatively elongate; flagellum black; mesonotal præscutum with entire disk covered by a brownish black shield, the humeral region obscure yellow; legs dark brown; wings with a strong brown tinge; stigma long-oval, darker brown; Sc₁ ending about opposite two-thirds the length of Rs, Sc₂ at its tip; R₁₊₂ jutting far beyond level of free tip of Sc₂ and R₂, which are both pale and lie in approximate transverse alignment; vein Sc₂ + R₁ bending strongly caudad as it enters the region of the stigma; m-cu at fork of M; abdominal tergites brownish black, the sternites somewhat paler with the bases of the segments narrowly darker.

Female.—Length, about 6 millimeters; wing, 6.8.

Rostrum yellow; palpi black. Antennæ with scape and pedicel obscure brownish yellow; flagellum black; antennæ relatively elongate (for female sex); flagellar segments cylindrical, with short apical pedicels; terminal segment about one-third longer than the penultimate. Head dark gray.

Pronotum reduced, yellow, becoming darker on sides. Mesonotal præscutum with the disk chiefly covered by a brownish

black shield, the humeral region obscure yellow; scutal lobes dark brown, the median area vaguely brightened; posterior sclerites of mesonotum dark brown. Pleura with dorsal half darker brown than the ventral yet not forming a dorsal stripe, the suffusion chiefly appearing on the ventral anepisternum. Halteres dusky, the base of stem restrictedly pale. Legs with the fore coxæ darker than the other coxæ; trochanters obscure yellow; remainder of legs dark brown, the femoral bases very restrictedly pale. Wings (Plate 1, fig. 17) with a strong brown tinge; stigma long-oval, darker brown; veins brown R_2 and the free tip of Sc_2 pale and without trichia. Venation: Sc long, Sc_1 ending about opposite two-thirds the length of Rs , Sc_2 close to its tip; R_{1+2} projecting beyond free tip of Sc_2 as a long spur that is provided with about a dozen trichia; free tip of Sc_2 and R_2 virtually in transverse alignment; vein $Sc_2 + R_1$ bending strongly caudad as it enters the region of the stigma; inner end of cell 1st M_2 slightly arcuated; m-cu at fork of M ; anal veins convergent near origin, 2d A weakly sinuous.

Abdominal tergites brownish black, the sternites a trifle paler, with the bases of the intermediate segments rather narrowly darker; cerci very slender, the tips simple; hypovalvæ horn-yellow, the bases blackened.

Habitat.—China (Chekiang).

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

The peculiar venation of the radial field, with vein R_{1+2} jutting far beyond the free tip of Sc_2 , is a very uncommon condition in the typical subgenus, in the local fauna being found only in *Limonia* (*Limonia*) *monacantha* Alexander, which is entirely distinct in the conspicuously patterned wings.

LIMONIA (LIMONIA) LATICELLULA Alexander.

Limonia (*Limonia*) *laticellula* ALEXANDER, Philip. Journ. Sci. 49 (1932) 381-382.

Described from Szechwan, western China, altitude 6,000 to 11,000 feet, July, 1931 (*Franck*). Three males and females, near Bandapur, Kashmir, altitude 7,000 feet, November 4, 1934, flying beneath fir trees (*Hutchinson*).

LIMONIA (LIMONIA) HOSTILIS Alexander.

Limonia (*Limonia*) *hostilis* ALEXANDER, Philip. Journ. Sci. 51 (1933) 533-534.

Described from the Szechwan-Tibet border, at high altitudes, August 3 to 6, 1930 (*Graham*). Several males and females,

Mount Omei, Szechwan, altitude 10,800 to 11,000 feet, August 16 to 20, 1934 (*Graham*). One female, Bitzal Nullah, western Karakorams, Kashmir, altitude 14,000 feet, September 2, 1934 (*Hutchinson*).

LIMONIA (DICRANOMYIA) TRICUSPIDATA sp. nov. Plate 1, fig. 18; Plate 4, fig. 48.

Allied to *immodestoides*; general coloration grayish brown; knobs of halteres darkened; femora and tibiae pale brown, the tarsi brownish black; wings subhyaline, the short-oval stigma pale brown; Sc_1 longer than R_s ; cell 1st M_2 open by atrophy of m ; vein M_{3+4} longer than M_4 ; male hypopygium with the caudal margin of tergite deeply emarginate; ventral dististyle large and fleshy, its rostral prolongation with three subequal spines near base.

Male.—Length, about 6 millimeters; wing, 6.8 to 7.

Female.—Length, about 6 millimeters; wing, 7.

Rostrum brownish yellow to brown, the palpi only a little darker. Antennae short, black throughout; flagellar segments short-oval, the outer segments somewhat longer; terminal segment approximately one-half longer than the penultimate. Head dark brownish gray.

Pronotum dark medially, paler on sides. Mesonotal praescutum dark grayish brown medially, the humeral region brighter; scutal lobes darkened, the median region paler; posterior sclerites of notum grayish brown. Pleura chiefly darkened, pruinose. Halteres pale, the knobs infuscated. Legs with the coxae and trochanters pale yellow; femora and tibiae pale brown; tarsi brownish black. Wings (Plate 1, fig. 18) subhyaline, the short-oval stigma pale brown; veins dark brown. Venation: Sc_1 ending opposite origin of R_s , Sc_2 far back from its tip, Sc_1 exceeding R_s in length; free tip of Sc_2 lying just proximad of R_2 ; cell 1st M_2 open by the atrophy of m ; M_{3+4} longer than vein M_4 ; $m-cu$ at or shortly before fork of M .

Abdominal tergites brown, the sternites obscure yellow, the incisures very vaguely and narrowly more darkened. Male hypopygium (Plate 4, fig. 48) with the tergite, 9t, deeply emarginate, the lobes with numerous setae. Basistyle, b , with the ventromesal lobe long and conspicuous, densely setiferous. Ventral dististyle, vd , large and fleshy, the rostral prolongation with three subequal spines near base, these placed rather close together, not from enlarged basal tubercles. Ovipositor with the cerci very slender, upcurved.

Habitat.—Kashmir.

Holotype, male, Doku, Baltistan, altitude 10,000 feet, September 9, 1934 (*Hutchinson*). Allotopotype, female. Paratopotype, female; paratype, male, Skardu, altitude 7,000 feet, September 10, 1934 (*Hutchinson*).

Limonia (*Dicranomyia*) *tricuspidata* is most nearly related to *L. (D.) immodestoides* (Alexander), widely distributed in eastern Asia, differing especially in the somewhat longer vein Sc, and in the structure of the male hypopygium, as the elongate ventromesal lobe of the basistyle and the trispinous prolongation of the ventral dististyle. *Limonia (D.) patens* (Lundström), of northern Europe and eastern Siberia, is likewise a member of this group, yet very different from the two species above-mentioned. *Limonia (D.) absens* (Brunetti), of the eastern Himalayas, differs in the coloration of the body and legs and in the more elongate cell M_3 of the wings, this being nearly twice as long as its petiole. This latter species is still known only from the female sex.

LIMONIA (DICRANOMYIA) BIFUSIFERA (Edwards).

Dicranomyia bifusifera EDWARDS, Ann. & Mag. Nat. Hist. IX 20 (1927) 225-226.

Described from a unique male taken in Kashmir, without exact locality, altitude 11,000 to 13,000 feet, collected by Mitchell. Five males, Pulwar Nullah, Kashmir, altitude 11,000 feet, October 8, 1934 (*Hutchinson*).

These specimens differ somewhat from Edwards's description in the details of coloration and venation, but the peculiar hypopygium is identical, and I have little doubt of the determination. General coloration of the entire thorax dark gray. Legs brown to brownish black, the femoral bases brighter. Wings with Sc_1 much shorter than Rs, somewhat variable in the present series, ranging from one-third to one-fifth the length of Rs.

ANTOCHA (ANTOCHA) PICTURATA sp. nov. Plate 1, fig. 19.

Mesonotal præscutum reddish, with a gray pruinosity; a median brown stripe on præscutum; halteres and legs pale; wings milky white, with a handsome, pale gray, clouded pattern, including clouds in cells R, M, and R_3 ; vein R_2 in transverse alignment with r-m; cell 1st M_2 relatively small; m-cu shortly before fork of M.

Female.—Length, 5 to 5.5 millimeters; wing, 4.5 to 5.

Rostrum and palpi brownish black. Antennæ black, the pedicel a little paler; flagellar segments short-oval. Head dark gray.

Mesonotal præscutum reddish, with a gray pruinosity; a median brown stripe on præscutum, becoming obsolete before the suture; posterior sclerites of notum gray, the scutellum paler. Pleura chiefly brownish yellow. Halteres pale. Legs with the coxæ and trochanters yellow; remainder of legs chiefly yellow, only the terminal tarsal segments more darkened. Wings (Plate 1, fig. 19) milky white, with a handsome, pale gray, clouded pattern, including the stigma, cord, outer end of cell 1st M_2 , all of vein 2d A, and distal third of 1st A; clouds in cells R and M opposite the origin of Rs, and near the outer end of cell R_3 ; veins pale, darker brown in the clouded areas. Venation: R_2 in transverse alignment with r-m; cell 1st M_2 relatively small, the second section of vein M_{1+2} shorter than the last section; m-cu shortly before the fork of M.

Abdomen pale brown to brownish yellow, the posterior borders of the segments restrictedly paler.

Habitat.—China (Szechwan).

Holotype, Gehang, October 5, 1934 (*Franck*). Paratopotype, female.

The handsomely patterned wings readily separate the present fly from all regional species, excepting *Antocha* (*Antocha*) *bifida* Alexander, A. (A.) *nebulosa* Edwards, and A. (A.) *nebulipennis* Alexander. The more-involved and complicated wing pattern and the uniformly pale yellow legs readily distinguish the present fly.

ORIMARGA (ORIMARGA) BASALIS sp. nov. Plate 1, fig. 20.

General coloration gray; rostrum and base of scape reddish; halteres whitish throughout; femora pale brown, with a slightly indicated, darker brown, subterminal ring; wings pale yellow, veins yellow, Cu and 2d A darker; R_{2+3} elongate, subequal to Rs; m-cu lying unusually far basad, opposite origin of Rs.

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

Female.—Length, about 7.5 to 8 millimeters; wing, 6.3 to 7.

Rostrum reddish; palpi a little darker. Antennæ with basal portion of scape reddish, the remainder of organ black; flagellar segments oval, the outer ones a trifle more elongate, with short verticils. Head gray, slightly more brownish gray behind.

Mesonotum gray, in cases with the præscutum having indistinct more brownish lines on the interspaces. Pleura more or less pruinose, especially the dorsal portion, the ventral region paler and, in cases, more reddish. Halteres whitish throughout. Legs with the coxæ and trochanters pale; femora pale brown or yellowish brown, becoming narrowly darker just before the pale

tips; in cases, the femora are more evenly and generally darkened; tibiæ and tarsi darker brown. Wings (Plate 1, fig. 20) almost uniformly pale yellow, the prearcular field whitened; axillary region narrowly darkened; veins yellow, Cu, 2d A, and basal portion of 1st A darker. Macrotrichia of veins beyond cord abundant, there being a series of more than thirty on vein R_3 . Venation: Sc relatively long, Sc_1 ending a short distance before fork of Rs, Sc_2 near its tip; R_{2+3} elongate, subequal to or only a little shorter than Rs and exceeding twice R_{1+2} alone; basal section of R_{4+5} long, exceeding R_{1+2} ; r-m lying a short distance basad of R_2 ; m-cu lying unusually far basad, opposite the extreme basal portion of Rs.

Abdominal tergites dark brown, the sternites a trifle paler, more yellowish brown.

Habitat.—Kashmir.

Holotype, male, Skardu, altitude 7,000 feet, July 12, 1934, in marshy area, associated with *Gonomyia* (*Ptilostena*) *reticulata* Alexander (*Hutchinson*). Allotopotype, female. Paratopotypes, males and females, altitude 7,000 to 7,700 feet, July 3 to 12, 1934 (*Hutchinson*).

All species of *Orimarga* hitherto made known from British India and the Himalayas have vein R_{2+3} short, less than one-third the length of Rs. The present fly is most closely allied to certain species from Japan and western China, such as *Orimarga* (*Orimarga*) *formosicola* Alexander, *O.* (*O.*) *omeina* Alexander, *O.* (*O.*) *pruinosa* Alexander, and *O.* (*O.*) *yakushimana* Alexander, differing from all in the pattern of the femora and the position of m-cu opposite the extreme base of Rs. thus making the second section of vein M of unusual length.

HEXATOMINI

PSEUDOLIMNOPHILA APICINIGRA sp. nov. Plate 1, fig. 21.

General coloration of head and thorax gray; antennæ with scape dark brown, the pedicel a little paler; basal segment of flagellum obscure brownish yellow; outer flagellar segments cylindrical, with long conspicuous verticils that much exceed the segments in length; præscutum with two intermediate darker gray stripes that are separated by a capillary brown vitta; femora obscure yellow, the tips narrowly blackened; wings yellowish brown, the small stigma pale brown; R_{1+2} longer than the strongly erect R_{2+3+4} ; R_{2+3} a little shorter than R_{2+3+4} ; cell M_1 about twice its petiole; m-cu a little proximad of r-m; anterior

arculus preserved; abdominal tergites dark brown, the sternites yellowish.

Male.—Length, about 8.5 millimeters; wing, 8.

Female.—Length, about 9 to 10 millimeters; wing, 8.5 to 9.

Rostrum and palpi dark brown. Antennæ with the scape dark brown; pedicel a little paler; basal segment of flagellum obscure brownish yellow to brown; remaining segments passing into black; outer flagellar segments cylindrical, with long conspicuous verticils that much exceed the segments in length. Head gray; anterior vertex wider than the diameter of scape.

Mesonotal præscutum gray, with indications of two darker gray submedian stripes and more brownish lateral stripes; intermediate stripes separated by a capillary brown vitta; pseudosutural foveæ and tuberculate pits black; posterior sclerites of notum gray. Pleura gray. Halteres pale, the knobs weakly infumed. Legs with the coxæ and trochanters pale yellow; femora obscure yellow, the tips narrowly but conspicuously blackened, the amount subequal on all legs; tibiæ light brown, the tips very narrowly infuscated; basitarsi brown, the tips brownish black; outer tarsal segments black. Wings (Plate 1, fig. 21) with a strong yellowish brown tinge, the costal and prearcular regions, together with cell Cu_1 , somewhat more yellowish; stigma very small and pale, scarcely differentiated; veins brown. Macrotrichia of veins abundant and of moderate length. Venation: Sc_1 ending nearly opposite fork of R_s , Sc_2 a short distance from its tip; R_1 incrassated opposite R_2 ; R_{1+2} longer than the strongly erect R_{2+3+4} ; R_{2+3} a little shorter than R_{2+3+4} ; cell M_1 about twice its petiole; m-cu lying a little proximad of r-m, not far beyond fork of M ; anterior arculus preserved.

Abdominal tergites dark brown; sternites yellowish.

Habitat.—Kashmir.

Holotype, male, Skardu, altitude 7,700 feet, July 3, 1934 (*Hutchinson*). Allotopotype, female. Paratopotype, female.

In the suberect vein R_{2+3+4} the present fly is rather similar to the Japanese *Pseudolimnophila erecta* Alexander, an otherwise very different species, having R_{1+2} short and m-cu beyond mid-length of cell 1st M_2 . The Indian species that are most closely allied are *P. fusca* (Brunetti) and *P. pallidicoxa* (Brunetti), from both of which the present fly is readily told by the gray coloration of the head and thorax, the uniformly pale abdominal sternites, and the black-tipped femora. As indicated by Ed-

wards ⁴ the species *pallidicoxa* was evidently founded on a mixture of two genera and the identity of the holotype specimen is in doubt. A paratype in my collection, which seems to agree well with Brunetti's conception of the species in 1912, when the insect was described (but not in 1918, when Brunetti keyed the Oriental species of the group and gave a figure of *pallidicoxa* as he then construed the species) is evidently allied to the present fly, but differs venationally in the longer and less erect R_{2+3+4} and the smaller cell 1st M_2 .

HEXATOMA (ERIOCERA) LUXURIOSA sp. nov. Plate 1, fig. 22.

Belongs to the *nepalensis* group; mesonotal præscutum in front fiery orange, scutum and parascutella brownish black, mediotergite dull yellow; pleura uniformly dark liver brown; antennæ and legs dark brown; wings dark brown, the anal cells paler; a conspicuous white discal area before the cord; R_2 transverse, R_{1+2} subequal to R_{2+3} ; cell M_1 lacking; m-cu near outer end of cell 1st M_2 ; abdomen black, the basal rings of segments two to six (female) and two to seven (male) polished nacreous; genital segment of female orange; male hypopygium black; subterminal segments in male expanded into a weak spatula.

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

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

Rostrum black; palpi brownish black. Antennæ brownish black throughout. Head dull black; vertical tubercle small, with a lower, less evident tubercle immediately in front of it.

Prothorax dark liver brown. Mesonotal præscutum in front and on sides deep fiery orange, becoming more infuscated behind; scutum and parascutella dark brown or brownish black; scutellum obscure orange; mediotergite dull yellow, unmarked. Pleura and pleurotergite, including dorsopleural membrane, uniformly dark liver brown, unmarked. Halteres dark brown. Legs dark brown throughout, femoral bases unbrightened. Wings (Plate 1, fig. 22) almost uniformly suffused with dark brown, including the prearcular field and costal region; anal cells paler, except as a seam along vein 2d A; a conspicuous white area before the cord, including cells R_1 , R, and M, not quite reaching veins R_1 and Cu, the distal edge reaching the fork of Rs, a little wider in cells R and M; veins brown, yellow in the

⁴ Rec. Indian Mus. 26 (1924) 302.

white discal band. Macrotrichia of veins beyond cord small and sparse, or lacking. Venation: Sc_1 ending shortly before R_2 , the latter transverse; R_{1+2} subequal to or longer than R_{2+3} ; cell M_1 lacking; m-cu near outer end of cell 1st M_2 .

Abdomen dull black, segments two to six (female) and two to seven (male) with the basal rings polished nacreous; outer segments in male more uniformly dull black; ovipositor and genital segment fiery orange; in male, segments five to seven gently expanded into a weak spatula, hypopygium black.

Habitat.—Siam.

Holotype, male, Chieng-mai, October 25, 1920; American Museum of Natural History F 4564; accession No. 22,628. Allotopotype, female, F 4560, in author's collection.

By Edwards's key to the Old World species of *Eriocera*⁵ the present fly runs to *Hexatoma* (*Eriocera*) *fenestrata* (Brunetti), which differs in various details of coloration of the thorax and wings. None of the species more recently defined by Edwards and the present writer is more nearly allied to the present insect.

ERIOPTERINI

GONOMYIA (PTILOSTENA) RETICULATA Alexander.

Gonomyia (*Ptilostena*) *reticulata* ALEXANDER, Bull. Mus. Hist. Nat. Paris, for 1921 (1921) 305-306.

The unique type and hitherto only known specimen was from the Gobi Desert, Mongolia, altitude 1,000 to 2,000 meters, collected in June, 1909, by Dr. L. Vaillant. Five males and females, Skardu, Kashmir, altitude 7,700 feet, July 3 to 12, 1934, and 7,000 feet, September 9 and 10, 1934 (*Hutchinson*); at light, and swept from a swampy area where it was associated with *Orimarga* (*Orimarga*) *basalis* sp. nov. and *Pseudolimnophila apicinigra* sp. nov.

The type was badly discolored and the following supplementary notes are given:

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

Female.—Length, 7 to 8 millimeters; wing, 7 to 8.5.

General coloration of thorax gray; præscutum with two intermediate dark brown stripes; humeral region restrictedly yellow; pseudosutural foveæ black, conspicuous; scutal lobes variegated by dark brown spots. Pleura gray, with a broken yellow

⁵ Ann. & Mag. Nat. Hist. IX 8 (1921) 70-78.

longitudinal stripe that includes the ventral anepisternum, and, in cases, the metapleura; pteropleurite darkened.

ERIOPTERA (ERIOPTERA) PALLICLAVATA sp. nov. Plate 1, fig. 23; Plate 4, fig. 49.

General coloration pale yellow; antennæ, legs, and halteres pale throughout; wings pale yellowish subhyaline, the veins a trifle darker yellow; male hypopygium with the outer dististyle slender, produced into a pale, toothlike lobe at base; gonapophyses appearing as simple darkened blades.

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

Rostrum pale; palpi black. Antennæ pale throughout. Head pale yellow; eyes (male) of normal size.

Mesonotum uniformly pale yellow to testaceous-yellow; pleura paler yellow. Halteres white throughout. Legs with the coxæ and trochanters pale yellow; remainder of legs yellow, the terminal tarsal segments passing into dark brown. Wings (Plate 1, fig. 23) pale yellowish subhyaline, the veins a trifle darker yellow; macrotrichia light brown. Venation: Sc_1 ending just before R_2 , Sc_2 , not evident in the unique type; distal end of vein Cu_1 deflected suddenly cephalad; vein 2d A very strongly bent at midlength, the outer half paralleling the posterior border of wing.

Abdomen pale brownish yellow, the lateral borders a little darkened. Male hypopygium (Plate 4, fig. 49) with a small subapical lobe on mesal face of basistyle, *b*, near apex. Outer dististyle, *od*, slender, with a pale toothlike extension at base, the apex a trifle enlarged and darkened. Inner dististyle, *id*, strongly twisted at near two-thirds the length, the apex a narrowly darkened spine. Gonapophyses, *g*, appearing as simple darkened blades.

Habitat.—Kashmir.

Holotype, male, Minimarg, September 14, 1934 (*Hutchinson*).

By Brunetti's key to the Indian species of *Erioptera*⁶ the present fly runs to *Erioptera flava* Brunetti (preoccupied, re-named *bengalensis* Alexander), which belongs to the subgenus *Meterioptera*. The present fly is a true *Erioptera*, apparently most nearly allied to *E. (E.) xanthoptera* Alexander,⁷ of northern Japan. The latter species, still known only from the female sex, is dark brown, with the wings more strongly suffused with

⁶ Brit. India, Diptera Nematocera (1912) 448–449.

⁷ Philip. Journ. Sci. 24 (1924) 582.

yellow. Among the European species, the present fly is most generally similar to *E. (E.) flavescens* (Linnæus) and *E. (E.) meijerei* Edwards, differing conspicuously in the structure of the male hypopygium.

ORMOSIA SECLUSA sp. nov. Plate 1, fig. 24; Plate 4, fig. 50.

Mesonotum varying from reddish brown to gray, the pleura gray; halteres pale yellow throughout; wings with a brown tinge, the prearcular and basal costal regions more yellowish; cell M_2 open by the atrophy of the basal section of M_3 ; veins M_3 and m not angulated at point of union; vein 2d A sinuous on outer third; male hypopygium with the gonapophyses appearing as long slender black spines, each with two or three smaller spines near tip and with a long slender spine on outer face at near mid-length.

Male.—Length, about 4 to 4.3 millimeters; wing, 5 to 5.5.

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

Rostrum and palpi black. Antennæ brownish black, of moderate length in male, if bent backward ending before wing root. Head dark gray.

Pronotum and mesonotum varying in color in different specimens, in some grayish brown to darker gray, in others more reddish brown; humeral triangle restrictedly brightened. Pleura brownish gray. Halteres pale yellow throughout. Legs with the coxæ dark reddish brown; trochanters obscure yellow; femora yellow basally, passing into yellowish brown; tibiæ obscure yellow, the tarsi passing into dark brown. Wings (Plate 1, fig. 24) with a brown tinge, the prearcular and basal costal regions more yellowish; stigmal region slightly darker brown; veins stout, pale brown, indistinctly seamed with brown. Venation: R_{2+3+4} and R_{2+3} subequal, a trifle exceeding R_2 alone; cell M_2 open by atrophy of basal section of M_3 ; m and outer section of M_3 not angulated at point of union; $m-cu$ at or just before fork of M ; vein 2d A sinuous on outer third.

Abdomen dark brown, the hypopygium a little brighter. Male hypopygium (Plate 4, fig. 50) with the ninth tergite, $9t$, relatively narrow. Basistyle, b , not produced. Outer dististyle, od , a small, earlike structure, set with abundant appressed microscopic setulæ. Inner dististyle, id , with the apex narrowed into a slender curved sclerotized arm, the notch filled with pale membrane. Gonapophyses, g , appearing as long slender black spines, each with two or three smaller appressed spines on outer

margin back from tip, and a longer slender black spine more basal in position at near midlength of the outer face of the apophysis.

Habitat.—Japan (Honshiu).

Holotype, male, Konseitoge, Shimotsuke, altitude 7,000 feet, August 6, 1934 (*Issiki*). Allotype, female, pinned with type. Paratopotypes, 3 males and females.

The structure of the male hypopygium, and especially of the peculiarly formed gonapophyses, is very different from that of all allied regional species of *Ormosia*, such as *O. takahashii* Alexander and *O. takeuchii* Alexander.

ILLUSTRATIONS

[a, *Ædeagus*; b, *basistyle*; c, *cercus*; d, *dististyle*; g, *gonapophysis*; id, *inner dististyle*; od, *outer dististyle*; s, *sternite*; t, *tergite*; vd, *ventral dististyle*.]

PLATE 1

- FIG. 1. *Trichocera alticola* sp. nov., venation.
 2. *Trichocera glacialis* sp. nov., venation.
 3. *Trichocera abieticola* sp. nov., venation.
 4. *Ctenacroscelis nimbus* sp. nov., venation.
 5. *Tipula* (*Sinotipula*) *hutchinsonæ* sp. nov., venation.
 6. *Tipula* (*Acutipula*) *irrequieta* sp. nov., venation.
 7. *Tipula* (*Oreomyza*) *baltistanica* sp. nov., venation.
 8. *Tipula* (*Oreomyza*) *venerabilis* sp. nov., venation.
 9. *Tipula* (*Oreomyza*) *icarus* sp. nov., venation.
 10. *Tipula* (*Lunatipula*) *hypoalvata* sp. nov., venation.
 11. *Tipula xanthocera* sp. nov., venation.
 12. *Nephrotoma inconsequens* sp. nov., venation.
 13. *Nephrotoma parascutellata* sp. nov., venation.
 14. *Nephrotoma meraca* sp. nov., venation.
 15. *Nephrotoma trilobulata* sp. nov., venation.
 16. *Nephrotoma irrevocata* sp. nov., venation.
 17. *Limonia* (*Limonia*) *protrusa* sp. nov., venation.
 18. *Limonia* (*Dicranomyia*) *tricuspidata* sp. nov., venation.
 19. *Antocha* (*Antocha*) *picturata* sp. nov., venation.
 20. *Orimarga* (*Orimarga*) *basalis* sp. nov., venation.
 21. *Pseudolimnophila apicinigra* sp. nov., venation.
 22. *Hexatoma* (*Eriocera*) *luxuriosa* sp. nov., venation.
 23. *Erioptera* (*Erioptera*) *pallidclavata* sp. nov., venation.
 24. *Ormosia seclusa* sp. nov., venation.

PLATE 2

- FIG. 25. *Trichocera alticola* sp. nov., ovipositor, cercus, lateral.
 26. *Trichocera glacialis* sp. nov., male hypopygium.
 27. *Trichocera abieticola* sp. nov., male hypopygium.
 28. *Ctenacroscelis nimbus* sp. nov., male hypopygium, details.
 29. *Tipula* (*Sinotipula*) *hutchinsonæ* sp. nov., male hypopygium.
 30. *Tipula* (*Sinotipula*) *hutchinsonæ* sp. nov., male hypopygium, details.
 31. *Tipula* (*Acutipula*) *irrequieta* sp. nov., male hypopygium.
 32. *Tipula* (*Oreomyza*) *baltistanica* sp. nov., male hypopygium.
 33. *Tipula* (*Oreomyza*) *baltistanica* sp. nov., male hypopygium, styli.

PLATE 3

- FIG. 34. *Tipula* (*Oreomyza*) *venerabilis* sp. nov., male hypopygium, details.
 35. *Tipula* (*Oreomyza*) *icarus* sp. nov., male hypopygium.

- FIG. 36. *Tipula* (*Oreomyza*) *icarus* sp. nov., male hypopygium, details.
37. *Tipula* (*Lunatipula*) *submarmoratipennis* sp. nov., male hypopygium, details.
38. *Tipula* (*Lunatipula*) *submarmoratipennis* sp. nov., male hypopygium, details.
39. *Tipula* (*Lunatipula*) *hypoalvata* sp. nov., male hypopygium.
40. *Tipula* (*Lunatipula*) *hypoalvata* sp. nov., male hypopygium, details.
41. *Tipula xanthocera* sp. nov., male hypopygium, details.
42. *Tipula xanthocera* sp. nov., male hypopygium, details.

PLATE 4

- FIG. 43. *Nephrotoma inconsequens* sp. nov., male hypopygium, details.
44. *Nephrotoma parascutellata* sp. nov., male hypopygium, details.
45. *Nephrotoma meraca* sp. nov., male hypopygium, details.
46. *Nephrotoma trilobulata* sp. nov., male hypopygium, details.
47. *Nephrotoma irrevocata* sp. nov., male hypopygium, details.
48. *Limonia* (*Dicranomyia*) *tricuspidata* sp. nov., male hypopygium.
49. *Erioptera* (*Erioptera*) *pallidclavata* sp. nov., male hypopygium.
50. *Ormosia seclusa* sp. nov., male hypopygium.

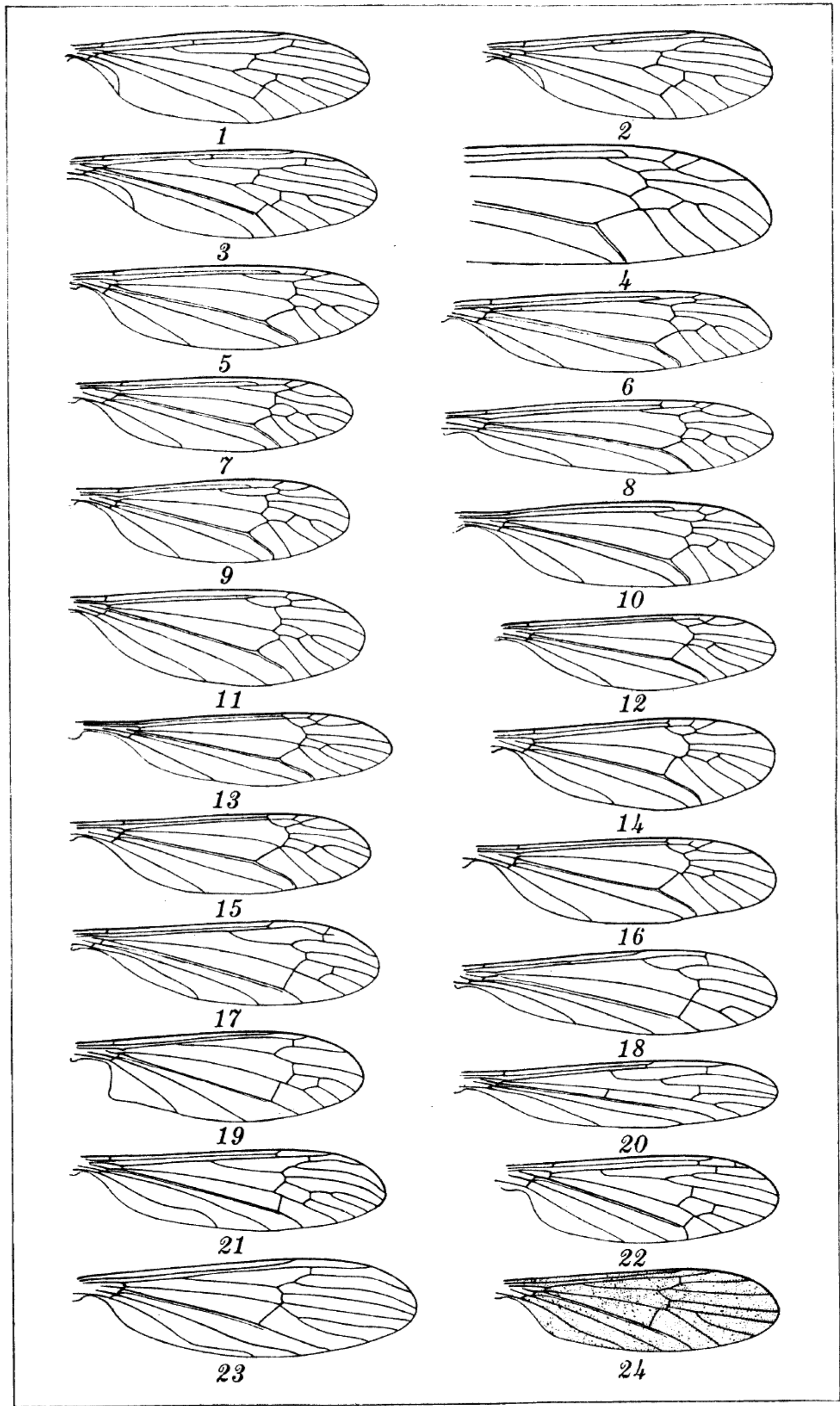


PLATE 1.



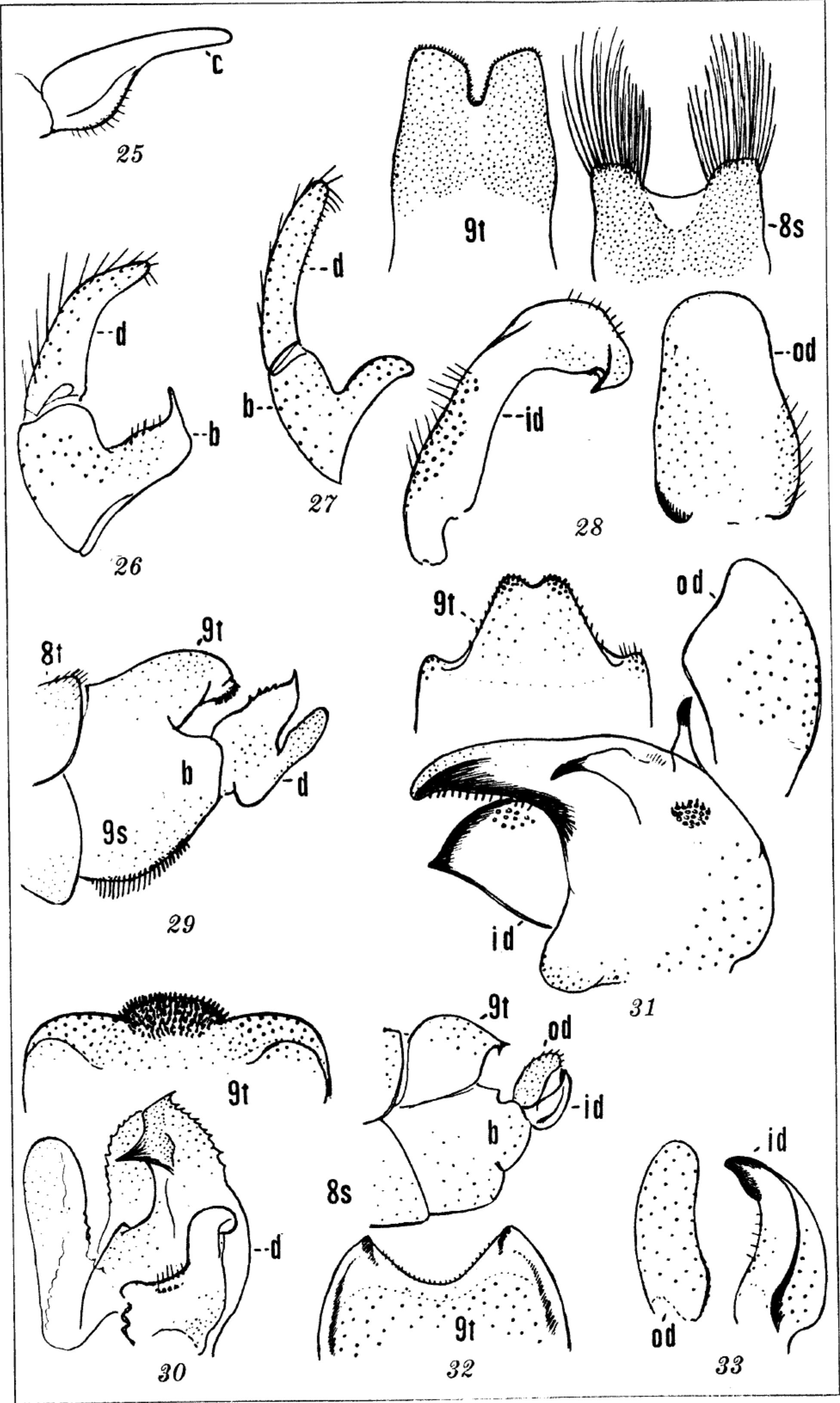


PLATE 2.

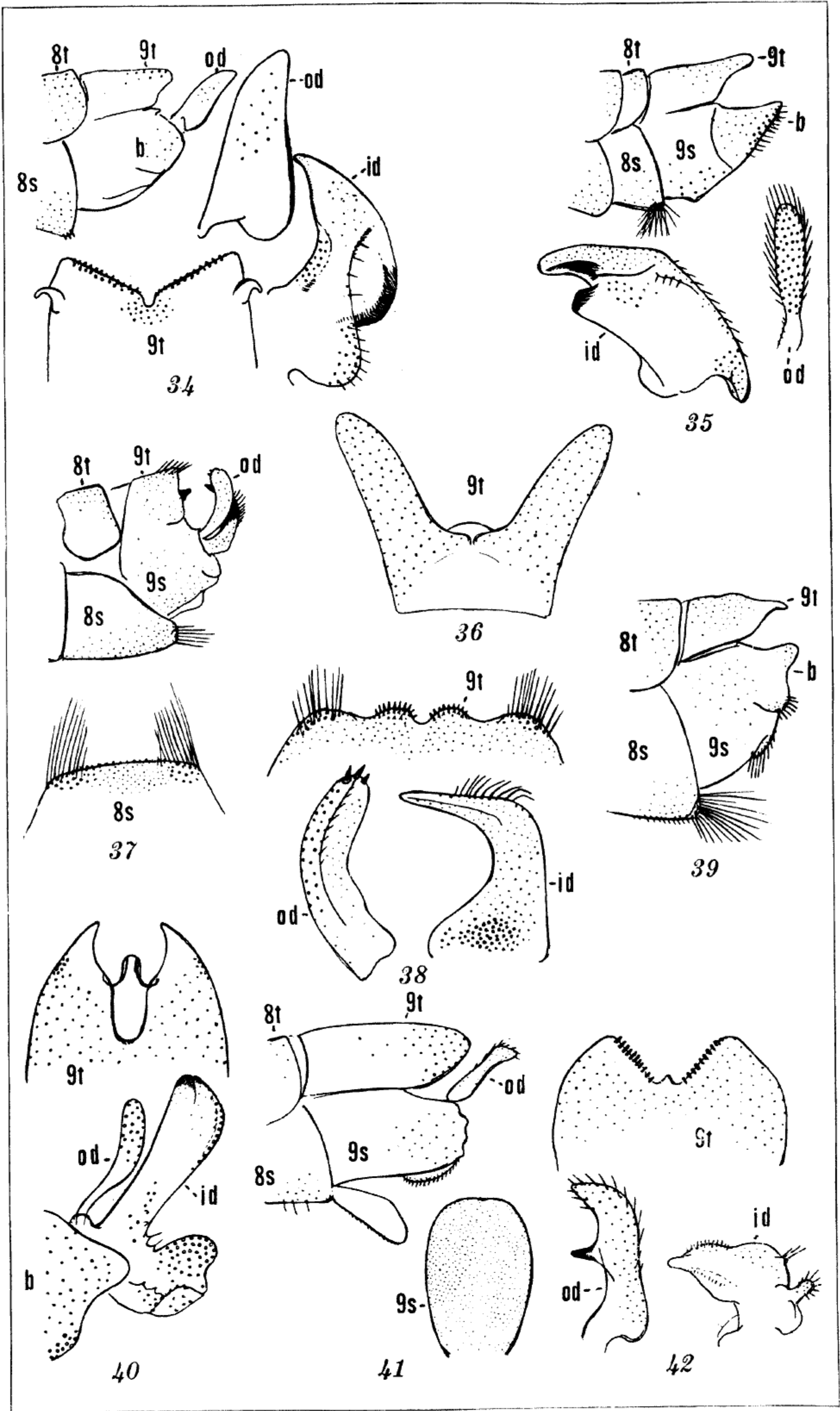


PLATE 3.

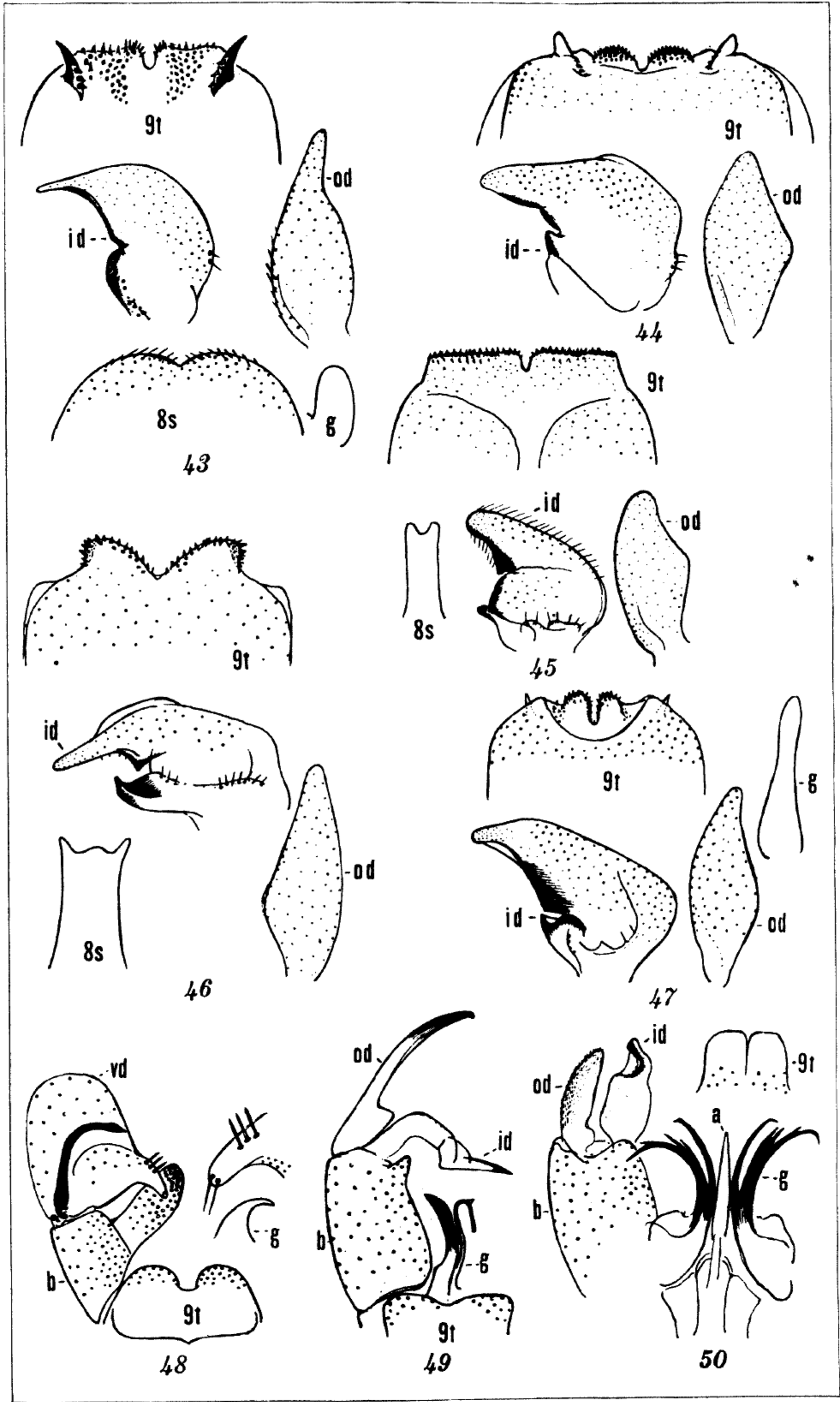


PLATE 4.