

NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN
ASIA (DIPTERA), XXI¹

By CHARLES P. ALEXANDER

Of Amherst, Massachusetts

THREE PLATES

The crane flies discussed at this time are chiefly from Formosa, where the majority were taken by Prof. Syûti Issiki, to whom I am greatly indebted for the privilege of retaining the material. Other Formosan species described here were taken in 1932 by Prof. Teiso Esaki; the types of such specimens are preserved in the Entomological Museum, Kiushiu Imperial University. A third important source of specimens is included in a series taken in the Diamond Mountains (Kongo San, Keumkang San), of Korea, by Prof. Jiro Machida, together with fewer specimens taken by the same scientist in Formosa and Honshiu; these specimens are in my own collection, through the kindly interest of Professor Machida. Other species from Korea that are discussed here and in the succeeding part under this general title, were taken by Prof. Jujiro Masaki and his colleagues, Messrs. I. Tabashi and C. Takeya; the 1930 and earlier collections from Masaki are in my collection, with duplicate numbers in the Agricultural Experiment Station of Chosen, at Suigen; the 1931 and later collections were sent to Professor Esaki and thence to me, the types being returned to Esaki, with duplicate numbers in my collection and at Suigen. I express my continued gratitude to all of the above-mentioned entomologists for this further coöperation in making known the tipulid fauna of the Japanese Empire.

The Issiki collections made in the mountains of southern Formosa have resulted in adding three subgeneric groups of Tipulidæ to those known from Japan and Formosa; namely, *Trichotipula* Alexander, *Dolichozeza* Curtis, s. s., and *Mitopeza* Edwards, as well as two others, *Elliptera* Schiner and *Helobia* St. Fargeau, to the known fauna of Formosa. Several other Pa-

¹ Contribution from the entomological laboratory, Massachusetts State College.

læarctic groups were likewise discovered in southern Formosa, south of the Tropic of Cancer, in these cases representing the most southerly distribution in eastern Asia; such additional groups are *Diätenidia* Brullé, *Dicranoptycha* Osten Sacken, *Rhaphidolabis* Osten Sacken, and *Ormosia* Rondani.

In order to complete the record, I have included one species of *Trichocera*, of the family Trichoceridæ.

TRICHO CERIDÆ

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

Size large (wing, over 8 millimeters); general coloration dark brown, sparsely dusted with grayish yellow pollen; anterior pleurites brownish black, the posterior ones paler; femora brownish yellow, the tips narrowly dark brown; wings brownish yellow, the prearcular region pale yellow; stigma pale brown; very restricted dark clouds on r-m and m-cu; abdomen dark brown; male hypopygium with the tergite produced medially into a narrow darkened lobe, its apex truncated; dististyle elongate, with a long lobe near base and a second pale lobule at near two-thirds the length.

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

Female.—Length, about 7.5 millimeters; wing, 8.5.

Rostrum dark gray; palpi black. Antennæ with scape and pedicel light brown; basal flagellar segment dark brown, remainder of flagellum black. Head gray.

Mesonotal præscutum and scutum chiefly dark brown, sparsely dusted with grayish yellow pollen; scutellum somewhat paler, especially the posterior border which is obscure yellow; mediotergite brown. Pleura with propleura, anepisternum, sternopleurite, and ventral meron brownish black, the posterior sclerites paler brown. Halteres elongate, yellow, the slender knobs dusky. Legs with the fore coxæ brownish black, the remaining coxæ and all trochanters brownish yellow; femora obscure brownish yellow, clearer yellow basally, the tips narrowly dark brown; tibiæ brownish black, the tips narrowly darker; tarsi black. Wings (Plate 1, fig. 1) with a brownish yellow tinge, the prearcular region pale yellow; stigma pale brown; very restricted dark clouds on r-m and m-cu more evident in female; veins brown, brighter in the prearcular field. Macrotrichia of veins long and conspicuous, including series on the crossveins m and m-cu. Venation: Sc_1 ending just before R_2 ; R_{2+3+4} a little shorter than R_{2+3} ; m-cu at or just before outer end of cell 1st M_2 .

Abdomen dark brown, hypopygium more yellowish. Male hypopygium (Plate 2, fig. 25) with the tergite, 9*t*, narrowly transverse, the median area produced into a slender darkened lobe, its apex truncate. Basistyle, *b*, with mesal lobe small, basal in position. Dististyle, *d*, elongate, near base on mesal face with a slender lobe that is about two-fifths the length of entire style, its apex a little expanded and provided with abundant setulæ; main axis of style at near two-thirds the length with an oval pale lobule set with several long setæ; apical third of style a clavate structure that is fringed with abundant strong spinous setæ on outer face of distal half. Gonapophyses, *g*, conspicuous, long and slender, gently curved. Ovipositor with cerci elongate, yellowish horn color.

Habitat.—Korea.

Holotype, male, Kongo San, October 18, 1933 (*Machida*).
Allotopotype, female, October 8, 1933 (*Machida*).

This rather remarkable fly needs no comparison with any other described species of the genus. In its large size it approaches the stature of the genus *Diazosma* Bergroth but is a true *Trichocera*. The structure of the male hypopygium is unusually complicated, suggesting in some respects *T. lutea* Becher (Western Palæarctic) and *T. salmani* Alexander (Eastern Nearctic), yet is very different in all details.

TIPULIDÆ

TIPULINÆ

DICTENIDIA INÆQUIPECTINATA sp. nov. Plate 1, fig. 2.

Head brownish yellow; antennæ (male) very long, with long unequal branches, the longest fully three times as long as the segments; mesonotal præscutum with three black stripes; pleura yellow, unmarked; tips of femora blackened; posterior femora with a narrow yellow subterminal ring; posterior tibiæ chiefly dirty white, only the narrow bases and tips darkened; wings tinged with yellow, the stigma and cord restrictedly seamed with brown; wing tip undarkened and without macrotrichia in the cells; abdominal segments one to five yellow, the tergites with an interrupted black dorsal stripe, segments six to nine black.

Male.—Length, about 11 millimeters; wing, 12; antenna, about 5.5.

Frontal prolongation of head yellow, with coarse black setæ, especially on nasal region; palpi brownish yellow, the terminal

segments dark brown. Antennæ elongate, approximately one-half as long as entire body; scape pale yellow; pedicel a trifle darker; flagellar segments bicolorous, the axis and branches dark brown, the outer end of axis of individual segments pale yellow, on outer two segments uniformly darkened; basal flagellar branches elongate, the longest (about flagellar segments seven to nine) fully three times the segments; apical flagellar branches long and slender but conspicuously thinner and shorter than the basal branches of the same segment; in *formosana* both branches are subequal in length and the outer one is only a trifle slenderer than the basal one; terminal segment elongate, fully one-half longer than the penultimate. Head yellow, with a faint brown tinge, but quite immaculate.

Pronotum yellow. Mesonotal præscutum yellow, with three intensely black stripes that are very slightly covered with delicate yellow setulæ to appear like a bloom; scutal lobes similarly blackened; scutellum dark brown, the parascutella pale; mediotergite pale reddish yellow. Pleura yellow. Halteres yellow, the knobs weakly infuscated. Legs with the coxæ and trochanters yellow; fore and middle femora brownish yellow, the tips broadly and conspicuously blackened, the bases narrowly clearer yellow; posterior femora more enlarged and with a narrow, clearer yellow ring before the blackened tips and about one-half as wide as the latter; fore and middle tibiæ almost uniformly blackened; posterior tibiæ narrowly blackened at base, the amount subequal to the dark femoral tips, the apices similarly narrowly darkened, the entire intermediate portion, embracing more than five-sixth of the segment, dirty white; tarsi black. Wings (Plate 1, fig. 2) tinged with yellow, the prearcular region and cells C, Sc, and Cu_1 clearer yellow; stigma oval, brown; a slightly paler brown cloud on anterior cord and a very narrow seam on m-cu; wing tip undarkened; veins brown, more yellow in the flavous areas. No macrotrichia in apical cells of wing, as is the case in all other members of the genus. Venation: Sc_1 indicated by a weak spur; M_{3+4} a little more than one-half m; petiole of cell M_1 a little shorter than m.

Abdominal tergites one to five obscure yellow, narrowly blackened medially, the caudal borders of the intermediate segments broadly grayish white; sternites one to five similarly obscure yellow; segments six to nine, with all appendages, intense black; vestiture of hypopygium black, of remainder of abdomen, yellow.

Habitat.—Formosa.

Holotype, male, Kanshirei, altitude 1,500 feet, May 13, 1933 (*Issiki*). Paratypes, 2 males, Arisan, June 6, 1932 (*Gressitt*).

Dictenidia inæquiptinata is so different from all other described species of the genus that it scarcely requires comparison with any. The lack of macrotrichia in the wing cells and the unusually long antennæ of the male, with very long unequal branches, are the most conspicuous specific characters. *Dictenidia sauteri* Enderlein² is at most a color variety of *D. formosana* Alexander.³

DOLICHOPEZA (DOLICHOPEZA) ISSIKIELLA sp. nov. Plate 1, fig. 3.

Mesonotum dark reddish brown, variegated with more grayish brown; legs very long; posterior tibiæ and tarsi entirely snowy white; central portion of anterior tibiæ and proximal ends of basitarsi more darkened; wings strongly infumed, the large stigma even darker brown; conspicuous cream-colored areas before and beyond stigma; Rs short, its origin opposite termination of Sc₂; abdominal segments conspicuously variegated with brownish yellow, dark brown, and silvery white.

Female.—Length, about 14 millimeters; wing, 11.5.

Frontal prolongation of head brownish black; palpi black. Antennæ with scape and pedicel light yellow, flagellum brownish black; flagellar segments cylindrical, with short verticils. Head behind gray, the front more silvery; a capillary brown vitta extends from the region of the vertical tubercle almost to occiput; anterior vertex wide, approximately five times the diameter of scape.

Mesonotal præscutum with the ground color on sides dark reddish brown, the lateral stripes slightly differentiated by a sparse pruinosity; intermediate stripes more pruinose on anterior ends, behind concolorous with the lateral margins; humeral region and anterior interspaces very restrictedly light gray; scutum dark reddish brown; scutellum dark brown medially, the posterior lateral portions broadly yellow, the parascutella reddish brown; mediotergite dark brown, the lateral borders somewhat paler. Pleura variegated dark brown and testaceous, the pale color including chiefly the pteropleurite and meral region. Halteres with stem obscure whitish, the extreme base brighter, the knobs dark brown. Legs with the fore coxæ chiefly dark brown, the other coxæ darkened basally with the tips broadly pale; trochanters whitish; femora dirty brownish white, the tips

² Zool. Anzeig. 52 (1921) 225–226.

³ Ann. Ent. Soc. Am. 13 (1920) 261–262.

insensibly darkened; posterior tibiae and tarsi entirely snowy white; remaining legs detached, but one pair shows the extensive central portion of tibiae pale brown, the bases somewhat narrowly, the tips broadly snowy white; tarsi snowy white, the proximal ends of basitarsi slightly darkened; legs unusually long and slender. Wings (Plate 1, fig. 3) with the ground color very strongly infumed, the costal region and narrow apical border to opposite vein Cu_1 even more darkened; stigma large, oval, dark brown; conspicuous cream-colored oblitative areas before and beyond stigma; veins dark brown. Venation: Rs short, in oblique to subtransverse alignment with the basal section of R_{4+5} and only a little longer than this element; Sc_2 ending exactly opposite origin of Rs; R_{1+2} entirely atrophied; medial forks of moderate depth; m-cu at fork of M.

Abdominal segments conspicuously variegated with brownish yellow, dark brown, and silvery white, the narrow darker rings occupying the central and apical portions of the individual segments; lateral borders of tergites and posterior portions of intermediate sternites variegated with silvery white areas; outer tergites and genital shield chiefly blackened. Cerci elongate.

Habitat.—Formosa.

Holotype, female, Kanshirei, altitude 1,500 feet, May 13, 1933 (*Issiki*).

I take great pleasure in naming this fine species in honor of the collector of this series of Tipulidæ, my friend, Prof. Syûti Issiki. The species is of great interest in being the first true member of the subgenus *Dolichozeza* to be discovered in continental Asia or the Indo-Malayan islands. The subgeneric position of *Dolichozeza postica* Brunetti is still questionable, but from the rather remarkable venation of the medial field of the wing it does not seem to be strictly referable to the subgenus *Dolichozeza*. Similarly the three Philippine members of the *malagasya* group (*ata* Alexander, *isolata* Alexander, and *bilan* Alexander) are by no means typical members of the subgenus, though placed therein provisionally. The present fly bears a superficial resemblance to *D. (Nesozeza) albitibia* Alexander, but the subgeneric characters will readily serve to distinguish the two.

DOLICHOPEZA (MITOPEZA) TAIWANICOLA sp. nov. Plate 1, fig. 4.

General coloration of mesonotum dark brown, with four paler brown stripes; knobs of halteres at tips conspicuously yellow;

tibiæ and tarsi uniformly black; wings rather strongly tinged with brown, the stigma darker; restricted cream-colored areas before and beyond stigma and across base of cell 1st M_2 ; sparse macrotrichia in distal ends of outer radial and medial cells; Sc_2 ending opposite origin of the short Rs; R_{1+2} represented as a short spur; cell M_1 long-petiolate; cell 1st M_2 very small, lying in fork of veins M_{1+2} and M_3 ; m-cu more than one-half its length before fork of M; abdominal tergites brown, the caudal borders narrowly blackened.

Female.—Length, about 8.5 millimeters; wing, 11.2.

Frontal prolongation of head testaceous-yellow; region of nasus tufted with three or four long black setæ; palpi black. Antennæ with scape and pedicel light yellow; flagellum brownish black, the flagellar verticils approximately equal in length to the segments. Front light yellow, the vertex brown; anterior vertex approximately five times as wide as diameter of scape.

Ground color of mesonotal præscutum dark brown, with four paler brown stripes, the intermediate pair narrow, tapering behind, separated by a dark median gray line that is nearly equal in width to the stripes; posterior sclerites of notum dark brown. Pleura obscure brownish yellow, the propleura and anepisternum darker brown; dorsopleural membrane extensive, dark brown. Halteres pale yellow, the bases of knobs brownish black, the apices broadly and conspicuously light yellow. Legs with the coxæ dark brown; trochanters testaceous-brown; femora dark brown, the tips passing into black; tibiæ and tarsi black; legs of moderate length only. Wings (Plate 1, fig. 4) with a rather strong brown tinge, cells C and Sc very slightly darker; stigma oval; dark brown; restricted but conspicuous cream-colored areas before and beyond stigma and across the base of cell 1st M_2 ; wing tip as far back as vein Cu_1 narrowly darkened; Cu , 2d A, and most of the longitudinal veins beyond cord very narrowly and insensibly seamed with darker; veins brownish black. Sparse macrotrichia in outer ends of cells Sc_2+R_2 , R_3 , R_5 , M_1 , and 2d M_2 . Venation: Sc_2 ending opposite origin of the short Rs; R_1 meeting R_2 at an angle, with R_{1+2} projecting beyond this point as a short spur; cell 1st M_2 very small, a little widened outwardly; petiole of cell M_1 elongate, subequal to m-cu; m-cu more than one-half its length before fork of M, M_4 branching off some distance before base of cell 1st M_2 .

Abdominal tergites brown, the caudal borders of the segments narrowly blackened; sternites obscure yellow, the caudal borders narrowly darkened. Ovipositor with small blunt valves, as in subgenus.

Habitat.—Southern Formosa.

Holotype, female, Keinensan, altitude 5,400 feet, August 14, 1933 (*Issiki*).

Dolichopeza (Mitopeza) taiwanicola is very different from the other described members of the subgenus in the short, oblique Rs, with Sc₂ ending opposite its origin. By my key to the subgenera of *Dolichopeza*⁴ the species runs to couplet 3, including *Mitopeza*, but disagrees in the character of the short sector. By my further key to the species of *Mitopeza*,⁵ the present fly runs to the subgenotype, *nitidirostris* (Edwards), a very different insect whose wing has been figured by Edwards.⁶ The latter fly has the long Sc and Rs, together with cell 1st M₂ large and cell M₁ entirely sessile. The subgenus is new to the fauna of Formosa and the Japanese Empire.

TIPULA (TRICHOTIPULA) HAPLOTRICHA sp. nov. Plate 1, fig. 5; Plate 2, fig. 26.

General coloration black, including the entire thorax, the pleura slightly pruinose; antennæ black, moderately long (male); legs black; wings with a strong brownish yellow tinge; stigma oval, dark brown; abundant macrotrichia in cells beyond cord, with the exception of 1st M₂; M₃₊₄ shorter than r-m; m-cu elongate and very oblique in position; male hypopygium with caudal margin of tergite having a broad U-shaped notch; inner dististyle with the apical beak very long and slender; ninth sternite on either side produced into a pale fleshy lobe.

Male.—Length, about 11 millimeters; wing, 12; antenna, about 4.

Rostrum and palpi black. Antennæ black, the apex of pedicel a trifle paler; flagellar segments with basal enlargements very slightly developed, the verticils scarcely one-half the length of the segments, on the outer segments becoming even shorter; terminal segment reduced to a small berrylike structure. Head gray, clearer light gray on front and anterior vertex, the latter very wide.

⁴ Philip. Journ. Sci. 46 (1931) 270.

⁵ Tome cit. 272.

⁶ Journ. Fed. Malay St. Mus. 14 (1928) pl. 1, fig. 20.

Pronotum and mesonotum entirely coal black, polished. Pleura black, the surface sparsely pruinose; dorsopleural membrane dark brown. Halteres long, the stem obscure yellow, the knob dusky. Legs with the coxæ blackened; trochanters yellow; remainder of legs black, the femoral bases rather narrowly obscure yellow. Wings (Plate 1, fig. 5) with a strong brownish yellow tinge; stigma oval, dark brown; oblitative areas before stigma and across base of cell 1st M_2 ; veins light brown. Abundant macrotrichia in cells beyond cord, with the exception of 1st M_2 , in cells M_3 to 1st A becoming progressively fewer and more nearly restricted to vicinity of margin. Venation: R_{1+2} preserved; petiole of cell M_1 shorter than m ; M_{3+4} shorter than $r-m$; basal section of M_4 perpendicular; $m-cu$ elongate and very oblique, somewhat as in the subgenus *Schummelia*, cell M_4 thus markedly widened at base.

Abdominal tergites black, the basal sternites more brownish; hypopygium black. Male hypopygium (Plate 2, fig. 26) relatively small, the tergite completely separated from the sternite, $9s$; basistyle delimited by straight sutures, the cephalic portion fused with the sternite. Ninth tergite, $9t$, with caudal margin produced into two flattened, dark-colored lobes, glabrous, their apices obliquely truncated; notch between lobes broadly U-shaped; dorsal surface of tergite with abundant setæ, these lacking only on the narrow median area and on the posterior border. Outer dististyle, od , a small oval spatulate lobe, with numerous setæ. Inner dististyle, id , blackened, produced into a long slender black beak, with a shorter black lobe lying more basad, the two together roughly resembling an irregular pair of pincers. Ninth sternite, $9s$, behind on either side produced into a pale fleshy lobe, provided with numerous long setæ. Eighth sternite unarmed.

Habitat.—Formosa.

Holotype, male, Kanshirei, altitude 1,500 feet, May 13, 1933 (S. Issiki).

Tipula (*Trichotipula*) *haplotricha* is a true member of the subgenus, the first to be reported from Japan or Formosa. The fly requires comparison with no other Japanese species of the genus having macrotrichia in the outer cells of the wing. From other species of the subgenus, it is readily told by the polished black mesonotum and the rich brownish yellow coloration of the wings. The degree of trichiation of the wings is much less than in *T. (T.) polytrichia* Alexander (western China).

TIPULA (VESTIPLEX) NESTOR sp. nov. Plate 1, fig. 6; Plate 2, fig. 27.

Belongs to the *himalayensis* group; mesonotal præscutum dark gray, with four broad dark brown stripes; antennal scape and pedicel light yellow, flagellum black; femora yellow, before mid-length passing into brown, the tips conspicuously blackened, preceded by a clear yellow ring; wings yellowish subhyaline, with pale and darker brown areas; basal five abdominal segments chiefly yellow, with ill-defined markings, the outer segments uniformly blackened; male hypopygium with caudal margin of ninth tergite with a very broad V-shaped notch, the lateral lobes thus formed slender and pale; basistyle obtuse at tip.

Male.—Length, about 14 millimeters; wing, 18.5.

Frontal prolongation of head ochereous above, dark brown laterally beneath; nasus elongate, brownish black; palpi black. Antennæ of moderate length; scape and pedicel yellow, flagellum black throughout; verticils subequal to or a trifle longer than the segments. Head brownish yellow, with a narrow brown longitudinal stripe extending from the summit of anterior vertex to shortly before occipital band.

Mesonotal præscutum somewhat discolored, the ground color dark gray, with four broad dark brown stripes, the intermediate pair barely separated by a capillary gray vitta, their mesal edges narrowly blackish; lateral borders more ochereous; scutum dark gray, each lobe with two confluent dark brown stripes; scutellum and mediotergite dark gray, with a more or less distinct median dark vitta. Pleura with anepisternum and sternopleurite chiefly darkened and pruinose; posterior sclerites and pleurotergite much paler, more ochereous. Halteres with stem obscure brownish yellow, knobs dark brown with pale apices. Legs with the coxæ and trochanters chiefly pale; femora yellow basally, before midlength passing into brown, the tips conspicuously blackened, preceded by a clearer yellow subterminal ring; tibiæ brownish black, the tips narrowly blackened; tarsi black. Wings (Plate 1, fig. 6) with the usual pattern of the group; postarcular brown area conspicuous and clearly delimited; cream-colored areas in outer ends of anal cells restricted in size but well-defined; whitish spot before stigma entirely surrounded by brown. Venation: R_4 long and gently sinuous, cell R_3 at margin considerably more extensive than cell R_4 ; inner end of cell 1st M_2 pointed; m-cu close to fork of M_{3+4} .

Abdomen with basal five tergites yellow, with very ill-defined dusky median and sublateral stripes, on basal three or four seg-

ments unusually narrow, on the fifth segment the laterals much heavier; sixth tergite black except for a restricted obscure yellow area on either side of median line; succeeding segments and hypopygium black; basal five sternites uniformly yellow, the outer four black. Male hypopygium (Plate 2, fig. 27) with the tergite separated from sternite except on cephalic portion; basistyle well delimited by a pale suture above, the apex obtuse, not or scarcely produced. Ninth tergite, *9t*, relatively short, the caudal margin with a very broad V-shaped notch, the very slender lateral lobes paler than the remainder of sclerite, fringed with long pale setæ; on ventral surface of sclerite on either side and separated by pale membrane is a slender black chitinized point, not shown in figure. Mesal or inner face of basistyle, *b*, with a flattened ribbonlike blade, with five or six setæ near apex. Outer dististyle, *od*, a spatulate blade. Inner dististyle, *id*, narrowed at apex into a blackened beak. Eighth sternite with margin gently and convexly rounded, unarmed; pale medially at margin; a broken transverse row of pale spots or punctures near base of sclerite.

Habitat.—Formosa.

Holotype, male, Kanzangoe, Taitô-chô Kaimosu to Kanzan-anbu, August 19, 1932 (*Esaki*).

There are now several species in Formosa that appear to belong to the *himalayensis* group of *Vestiplex*, such including *arisanensis* Edwards, *bicornuta* Alexander, *biserra* Edwards, *foliacea* Alexander, *terebrata* Edwards, and probably *quadrifulva* Edwards. Several of these are still known only from the female sex. The present fly differs notably from all other species in which the male sex is known in the structure of the hypopygium. Among the other species, it agrees most nearly with *terebrata* Edwards (Formosa, in May), differing especially in the details of coloration of the head, thorax, and abdomen, and in the finer points of wing pattern. Edwards's figure of the wing of *terebrata*⁷ shows the costal and subcostal cells to be much darker than in the present species, the pale areas in anal field more extensive and diffuse, and with the basal section of vein M_3 longer than the basal section of M_{1+2} . The discovery of the male sex of *terebrata* will probably show points of difference in the hypopygium.

⁷ Ann. & Mag. Nat. Hist. IX 8 (1921) pl. 10, fig. 16.

TIPULA (VESTIPLEX) PARVAPICULATA sp. nov. Plate 1, fig. 7; Plate 2, figs. 28, 29.

Belongs to the *himalayensis* group; mesonotal præscutum olive-gray, with four narrow grayish brown stripes that are slightly margined with darker brown; antennal flagellum weakly bicolorous; apices of knobs of halteres conspicuously whitish; femora yellowish brown, the tips blackened, preceded by a clearer yellow ring; wings light brown, variegated with darker brown and cream-colored areas as in the group; cell R_3 at margin a little more extensive than cell R_4 ; basal abdominal tergites reddish yellow, trivittate with brownish black; outer four segments uniformly brownish black; male hypopygium with caudal margin of tergite broadly emarginate; basistyle obtuse at tip but produced into a small acute black spine; a long slender arm from mesal face of basistyle is bifid at tip into two acute spines.

Male.—Length, about 15 millimeters; wing, 18.5.

Frontal prolongation of head ochreous above, darker laterally beneath. Antennæ of moderate length only; basal three segments pale; succeeding segments weakly bicolorous, the basal enlargements black, the outer portions brown, only the outer segments becoming uniformly darkened. Head olive-gray, with a conspicuous brown line on posterior vertex, this sending a capillary vitta onto summit of vertical tubercle, the line being further produced behind to the occiput.

Mesonotal præscutum olive-gray, with four narrow grayish brown stripes that are slightly margined with dark brown, the ground color most distinct on cephalic ends of the intermediate stripes; scutal lobes similar, each with two clearly separated dark brown areas; posterior sclerites of mesonotum gray, with a conspicuous median brown line. Pleura chiefly olive-gray, variegated by darker areas, especially on ventral anepisternum, ventral sternopleurite and on posterior sclerites, the pleurotergite with a ridge of the ground color. Halteres dusky, the base of stem restrictedly pale; base of knob dark brown, the apex of same conspicuously pale. Legs with coxæ olive-gray; trochanters yellow; femora chiefly light yellowish brown, the tips blackened, preceded by a clearer yellow ring; tibiæ dark brown, the tips narrowly blackened; tarsi black. Wings (Plate 1, fig. 7) light brown, variegated by darker brown and cream-colored areas, as in the group; postarcular darkening in cells R and M extensive and clearly defined; cream-colored area immediately before origin of R_s extensive; pale spot before stigma barely confluent with the pale color in cell R_1 ; outer cream-colored area in cell

M much restricted in area; pale areas in outer ends of anal cells very small and ill-defined; veins brown, paler in the flavous costal region. Venation: Cell R_3 at margin a little more extensive than cell R_4 .

Abdomen with the basal four tergites chiefly reddish yellow, trilineate with brownish black, the lateral borders beyond the base broadly grayish; tergite five more darkened apically; outer four segments uniformly brownish black. Male hypopygium (Plate 2, fig. 28) with the tergite, $9t$, fused basally with the sternite; basistyle, b , cut off from sternite by broad and deep dorsal, and narrow, less distinct, ventral sutures, the narrow central portion being fused, without sutures. Ninth tergite, $9t$, with the dorsal surface pale, with a more-blackened central band that is narrowly interrupted at the midline; caudal margin of tergite broadly emarginate, the lateral lobes wide but thin; a small median denticle; from ventral surface of tergite on either side a black flattened plate, its margin microscopically serrulate. Basistyle (Plate 2, fig. 29, b) with the broadly obtuse apex further produced into a tiny black apiculate point, the ventromesal portions further produced mesad into slender arms that are blackened and curved into weak spines at tips, not widely separated at the midline of body; a conspicuous arm of basistyle, b , is produced caudad as a slender rod, at apex divided into two acute spines, one subapical and smaller than the axial spine; lower margin of this sclerotized arm with a sparse fringe of long erect yellow setæ distributed the entire length of the structure. Dististyles, id , od , as shown. Ninth sternite with a median membranous U-shaped incision. Eighth sternite unarmed but with an interrupted transverse row of pale punctures on basal half.

Habitat.—Northern Formosa.

Holotype, male, Taiheizan, Taihoku-shû, October 24, 1932 (*Keishô Satô*).

Tipula (Vestiplex) parvapiculata is still another of the now numerous species of the *himalayensis* group in Formosa. All such species are most readily and safely classified by the details of structure of the male hypopygium. On such a character, the present fly is told by the small apiculate black point at apex of the basistyle. Compared with the Formosan species of the group that were described by Edwards, the fly agrees most nearly with *T. (V.) biserra* Edwards in the bicolorous antennal flagellum, differing most evidently in the pattern of the legs and wings

and in the venation, especially of the outer radial field, where vein R_3 is not deflected cephalad at its outer end, thus narrowing cell R_2 . It cannot be stated whether these now rather numerous species of the group are definitely seasonal in distribution, as is the case with most holarctic species of the genus. The present fly is on the wing in autumn, whereas all of Edwards's species (*arisanensis*, *biserra*, *quadrifulva*, and *terebrata*) are adult in April and May. It is questionable, further, whether *quadrifulva* belongs to the subgenus *Acutipula* or to *Vestiplex*; the wing pattern is much as in members of the *himalayensis* group of *Vestiplex*, but the brief description of the ninth tergite of the male hypopygium is very suggestive of the condition found in *Acutipula*.

TIPULA (ACUTIPULA) OBTUSILOBA sp. nov. Plate 2, fig. 30.

Belongs to the *munda* group; allied to *oncerodes*, differing chiefly in the structure of the male hypopygium, especially of the inner dististyle, the outer lobe of which is obtusely rounded and unarmed except for a small acute spine on the outer margin at near midlength.

Male.—Length, about 19 to 21 millimeters; wing, 24 to 26.

Frontal prolongation of head obscure yellow, the elongate nasus brown; palpi dark brown. Antennæ short, not exceeding the head in length; scape and pedicel yellow; flagellum bicolorous, the bases of the segments weakly darkened, the apices yellow, the outer segments more uniformly darkened; verticils much longer than the segments. Head dark brown, probably pruinose in fresh specimens, discolored in types.

Mesonotum almost uniformly brown, without distinct markings; mediotergite darker, with conspicuous yellow setæ. Pleura more yellowish, paler than the notum. Halteres slender, obscure yellow, the knobs darker. Legs yellowish brown to brown, elongate. Wings grayish subhyaline, cells C and Sc, with the stigma more yellowish brown; veins slightly darker brown. Venation: Second section of M_{1+2} rather strongly arcuated; petiole of cell M_1 a little longer than m.

Abdominal tergites rather light brown, the outer segments somewhat darker; sternites more brownish yellow. Male hypopygium with the median lobe of tergite as viewed from above (Plate 2, fig. 30, 9t) slender, with conspicuous black spinous points at tip and for a short distance basad. Outer dististyle flattened, entirely pale. Inner dististyle, *id*, with the apical beak pale, only the margin blackened, relatively stout; outer lobe

with apex obtusely rounded, unarmed except for a single acute spinous point on outer or posterior margin at near midlength of lobe.

Habitat.—Northern Formosa.

Holotype, male, Taiheizan, Taihoku-shû, Kamiyodani, July 25, 1932 (*Esaki*). Paratopotype, male.

Tipula (Acutipula) obtusiloba is most nearly allied to *T. (A.) oncerodes* Alexander and *T. (A.) platycantha* Alexander, of western China, differing in the structure of the hypopygium, more especially of the inner dististyle. The beaklike portion of the style is much stouter than in *platycantha*, while the armature of the outer lobe is quite different in all three species. The species of *Acutipula* from Japan proper, with the wings unmarked, including *T. (A.) bipenicillata* Alexander and *T. (A.) tokionis* Alexander, have the hypopygium of very different structure.

TIPULA (OREOMYZA) KOREANA sp. nov. Plate 1, fig. 8; Plate 2, fig. 31.

Belongs to the *marmorata (fragilis)* group; scape and pedicel yellow, flagellum black; femora yellow, the tips conspicuously brownish black; wings gray, variegated by dark brown and cream-colored areas as in the group; a dark cloud at outer end of cell R_2 and adjoining parts of R_3 ; cells Sc and Cu_1 uniformly darkened; male hypopygium with the tergite produced into two divergent points; inner dististyle black, gradually narrowed into a long slender apical point; eighth sternite projecting, narrowed outwardly, the slender obtuse apex densely clothed with abundant short yellow setæ.

Male.—Length, about 13 millimeters; wing, 15.

Female.—Length, about 17 to 20 millimeters; wing, 15.5 to 18.

Frontal prolongation of head gray; nasus elongate; palpi dark brown. Antennæ with scape and pedicel yellow; flagellum black; flagellar segments (male) rather strongly incised for a member of this group, the longest verticils subequal to the segments. Head gray.

Pronotum gray. Mesonotum light gray, the præscutum with four bright brown stripes, the intermediate pair not attaining the suture behind and each split at anterior ends, the outer margin extended a slight distance cephalad beyond the internal border; scutal lobes variegated with brown. Pleura gray, the dorso-pleural membrane buffy brown. Halteres yellow, the knobs dark

brown. Legs with the coxæ gray; trochanters yellow; femora yellow, the tips conspicuously brownish black; tibiæ obscure yellow, the tips brownish black; tarsi black, the proximal ends of basitarsi more brightened. Wings (Plate 1, fig. 8) with the ground color gray, variegated by dark brown and cream-colored areas; stigma and cells Sc and Cu₁ uniformly brown; prearcular region light yellow, cell C brownish yellow; restricted brown seams along anterior cord, at origin of Rs, outer end of cell R₂, and adjoining central portion of cell R₃; wing margin narrowly seamed with brown; paler brown clouds in cells M, Cu, and anals as in group; veins brown. Crossveins m and m-cu with complete series of macrotrichia. Venation: Sc₂ ending opposite midlength of the relatively long Rs; m-cu not far beyond inner end of cell 1st M₂, M₃₊₄ being short to very short; m-cu on M₄ shortly beyond base; veins R₃, second section of M₁₊₂, M₁ and M₂ all arcuated, as common in group.

Abdomen with basal tergite brownish gray; segments two and three, together with base of four, light yellow, the outer segments more uniformly brownish gray. In female, the sub-basal tergites are more or less distinctly bordered laterally by darker. Male hypopygium (Plate 2, fig. 31) with the tergite, 9t, fused with sternite except for a distal suture; basistyle chiefly fused with sternite. Ninth tergite, 9t, with the caudal margin produced into two blackened, decurved, and slightly divergent points; apical margin on ventral surface slightly more tumid and set with small blackened points. Outer dististyle, od, flattened, the dorsal margin at base heavily blackened but not produced into a tooth as in several species of the group. Inner dististyle, id, almost uniformly blackened, narrowed at apex into a long slender black spine, with a small fleshy lobule on each side at base; face of style on posterior portion near base produced into a long acute black spine. Basistyle not produced but its inner or ventral margin heavily blackened and produced into a small black spine, shown in figure. Eighth sternite, 8s, long, produced into a shovellike lobe, narrowed outwardly, the tip fringed with abundant short yellow setæ; sclerite brown, with a conspicuous yellow median midline.

Habitat.—Korea.

Holotype, male, Kongo San, October 8, 1933 (*Machida*). Allotopotype, female, October 17, 1933. Paratopotypes, 3 females, October 8 to 18, 1933 (*Machida*).

I consider the present fly to be somewhat more nearly allied to *Tipula* (*Oreomyza*) *kiushiuensis* Alexander, of southern Japan, than to the various Siberian species (*cupida* Alexander, *docilis* Alexander, *fidelis* Alexander). However, it is very distinct from all in hypopygial characters, notably of the inner dististyle and eighth sternite.

TIPULA (OREOMYZA) OBNATA sp. nov. Plate 1, fig. 9; Plate 2, fig. 32.

General coloration gray, with a continuous brown median vitta extending from vertex of head to base of abdomen; præscutal interspaces with numerous dark punctures; legs black; wings whitish, the costal region more yellowish; cell Sc before arculus darkened; several of the longitudinal veins narrowly but conspicuously seamed with black; R_{1+2} chiefly atrophied; basal abdominal tergites yellow, narrowly trivittate with brown; outer segments more uniformly brownish black; male hypopygium with the median region of tergite with a broad median notch; apex of eighth sternite with abundant setæ.

Male.—Length, about 9.5 millimeters; wing, 11.

Female.—Length, 12 to 13 millimeters; wing, 12 to 13.5.

Frontal prolongation of head light gray above, dark below and on sides; palpi black. Antennæ, if bent backward, extending to beyond the wing root; scape, pedicel, and basal segment of flagellum yellow; succeeding flagellar segments weakly bicolorous, the basal enlargements black, the remainder dark brown; verticils shorter than the segments. Head light gray, with a very delicate capillary dark median vitta.

Mesonotum gray, with a continuous median brown vitta extending from cephalic portion of præscutum to base of abdomen, scarcely or but slightly interrupted at the various sutures; præscutal stripes four, only insensibly darker gray than the ground; interspaces with conspicuous brown setigerous punctures; scutal lobes conspicuously variegated with dark brown. Pleura light gray, the dorsopleural region pale yellow. Halteres with stem pale, the knobs darkened. Legs with the coxæ yellow, sparsely pruinose; trochanters yellow; remainder of legs black, femora scarcely brightened basally; in allotype, the posterior femora show very vague indications of a subterminal obscure yellow ring. Wings (Plate 1, fig. 9) with the ground color whitish, the posterior prearcular region and cell Sc clear light yellow, cell C a trifle more brownish yellow; anterior prearcular region, especially in cell Sc, conspicuously dark brown; a re-

stricted dark brown pattern, including the stigma, cord, vein Cu, including cell Cu₁, a slight postarcular darkening and narrow dark seams on veins R₄₊₅, outer half of M, all branches of M, and all of 2d A except the very narrow basal portion; a much paler brown clouding in outer radial cells; vein 1st A not seamed with brown; veins dark, more flavous in the yellow areas described. Venation: R₁₊₂ persisting only as a short basal spur; cell M₁ large; cell 1st M₂ relatively small.

Abdomen with basal four or five segments yellow, the tergites narrowly trivittate with brown; midline of sternum similarly darkened; outer segments more uniformly brownish black. Male hypopygium (Plate 2, fig. 32) with the tergite, 9t, separate from the sternite, 9s; basistyle chiefly delimited from sternite. Ninth tergite, 9t, with a broad median notch, the dorsal face with a median incised line. Outer dististyle, od, pale, dilated outwardly, the apex obliquely truncated. Inner dististyle, id, with a row of about fifteen to eighteen slender setæ on outer margin but without a blackened basal spine, as in *edwardsella*. Eighth sternite, 8s, large and sheathing, the slope of its obtuse outer end with abundant setæ; in membrane between the eighth and ninth sternites, on midline of body, a further brush of long setæ. Ædeagus relatively short and stout.

Habitat.—Formosa.

Holotype, male, Hassenzan, Taichu-shû, Reimei, July 13, 1932 (*Esaki*). Allotopotype, female, Reimei-Piawaikei-Baibarasan, July 13, 1932 (*Esaki*). Paratype, female, Taiheizan, Taihoku-shû, Togano, July 21, 1932 (*Esaki*).

The nearest ally of the present fly seems undoubtedly to be *Tipula (Oreomyza) edwardsella* Alexander (*flavicosta* Edwards, preoccupied), likewise from the high mountains of Formosa, on the wing in May. This fly lacks the median dark vitta on the posterior sclerites of the mesonotum, as also the dark punctures on the præscutal interspaces. The details of the wing pattern, venation, halteres, coloration of abdomen, and structure of the male hypopygium, are likewise distinct. The larger *Tipula pluriguttata* Alexander similarly has the atrophied vein R₁₊₂ and conspicuous setigerous punctures on the præscutal interspaces, but is entirely different in coloration of the body and wings; its male is still unknown to me.

LIMONIINÆ

LIMONIINI

LIMONIA (LIMONIA) MELAS sp nov. Plate 1, fig. 10; Plate 3, fig. 33.

Belongs to the *globithorax* group; general coloration of entire body dark brown or brownish black; antennæ black throughout, basal flagellar segments globular; halteres and legs black; wings very strongly suffused with blackish; male hypopygium with the tergite deeply notched medially, each lobe conspicuously produced; rostral spines at extreme base of outer face of dististyle, the apex of the latter gently emarginate and set with powerful setæ; a small black point some distance before apical spine of gonapophysis.

Male.—Length, about 4.5 millimeters; wing, 5.5.

Rostrum and palpi black. Antennæ black throughout; basal flagellar segments globular, the outer ones passing into short-oval; terminal segment slenderer but scarcely longer than the penultimate. Head brownish black; anterior vertex a little brightened, a trifle wider than the diameter of the scape.

Pronotum and mesonotum dull dark brown or brownish black; setæ on anterior interspaces long and conspicuous; scutellum a little paler. Mesonotum high and gibbous, as in the group. Pleura dark brown. Halteres black throughout. Legs with the coxæ dark brown; trochanters testaceous; remainder of legs black. Wings (Plate 1, fig. 10) very strongly suffused with blackish; cells C and Sc a trifle darker, prearcular cells a little paler; veins black. Venation: Sc₁ ending beyond midlength of Rs, Sc₂ at its tip; free tip of Sc₂ pale, more than its own length before level of R₂, the intervening section of vein R₁ with about five trichia; m-cu at fork of M.

Abdomen, including hypopygium, black. Male hypopygium (Plate 3, fig. 33) with the tergite, 9*t*, deeply notched medially, each lobe conspicuously produced. Dististyle, *d*, with the rostral spines at extreme base on outer margin, as in the group; style flattened, very gently widened outwardly, the apex very slightly emarginate and fringed with abundant strong powerful setæ; other more delicate setæ on outer and inner margins of style but none on disk. Gonapophyses, *g*, with mesal-apical lobe produced into a long curved black spine, with a further small blackened point as base of the narrowed portion. Entire surface of ædeagus, *a*, covered with abundant delicate setulæ.

Habitat.—Southern Formosa.

Holotype, male, Keinensan, altitude 5,400 feet, August 14, 1933 (*Issiki*).

The nearest allies of the present fly are *Limonia* (*Limonia*) *globithorax* (Osten Sacken) of northeastern North America, and its very close vicarious representative, *L.* (*L.*) *globulithorax* (Alexander), of northern Japan. The present species is readily told from these by differences in the structure of the male hypopygium, especially of the tergite, dististyles, and gonapophyses.

It may be doubted that the two pale spines placed at the extreme base of the outer face of the dististyle are really homologous with the rostral spines found elsewhere throughout the genus, and it seems advisable at this time to point out a few of the intermediate stages that have culminated in this peculiar condition. Normally the spines are one, or more often two, in number and are placed on a lobe or produced area on the mesal face of the dististyle, commonly called the rostrum or rostral prolongation; when two dististyles are present, this rostral production is on the ventral style. The vast majority of all species in the genus (and including representatives of every one of the known subgenera of *Limonia*; namely, *Alexandriaria*, *Dapanoptera*, *Dicranomyia*, *Discobola*, *Doaneomyia*, *Euglochina*, *Geranomyia*, *Goniodineura*, *Idioglochina*, *Laosa*, *Libnotes*, *Limonia*, *Neolimnobia*, *Peripheroptera*, *Pseudoglochina*, *Rhipidia*, *Thrypticomyyia*, *Zalusa*, and *Zelandoglochina*⁸) have one or both of these spines present and placed on the rostral prolongation itself, usually at or beyond midlength, more rarely at or close to base of the prolongation. In a few cases (attaining an extreme in certain species of *Dicranomyia* and *Rhipidia*) the rostral spines may reach the number of a dozen or more, all placed on the prolongation. From this start we then find species where both spines are definitely removed from the prolongation onto the face of the style. Further progressive modifications move the spines caudad and thence cephalad around the periphery of the style, they being at the exact summit in *L.* (*Discobola*) *margarita* Alexander; beyond the summit and far distad on outer face of style in *L.* (*Limonia*) *flavoterminalis* Alexander; halfway between this point and the base on outer face in *L.* (*Limonia*) *tabashii* sp. nov. (Plate 3, fig. 34), and close to the extreme base in the present species (Plate 3, fig. 33), *L.* (*Limonia*) *globithorax* Osten Sacken, and several others of this general

⁸ Vide Alexander, Philip. Journ. Sci. 40 (1929) 241-244.

group. Thus in the Japanese fauna alone we have almost every possible position of the rostral spines on the periphery of the ventral dististyle. In other faunal regions, other curious deviations from the normal position may be found, as in *Limonia* (*Limonia*) *firestonei* Alexander and *L. (L.) metatarsalba* Alexander, of the Ethiopian Region, where the spines lie on the disk of the style. I have been somewhat detailed and specific in the above statement as I desire to show that even in as plastic a character as the position of these spines all subgeneric groups show this fundamental character and show close interrelationships. Certain students of the Tipulidæ still maintain *Limonia* as being distinct from *Dicranomyia*, *Geranomyia*, and other familiar groups in this complex, believing that the hypopygium of *Limonia* has a construction very different from that of the other mentioned groups. That this belief has no basis in fact becomes readily apparent when one studies a considerable range of types throughout the genus.

LIMONIA (LIMONIA) TABASHII sp. nov. Plate 1, fig. 11; Plate 3, fig. 34.

Belongs to the *globithorax* group; antennæ black throughout; mesonotum only slightly gibbous, fulvous to orange, the pleura pale yellow; legs and halteres chiefly darkened; wings uniformly tinged with brown; stigma lacking; Sc relatively short, ending just beyond one-third the length of Rs; abdominal tergites dark brown, the basal sternites and hypopygium yellow; male hypopygium with the dististyle narrowed to the rostral portion, at apex with a blackened spine; rostral spines lying on outer face of style at about one-third the distance from base.

Male.—Length, about 4 to 4.2 millimeters; wing, 4.8 to 5.

Rostrum and palpi reduced in size, dark. Antennæ black throughout; flagellar segments subglobular, the outer ones slightly more elongate; terminal segment strongly constricted and narrowed beyond midlength; longest verticils unilaterally arranged and exceeding the segments in length. Head light fulvous.

Mesonotum only slightly gibbous, light fulvous to orange, the scutellum a little more obscure. Pleura pale yellow. Halteres brown, the stem obscure yellow. Legs with the coxæ and trochanters pale yellow; femora obscure yellow, the tips weakly darkened; tibiæ dark brown; tarsi black. Wings (Plate 1, fig. 11) uniformly tinged with brown; stigma lacking; veins darker brown. Venation: Sc relatively short, Sc₁ ending at just beyond one-third the length of Rs, Sc₂ at its tip; free tip of Sc₂

lying opposite or just before level of R_2 ; m-cu at fork of M, subequal to distal section of Cu_1 .

Abdominal tergites dark brown; basal sternites yellow, the outer ones somewhat darker; hypopygium yellow. Male hypopygium (Plate 3, fig. 34) with the tergite, $9t$, large, narrowed outwardly, the caudal margin with a U-shaped notch, the obtuse lateral lobes with long conspicuous setæ. Basistyle, b , relatively slender, the ventromesal lobe at outer end. Dististyle, d , fleshy, much smaller than the basistyle, oval, the rostral portion more narrowed and terminating in an acute blackened spine; rostral spines two, migrated to the outer face of style at about one-third the distance from base. Gonapophyses, g , with mesal-apical lobe long and slender, nearly straight. \mathcal{A} edeagus, a , broad, the central portion profoundly bifid.

Habitat.—Korea.

Holotype, male, Suigen, September 16, 1930 (*Tabashi*); No. 28. Paratopotype, male.

Limonia (Limonia) tabashii is named in honor of the collector of this interesting material. The species needs no comparison with other members of the group, being readily told by the fulvous mesonotum and structure of the male hypopygium, especially of the dististyle and the position thereon of the rostral spines.

LIMONIA (LIBNOTES) BASISTRIGATA sp. nov. Plate 1, fig. 12.

Coloration of entire thorax and abdomen pale yellow; antennal flagellum yellow, the narrowed outer half of the terminal segment black; knobs of halteres brownish black; legs yellow, the tips of femora and tibiæ broadly black; vestiture of femora consisting of very small spinous setæ; wings yellow, sparsely variegated with dark brown; a conspicuous black streak between wing base and crossvein h , occupying cells C and Sc; setæ of costal fringe short; ovipositor with cerci bifid at tips.

Male.—Length, about 13 to 15 millimeters; wing, 19 to 21.

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

Rostrum dark brown; palpi black. Antennæ with scape brown; pedicel and antennæ light yellow, the apical half of last segment suddenly blackened; flagellar segments subglobular to short-oval, with verticils that are shorter (on basal segments) to a little longer than the segments; terminal segment longer and suddenly narrowed on distal end. Head gray, the posterior vertex chiefly suffused with rich brown; anterior vertex narrow, about one-third the diameter of scape.

Pronotum, mesonotum, and pleura entirely pale yellow, unmarked. Halteres yellow, the knobs brownish black. Legs with the coxæ and trochanters light yellow; femora yellow, the tips broadly and conspicuously blackened; tibiæ yellow, the tips a little more narrowly blackened; basitarsus and second segment brownish yellow, the tips narrowly blackened; outer three tarsal segments more uniformly blackened; vestiture of legs consisting of abundant but very small spinous setæ, on tarsi somewhat longer and more appressed. Wings (Plate 1, fig. 12) strongly tinged with pale yellow, the costal border to apex clearer bright yellow; a conspicuous black streak extends from wing base to *h* in cells C and Sc; restricted dark brown seams at origin of Rs, along cord, Sc₂, free tip of Sc₂, and R₂; outer end of cell 1st M₂; a continuous dark seam on outer half of basal section of Cu₁ and the entire distal section of the same vein; vein R₄₊₅ more narrowly seamed with brown, its base and apex clear; outer half of vein 2d A seamed with brown; extreme axillary region darkened; veins yellow, brown in the infuscated areas. Setæ of costal fringe abundant but very short; trichia of veins small and delicate. Venation: Free tip of Sc₂ and R₂ in approximate transverse alignment; R₃ and R₄ parallel on outer ends and very strongly decurved; *m* about twice the basal section of M₃; *m-cu* a little more than its own length beyond the fork of M; anal veins convergent basally.

Abdomen, including hypopygium, entirely light yellow. Male hypopygium of the usual structure of the subgenus; lobe of ventral dististyle with four or five long powerful setæ; spines of rostral prolongation elongate, nearly as long as the prolongation itself, arising close together from a short common tubercle, one spine slightly lower than the other. Ovipositor with cerci bifid at tips.

Habitat.—Korea.

Holotype, male, Kongo San, October 16, 1933 (*Machida*). Allotopotype, female, October 17, 1933. Paratopotype, male, with the allotype.

The nearest allied species is *Limonia (Libnotes) nohirai* (Alexander), of Korea and northern Japan, which differs conspicuously in the dark brownish gray coloration of the mesonotum and pleura, the differently patterned wings, such as the lack of the black basal streak, the differently patterned abdomen, and other characters. The two species are evidently allied, agreeing in the

general pattern of the wings and legs, the reduced vestiture of the costal vein and the legs, and the bifid tips of the cerci.

LIMONIA (LIBNOTES) GRISEOLA sp. nov. Plate 1, fig. 13.

General coloration dark brownish gray; antennæ black throughout; mesonotal præscutum with indications of three brown stripes; knobs of halteres weakly darkened; femora yellow, the tips narrowly blackened; wings tinged with yellow, sparsely patterned with brown along cord and outer end of cell 1st M_2 ; wing tip narrowly darkened; basal section of R_{4+5} long, fully one-half Rs; free tip of Sc_2 and R_2 in transverse alignment; m-cu at midlength of cell 1st M_2 ; abdomen brownish black; cerci with simple tips.

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

Rostrum and palpi black. Antennæ black throughout; flagellar segments oval, with verticils that are subequal in length to the segments; terminal segment fully twice as long as the penultimate, strongly narrowed outwardly. Head dark gray, the linear anterior vertex more silvery gray.

Mesonotal præscutum dark brownish gray, with three very indistinct dark brown stripes that are sparsely dusted with pollen; posterior sclerites of notum gray, the scutal lobes darker in centers. Pleura dark brown, dusted with gray. Halteres pale yellow, the knobs weakly infuscated. Legs with the coxæ darkened, their apices paler; trochanters yellow; femora yellow, the tips rather narrowly but conspicuously blackened; tibiæ brownish yellow, the tips narrowly blackened; basitarsi obscure yellow; remainder of legs broken. Wings (Plate 1, fig. 13) tinged with yellow, the prearcular and costal regions clearer yellow; wing tip in outer radial field weakly darkened; stigma narrow, appearing as a dark seam on R_2 ; narrow and very ill-defined dark clouds at origin of Rs, along cord, and on outer end of cell 1st M_2 , chiefly indicated by a darkening of the veins at these points. Macrotrichia on longitudinal veins beyond cord and on distal half of M, Rs except base, and tips of both anal veins. Venation: Sc_1 ending about opposite midlength of the basal section of R_{4+5} , Sc_2 at its tip; Rs relatively long, about twice the long basal section of R_{4+5} ; free tip of Sc_2 and R_2 in transverse alignment; cell 1st M_2 with outer elements subequal and transverse; veins beyond the cell elongate; m-cu at near midlength of cell 1st M_2 ; anal veins generally parallel at bases.

Abdomen brownish black throughout. Cerci relatively small, simple, blackened at bases.

Habitat.—Formosa.

Holotype, female, Hassensan, Taichu-shû, Reimei-Piawaikei-Baibarasan, July 13, 1932 (*Esaki*).

Limonia (*Libnotes*) *griseola* is somewhat similar to *L. (L.) hassensana* Alexander, likewise from Hassensan, but is really a very different fly. The unusually long basal section of R_{4+5} and very gently concave or sinuous vein 2d A furnish important characters, additional to those of coloration of the body, legs, and wings.

LIMONIA (DICRANOMYIA) KONGOSANA sp. nov. Plate 1, fig. 14; Plate 3, fig. 35.

Belongs to the *morio* group; size unusually large (wing, 9 millimeters or over); mesonotal præscutum polished black, the surface very sparsely pruinose; knobs of halteres brownish black; wings with the stigma dark brown, conspicuous, preceded and followed by cream-colored areas; Sc_1 longer than Rs ; abdominal tergites black; male hypopygium with the caudal margin of tergite broadly emarginate, the lateral lobes obtuse; dorsal dististyle terminating in an acute spine; rostral spine of ventral dististyle fasciculate, from an enlarged base.

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

Female.—Length, about 8.5 to 9 millimeters; wing, 9 to 9.5.

Rostrum black, sparsely pruinose; palpi black. Antennæ black throughout; flagellar segments oval. Head light gray; anterior vertex relatively wide.

Mesonotum black, the surface of præscutum very sparsely pruinose so as to dim the polished sclerites that are usual in the group; median region of scutum, base of scutellum, and mediotergite more heavily pruinose. Pleura black, heavily gray pruinose. Halteres elongate, yellow, the knobs brownish black. Legs with the fore coxæ black, their apices yellow; remaining coxæ light yellow; trochanters yellow; femora obscure yellow, the tips rather narrowly brownish black; tibiæ and tarsi brownish black. Wings (Plate 1, fig. 14) with a rather strong brown tinge, the oval stigma dark brown; prearcular region and costal border, including areas before and beyond stigma, more cream-colored; veins brown. Venation: Sc_1 ending opposite origin of Rs , Sc_2 far from its tip, Sc_1 alone about one-third longer than Rs ; free tip of Sc_2 more than its own length basad of R_2 , the section of R_1 between with abundant macrotrichia; m-cu at or close to fork of M; vein 2d A long, gently sinuous.

Abdominal tergites black; sternites obscure brownish yellow. Male hypopygium (Plate 3, fig. 35) with the caudal margin of

the ninth tergite, *9t*, broadly emarginate, the lateral lobes obtuse, with numerous long setæ. Basistyle, *b*, relatively large, its ventromesal lobe conspicuous. Dorsal dististyle, *dd*, strongly bent at near midlength, the apex an acute spine. Ventral dististyle, *vd*, relatively large and fleshy, the rostral prolongation stout, bearing a single powerful fasciculate spine from an enlarged base. Gonapophyses, *g*, with the mesal-apical lobe short. Ædeagus very large, at base with very abundant and dense erect setæ, on the dilated outer portions these much shorter and more scattered.

Habitat.—Korea.

Holotype, male, Kongo San, October 17, 1933 (*Machida*). Allotopotype, female, October 16, 1933. Paratopotypes, 3 females, October 8 to 17, 1933 (*Machida*).

The only near ally of the present fly in the Asiatic fauna is *Limonia* (*Dicranomyia*) *paramorio* (Alexander), which is much smaller, with the stigma pale and inconspicuous, and with a very different structure of the male hypopygium, notably of the dististyles and ædeagus. By Lackschewitz's key to the western Palearctic species of the *morio* group⁹ the present fly runs to couplet 4, including *L. (D.) caledonica* (Edwards) and *L. (D.) styliifera* (Lackschewitz), small species with very distinct male hypopygia. The present fly is by far the largest member of the group so far discovered.

ELLIPTERA ZIPANGUENSIS TAIWANICOLA subsp. nov.

Male.—Length, about 5 millimeters; wing, 7.3.

Characters as in typical *zipanguensis* Alexander, of Hokkaido, differing as follows: Mesonotum and pleura black, the surface sparsely pruinose. Legs black. Wings more strongly tinged with blackish. Venation: R_{2+3} short, poorly indicated, shorter than *r-m*. Abdomen, including sternites and hypopygium, black.

Habitat.—Southern Formosa.

Holotype, male, Keinensan, altitude 5,400 feet, August 17, 1933 (*Issiki*).

The discovery of the occurrence of a true *Elliptera* south of the Tropic of Cancer is of great interest, all other known species being recorded only from north of 30° north latitude. I am

⁹ Ann. Naturhist. Mus. Wien 42 (1928) 218–219.

indebted to Mr. K. Takeuchi for a translation of the paper by S. Iwata,¹⁰ written entirely in Japanese, where the following record is given:

7. *Elliptera*, sp. Distributed throughout the river but more especially in the lower portion. I found larvae, pupae and cast pupal skins.

The species in question, if a true *Elliptera*, may be *Elliptera jacoti* Alexander (Shantung, China; Korea) or *E. zipanguensis* Alexander (Hokkaido) or an undescribed species.

DICRANOPTYCHA NIGROTIBIALIS sp. nov. Plate 1, fig. 15.

General coloration of body dark brown or brownish black, the thorax dusted with yellow pollen; legs with the femora black, the bases obscure yellow, before the tips with indications of a more reddish brown ring; tibiæ and tarsi black; wing strongly tinged with brown, the prearcular and costal regions light yellow; veins dark brown; cell 1st M_2 unusually small, about two-thirds as long as R_s ; R_{1+2} about twice R_2 ; abdomen dark brown.

Female.—Length, about 9.5 millimeters; wing, 10.5.

Rostrum and palpi dark brown. Antennæ light brown; scape yellow pollinose; outer six or seven flagellar segments passing into black; flagellar segments subcylindrical, the longest verticils fully twice the segments. Head yellowish gray; anterior vertex broad, nearly three times the diameter of scape.

Mesonotum dark brown or brownish black, dusted with yellow pollen; præscutum with indications of two narrow intermediate brown stripes; pseudosutural foveæ black, conspicuous. Pleura dark, heavily dusted with pollen, the dorsal pleurites considerably darker than the sternopleurite. Halteres pale, the knobs vaguely darkened. Legs with the coxæ brown, sparsely pollinose; trochanters obscure yellow; femora black, the bases obscure yellow, including about the basal fourth of the segment; indications of a vague, more reddish brown ring before tips of femora; tibiæ and tarsi black; legs with a long erect pubescence. Wings (Plate 1, fig. 15) strongly tinged with brown, the prearcular region and cells C and Sc light yellow; veins dark brown, luteous in the yellow areas. Venation: Cell 1st M_2 unusually small, only about two-thirds the length of R_s ; R_{1+2} about twice R_2 ; m-cu shortly before midlength of cell 1st M_2 .

¹⁰ Aquatic insects of the Kamogawa River, Kyoto. V. Diptera, Trans. Kansai Ent. Soc. 1 (1930) 54.

Abdomen dark brown, including the dorsal shield of ovipositor; cerci horn-colored, relatively short; basal abdominal sternites obscure brownish yellow, the subterminal segments brownish black.

Habitat.—Southern Formosa.

Holotype, female, Fudieda, altitude 4,700 feet, August 13, 1933 (*Issiki*).

Dicranoptycha nigrotibialis is readily told from all other species in eastern Asia by the coloration of the legs. It is not closely allied to any of the three other species in Formosa.

PEDICIINI

DICRANOTA (RHAPHIDOLABIS) PLANA sp. nov. Plate 1, fig. 16; Plate 3, fig. 36.

General coloration light gray, the præscutum with three grayish brown stripes; antennæ black throughout; legs chiefly brownish black, the tarsi somewhat paler; wings with a pale grayish suffusion, the stigma scarcely indicated; R_{2+3+4} longer than r-m; abdomen dark brown; male hypopygium with the median area of tergite nearly transverse; setæ on mesal face of basistyle unusually strong and powerful, especially toward the proximal end; interbase a large, broadly flattened plate.

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

Rostrum and palpi black, the former pruinose. Antennæ black throughout, short; flagellar segments oval, the outer segments broken. Head light gray.

Pronotum gray. Mesonotal præscutum clear blue-gray, with three grayish brown stripes, the median stripe not quite reaching the suture; posterior sclerites of notum dark plumbeous gray. Pleura gray, the dorsopleural membrane brown. Halteres pale, the knobs dusky. Legs with the coxæ gray; trochanters testaceous; femora dark brown, the tips narrowly blackened; tibiæ brown; tarsi elongate, rather pale brown, the outer segments blackened; posterior basitarsi subequal in length to tibiæ. Wings (Plate 1, fig. 16) with a pale grayish suffusion, the prearcular region pale yellow; stigma scarcely indicated, a trifle paler than the ground color, very diffuse; veins brown, more yellowish in the prearcular field. Venation: Sc_1 ending some distance beyond fork of R_{2+3+4} ; Sc_2 far before origin of Rs; Rs rather strongly arcuated; R_2 erect, longer than R_{1+2} ; cell R_3 petiolate, R_{2+3+4} being longer than r-m; m-cu more than one-half its length beyond the fork of M.

Abdomen dark brown. Male hypopygium (Plate 3, fig. 36) with the median region of the tergite, 9t, only slightly protuber-

ant, being virtually transverse, provided with numerous coarse setæ; lateral tergal spines, 9*t*, broad-based, twisted at midlength. Basistyle with setæ of mesal face very strong and powerful, becoming larger toward base of sclerite. Outer dististyle, *od*, with the usual spines; inner dististyle, *id*, with apex flattened into a spatula. Interbase, *i*, large, broadly flattened, shaped about as in the figure, the extreme margins of the two outer lobes very insensibly serrulate.

Habitat.—Southern Formosa.

Holotype, male, Keinensan, altitude 5,400 feet, August 14, 1933 (*Issiki*).

Dicranota (Rhaphidolabis) plana is conspicuously different from the only other described Formosan species of the subgenus, *D. (R.) atripes* Alexander, the hypopygium being very distinct in all details. The group of powerful setæ on mesal face of basistyle is suggestive of the condition in *D. (R.) consors* Alexander, of Honshiu and Kiushiu, but the other structures and body coloration are again very different. The degree of convexity of the median region of the tergite is the slightest known from any of the eastern Asiatic species of *Rhaphidolabis*, excluding the *flavibasis* group, where the caudal border of the tergite is deeply emarginate.

HEXATOMINI

LIMNOPHILA (PRIONOLABIS) HARUKONIS sp. nov. Plate 1, fig. 17; Plate 3, fig. 37.

Size small (wing, male, about 8 millimeters); general coloration polished coal-black; antennæ 13-segmented; knobs of halteres weakly darkened; femora blackened, the bases restrictedly yellow, more extensively so on the posterior legs where about the basal third is included; wings with a strong brown suffusion, only the prearcular region more yellowish; cord and outer end of cell 1st M_2 weakly seamed with dusky; R_2 and R_{1+2} subobsolete; male hypopygium with the caudal margin of tergite evenly emarginate between two blackened tubercles; outer dististyle with a single lateral denticle.

Male.—Length, about 6.5 millimeters; wing, 8.

Rostrum and palpi black. Antennæ black throughout, 13-segmented; basal flagellar segments short-oval, crowded, the outer segments more elongate; terminal segment about one-half longer than the penultimate. Head polished black, the front and anterior vertex little if any pruinose.

Prothorax and mesothorax entirely polished black, without pruinosity. Halteres obscure yellow, the knobs weakly dark-

ened. Legs with the coxæ and trochanters polished black; femora black, the bases narrowly pale, narrowest on forelegs, a little more extensive on the hind femora where about the basal third is brightened; tibiæ dark brown, the tips narrowly blackened; tarsi dark brown. Wings (Plate 1, fig. 17) with a strong brown suffusion, only the prearcular region yellower; stigma very poorly defined; origin of Rs, cord, and outer end of cell 1st M_2 very vaguely seamed with dusky; veins brownish black, more luteous in the prearcular field. Venation: R_2 and R_{1+2} both so faint as to be scarcely visible, apparently subequal, as figured; petiole of cell M_1 longer than the cell; m-cu at near midlength of cell 1st M_2 .

Abdomen, including hypopygium, polished black. Male hypopygium (Plate 3, fig. 37) with the caudal margin of tergite, 9t, produced into a small blackened tubercle on either side of the median line, the space between gently and evenly emarginate. Outer dististyle, *od*, with a single lateral tooth, which is strongly developed into a curved black spine. Inner dististyle, *id*, before the obtuse blackened apical point bearing a slender tubercle that is tridentate at apex.

Habitat.—Formosa.

Holotype, male, Hassensan, Reimei, July 13, 1932 (*Esaki*).

This distinct species is named in honor of Miss Haruko Esaki, eldest daughter of Professor Teiso and Mrs. Lotte Esaki. It is very different from the other species having 13-segmented antennæ (*imanishii* Alexander, *luteibasalis* Alexander) being more generally similar to *Limnophila* (*Prionolabis*) *oritropha* Alexander, a larger, yellow-winged species from the high mountains of Formosa. The diagnostic features listed above are sufficient to separate the fly from all allied forms. The males of *L. (P.) luteibasalis* and *L. (P.) odai* Alexander have the median region of the tergite narrowly and weakly trilobed, quite different from the condition found in other Japanese and Formosan species of *Prionolabis*.

HEXATOMA (ERIOCERA) MASAKII sp. nov. Plate 1, fig. 18.

Belongs to the *chirothecata* group; general coloration of mesonotal præscutum and scutum black, the pleura and posterior sclerites of mesonotum more brownish; head and abdominal tergites uniformly orange; antennæ (male) about twice as long as the wing, the basal four segments light yellow, the incisures of the basal two flagellar segments narrowly darkened; outer flagellar segments more uniformly darkened; flagellar segments

without spinous armature, only with conspicuous setæ that become longer on the outer segments; femora yellow, the tips narrowly but conspicuously blackened; wings tinged with brown, the costal border broadly darker brown, this color continued to the wing tip; abdominal tergites orange, the lateral borders and centers of the sternites variegated with black.

Male.—Length, about 11 millimeters; wing, 9.5; antenna, about 19.

Rostrum short, orange; palpi dark brown. Antennæ (male) elongate, approximately twice the length of the wing; scape, pedicel, and basal two flagellar segments yellow, the incisures narrowly but conspicuously dark brown; terminal segments more uniformly infuscated; flagellar segments with delicate scattered setæ only, without spines as is usual in the genus; setæ of outer segments much longer and more conspicuous than on the basal segments. Head orange; vertical tubercle very weakly notched at summit.

Pronotum and mesonotal præscutum and scutum blackened, the surface rather polished; scutellum and mediotergite more brownish. Pleura brown, the dorsal sclerites darker. Halteres black. Legs with the coxæ yellowish brown; trochanters obscure yellow; femora yellow, the tips narrowly but conspicuously blackened; tibiæ obscure yellow, the tips narrowly infuscated; basitarsi obscure yellow, the outer tarsal segments passing into black. Wings (Plate 1, fig. 18) with a brown tinge, the entire costal border to the wing tip conspicuously darker brown, this including cells C and Sc and the stigma; origin of Rs, cord and outer end of cell 1st M_2 more weakly suffused with brown; cell Cu paler than remainder of disk; veins brown. Macrotrichia of veins abundant, including complete series on all longitudinal radial veins beyond cord and more-scattered series on the outer sections of M_{1+2} and M_3 . Venation: Rs elongate, considerably exceeding R; R_{2+3} longer than R_2 ; R_{1+2} longer than R_{2+3} but shorter than R_{2+3+4} ; m-cu more than one-half its length beyond the fork of M.

Abdominal tergites orange, the lateral borders of segments narrowly blackened; sternites orange, the lateral borders darkened; segments two to seven each with a conspicuous median blotch; hypopygium more brownish orange.

Habitat.—Korea.

Holotype, male, Suigen, August 4, 1930 (*Tabashi*); No. 23.

The present fly is named in honor of Prof. Jujiro Masaki, who has added considerably to our knowledge of the Korean Tipulidæ. The species is very different from all other regional species with elongate antennæ in the male sex in the nonspinous flagellar segments, in conjunction with the rather striking coloration of the body and wings. I would believe it to be most nearly allied to *Hexatoma (Eriocera) kolthoffi* Alexander (eastern China: Kiangsu), of which only the female sex is known to this date. This latter fly differs in the yellow head, with entire vertical tubercle, the uniformly black legs, and the brownish black abdomen. It will be of interest to learn whether this species also has elongate antennæ, with reduced vestiture, as in the present fly.

ERIOPTERINI

CLADURA (CLADURA) MACHIDELLA sp. nov. Plate 1, fig. 19.

General coloration of entire body black, sparsely dusted with gray; fore femora black, only the extreme bases obscure yellow; posterior femora with outer third blackened; tarsi black; wings yellow, patterned with brown on the crossveins and distal two-thirds of Cu; supernumerary or adventitious crossveins in cells R_3 and R_4 in approximate alignment with R_2 .

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

Rostrum and palpi black. Antennæ black, only the extreme base of the first flagellar segment pale; flagellar segments cylindrical; terminal segment less than one-half as long as the penultimate. Head dark gray.

Mesonotum and pleura black, sparsely pruinose. Halteres pale yellow, the knobs very weakly darkened. Legs with the fore coxæ darkened, pale apically; remaining coxæ and all trochanters yellow; fore femora black, only the extreme bases obscure yellow; middle legs broken; posterior femora obscure yellow, the outer third blackened; tibiæ brown, the tips darker brown; basitarsi dark brown, the tips and all outer tarsal segments black. Wings (Plate 1, fig. 19) strongly tinged with yellow, the basal and costal portions brighter yellow; a conspicuous dark brown pattern, appearing as seams to the crossveins and certain of the longitudinal veins, as follows: Origin of R_s ; cord; outer end of cell 1st M_2 ; Sc_2 ; fork of R_{2+3+4} ; R_2 ; the supernumerary crossveins in cells R_3 and R_4 ; smaller dark spots at tips of veins R_{1+2} , R_3 , and R_4 ; a broad, conspicuous, dark seam beginning at about one-third the length of vein Cu, extending uninterrupted to margin, slightly invading cell M and filling the

entire space between veins Cu_1 and Cu_2 ; veins yellow, dark in the clouded areas. Venation: Sc relatively long, Sc_1 ending about opposite m, Sc_2 opposite the fork of R_{2+3+4} ; in the unique type, two supernumerary or adventitious crossveins, one each in cells R_3 and R_4 , lying in almost perfect alignment with R_2 (in direct alignment in one wing; the element in cell R_3 just distad of the others, as figured, on the opposite side); r-m strongly arcuated and weakly spurred; petiole of cell M_1 slightly longer than m; m-cu shortly beyond the fork of M.

Abdomen black, the pleural membrane conspicuously more buffy yellow. Genital segment brownish yellow; valves of ovipositor reddish horn-color.

Habitat.—Japan (Honshiu).

Holotype, female, Mount Hiei, Kyoto, October 30, 1933 (*Machida*).

This strikingly distinct fly is named in honor of my friend Prof. Jiro Machida, to whom I am greatly indebted for kindly coöperation in studying the Tipulidæ of the Japanese Empire. It is the eighth Japanese and Formosan species of the genus to be described and is readily told from all other members of *Cladura* in the black coloration of the body and the chiefly black legs. It seems probable that the crossveins in the radial field of the wing may prove to be adventitious rather than supernumerary, a comparable condition being found in the genotype, *Cladura flavoferruginea* Osten Sacken, of eastern North America. This was studied by Alexander and Leonard¹¹ and the venation as regards crossveins was found to be remarkably plastic.

TRENTEPOHLIA (TRENTEPOHLIA) FUSCOBASALIS sp. nov. Plate 1, fig. 20.

Belongs to the *trentepohlii* group; characters as in *trentepohlii*, but basal segments of abdomen uniformly dark brown, almost as intense in color as the outer blackened segments.

Male.—Length, about 5.5 millimeters; wing, 5.4.

Female.—Length, about 7 millimeters; wing, 5.3.

Rostrum and labial palpi yellow; maxillary palpi darker. Antennæ black; flagellar segments long-oval to subcylindrical. Head dark gray; anterior vertex reduced to a linear strip or virtually lacking.

Mesonotal præscutum rather bright brown, more yellowish laterally; scutal lobes, scutellum, and mediotergite darker brown. Pleura brown, the posterior sclerites more yellowish. Halteres

¹¹ Journ. N. Y. Ent. Soc. 20 (1912) 36-39, pl. 4.

chiefly pale, the knobs slightly dusky. Legs with the fore coxæ pale brown, the remaining coxæ and all trochanters yellow; remainder of legs yellow, the terminal tarsal segments blackened. Wings (Plate 1, fig. 20) yellowish white, the costal region light yellow; wing tip, including radial and medial fields, more uniformly infuscated; narrow brown seams along cord and vein Cu; vein $R_{4+5} + M_{1+2}$ narrowly seamed with dark brown, interrupting the otherwise pale band beyond cord; center of cell R_3 scarcely brightened; veins brown, luteous in the costal field. Venation: All veins in region of stigma so faint as to be virtually obliterated, the outer end of R, R_{1+2} , and R_2 being obsolete or nearly so; outer four-fifths of R_{2+3+4} very pale and semiatrophied but evident; cell 2d A relatively wide.

Basal abdominal segments dark brown, the outer segments a little more blackened.

Habitat.—Formosa.

Holotype, male, Tansui, October 29, 1933 (*Issiki*).

Allotype, female, Jitsugetsutan (Lake Candidius or Dragon Lake), November 4, 1932 (*Machida*).

This species, or perhaps race, has undoubtedly been confused in Formosa with *Trentepohlia* (*Trentepohlia*) *trentepohlii* (Wiedemann), which has the basal segments of the abdomen yellow or reddish yellow. The dark color of the basal abdominal segments of the present fly is not quite as intense as in the otherwise distinct *T. (T.) pictipennis* Bezzi (Luzon to Papua). The insect fauna of Lake Candidius has been well considered by Takahashi.¹²

Genus GONOMYIA Meigen

Subgenus PROTOGONOMYIA subgen. nov.

Characters much as in *Progonomyia* Alexander, differing especially in the short fleshy valves of the ovipositor. In all other subgeneric groups of *Gonomyia*, the valves are elongate, with acutely pointed cerci. Wings with cell R_3 deep, almost as in the genus *Gnophomyia*, the branches inclosing the cell subparallel or but slightly divergent on basal half; cell 1st M_2 open by atrophy of basal section of M_3 ; m-cu close to fork of M.

Type of subgenus.—*Gonomyia confluenta* Alexander (Oriental Region: Formosa).

Other included species: *Gonomyia (Protonomyia) clitellata* sp. nov.; *G. (P.) nigripes* Brunetti (includes *nigra* Brunetti,

¹² Trans. Nat. Hist. Soc. Formosa 20 No. 108 (1930) 145-156.

incompleta Brunetti, and probably *gracilis* Brunetti); *G. (P.) perturbata* Alexander; and *G. (P.) scutellum-album* Alexander.

Gonomyia tenebrosa Edwards has the valves of the ovipositor elongate and sclerotized and should be retained in *Progonomyia*. The subgeneric position of *G. brunnescens* Edwards is still uncertain as the female has not been described.

GONOMYIA (PROTOGONOMYIA) CLITELLATA sp. nov. Plate 1, fig. 21; Plate 3, fig. 38.

Size small (wing, male, 4.5 millimeters); præscutum, scutum, and mediotergite black, the scutellum, pleura, and pleurotergite abruptly yellow; head black, dusted with gray; knobs of halteres orange-yellow; wings with a faint brown tinge; Sc_1 extending to about opposite midlength of R_s ; R_{2+3+4} about twice the basal section of R_5 ; abdominal tergites black, the hypopygium and sternites yellow; male hypopygium with the spine of the inner dististyle long and acute; ædeagus slender, terminating in a small, acute, recurved spine.

Male.—Length, about 4 millimeters; wing, 4.5.

Rostrum and palpi black. Antennæ of moderate length, black throughout; flagellar segments oval. Head black, dusted with gray, more heavily so on anterior portions.

Pronotum brownish yellow, a little darker in front; anterior lateral pretergites clear light yellow. Mesonotal præscutum and scutum intense black, the surface somewhat opaque by a sparse bloom; scutellum light yellow, the parascutella darkened; mediotergite black. Pleura and pleurotergite yellow, somewhat more reddish yellow on ventral anepisternum and ventral sternopleurite. Halteres pale, the knobs orange-yellow. Legs with the fore and middle coxæ reddish yellow, the posterior coxæ clearer yellow; trochanters obscure yellow; remainder of legs broken. Wings (Plate 1, fig. 21) with a faint brown tinge; veins pale brown. Macrotrichia on all veins beyond cord; on R_s except basal fifth, distal third of M , and about the outer half of $2d A$; vein $1st A$ without trichia. Venation: Sc_1 extending to about opposite midlength of R_s , Sc_2 not clearly apparent and omitted from figure; R_s very long; R_{2+3+4} about twice the basal section of R_5 ; cell M_1 longer than its petiole; $m-cu$ close to fork of M .

Abdominal tergites black, the eighth and ninth tergites, including hypopygium, more yellowish; sternites yellow. Male hypopygium (Plate 3, fig. 38) with the basistyle, *b*, produced beyond the level of the insertion of the dististyles as a scooplike expanded blade, the apex obtuse; ventromesal lobe with retrorse setæ. Outer dististyle, *od*, yellow, gradually narrowed to the

apical spinous point, the lower or concave edge at midlength with abundant delicate setulæ. Inner dististyle, *id*, bifid at midlength, the shorter arm conspicuously setiferous, the longer arm decussate, appearing as a slender straight spine. *Ædeagus*, *a*, apparently slender, not highly compressed as in *scutellum-album*, the apex terminating in an acute recurved spine.

Habitat.—Northern Formosa.

Holotype, male, Rimosan, May 2, 1933 (*Issiki*).

Gonomyia (*Protogonomyia*) *clitellata* is very different from all other described members of the group. The peculiar thoracic pattern, together with the structure of the hypopygium, will readily serve to distinguish the species from the allied regional forms.

GONOMYIA (GONOMYIA) SEKIANA sp. nov. Plate 1, fig. 22; Plate 3, fig. 39.

Belongs to the *cognatella* group; antennæ black, the basal segments brighter; pleura with a broad whitish longitudinal stripe; knobs of halteres light yellow; legs black; abdominal tergites bicolorous, dark brown, the caudal borders conspicuously pale yellow; male hypopygium with three dististyles, the outer terminating in a curved black spine and bearing a lateral tooth at near two-thirds the length; phallosome large and conspicuous, more or less hood-shaped.

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

Rostrum and palpi black. Antennæ black, the basal segments more obscure orange; antenna relatively long and slender, if bent backward extending about to wing root; flagellar segments long-oval, with an abundant short dense pubescence and long, unilaterally arranged verticils, one to each segment. Head with center of vertex darkened, the remainder obscure orange.

Pronotum pale yellow above, darkened laterally and beneath. Anterior lateral pretergites pale yellow. Mesonotal præscutum and scutum black, dusted with gray, the humeral and narrow lateral regions obscure yellow; median region of scutum obscure yellow; scutellum darkened basally, the broad posterior border yellow; mediotergite dark, with a narrow pale V-shaped transverse area at near midlength. Pleura with a broad whitish longitudinal stripe extending from behind the fore coxæ, crossing the dorsal sternopleurite, ventral pteropleurite, onto the meral region; dorsal anepisternum and ventral sternopleurite dark brown; remaining posterior sclerites of pleura more reddish brown. Halteres dusky, the knobs light yellow. Legs with the coxæ testaceous yellow; trochanters brownish yellow; femora

brownish black; tibiæ and tarsi black. Wings (Plate 1, fig. 22) with a pale brown tinge; prearcular region and cells C, Sc, and Cu_1 light yellow; stigma and vague seams along cord very pale brown; veins brown, yellow in the luteous areas. Macrotrichia relatively abundant on R_4 , R_5 , all outer branches of M and Cu, outer ends of both anal veins, almost the whole length of R_{2+3+4} and Rs, and on outer ends of M and basal section of Cu_1 . Venation: Sc_1 ending opposite origin of Rs, Sc_2 close to its tip; m-cu shortly before fork of M.

Abdominal tergites dark brown, the caudal borders of the segments conspicuously pale; hypopygium yellow; sternites more uniformly yellow. Male hypopygium (Plate 3, fig. 39) with the outer angle of basistyle, *b*, produced into a long pale rod that is provided along its margin near base with about eight long powerful spinous setæ. Three dististyles, the outer, *od*, long and slender, terminating in a curved blackened point, at near two-thirds the length bearing a small acute spinous point; intermediate style, *md*, even longer, twisted on its own axis at base and again at proximal end of the long terminal black spine; inner style, *id*, shortest, its lower margin fringed with strong setæ; at near four-fifths the length with a long powerful spinous seta, at apex with other shorter but still powerful setæ. Phallosome, *p*, a very large, pale, more or less hood-shaped structure, shaped about as in figure.

Habitat.—Southern Formosa.

Holotype, male, Sekisan, altitude 6,000 feet, August 15, 1933 (*Issiki*).

The present fly is the first member of the *cognatella* group to be discovered in the Japanese Empire. It differs from the other regional species in eastern Asia, with the exception of *aperta* Brunetti, by the conspicuous yellow knobs of the halteres. From the latter species, of which the male hypopygium has not been adequately described, the present fly differs in the details of coloration of the thorax, the black legs, and, if Bagchi's figure of the venation is correct, in the venation, as the less strongly arcuated Rs, very strongly arcuated R_{2+3+4} , and oblique R_3 . The male hypopygium is much larger and more complex in structure than in *Gonomyia* (*Gonomyia*) *subcognatella* Alexander, of western China.

ERIOPTERA (ILISIA) LULIANA sp. nov. Plate 1, fig. 23; Plate 3, fig. 40.

Allied to *incongruens*; mesonotum and pleura light gray, with three velvety black longitudinal stripes, one on lateral borders

of præscutum and scutum, the other two more ventral, on pleura; femora yellow, the fore femora with two brown annuli, inclosing a narrow yellow subterminal ring; middle and posterior femora with a narrow brown subterminal ring; wings whitish subhyaline, with major ocelliform areas bordered by brown but without brown dots elsewhere in the cells; cell 1st M_2 small; male hypopygium with the tergite deeply split medially; gonapophyses slender, the margins smooth.

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

Rostrum and palpi black. Antennæ with basal segment black, succeeding segments pale brown, the outer four or five segments again blackened. Head brownish gray.

Mesonotal præscutum light gray, with indications of two intermediate and two nearly lateral brown stripes that are present on posterior half of sclerite only; lateral borders of præscutum and scutum broadly and conspicuously intense velvety black; pseudosutural foveæ and tuberculate pits black; posterior sclerites of notum light gray, the central portions of scutal lobes and posterior border of scutellum more darkened. Pleura gray, traversed by two longitudinal velvety black stripes, the more dorsal extending from the fore coxæ across the ventral anepisternum and pteropleurite to pleurotergite; ventral stripe occupying the ventral sternopleurite and upper meral region; besides these two major stripes, the gray pruinosity is further lined with minor dark stripes on the more ventral gray vitta and on the ventral part of meron; dorsopleural membrane brown. Halteres yellow, the knobs very weakly darkened. Legs with the coxæ black, the posterior pair more pruinose; trochanters brownish black, more darkened beneath; fore femora yellow, with a broad dark brown ring at midlength, together with a paler brown ring at apex, its more basal portion darker, the two rings inclosing a narrow yellow subterminal annulus; middle and hind femora yellow, with a narrow brown subterminal ring; fore tibiæ yellow, a little infuscated near base; remainder of tibiæ and tarsi yellow, the outer tarsal segments black. Wings (Plate 1, fig. 23) whitish subhyaline; cells C and base of Sc uniformly infumed with pale brown; a conspicuous ocelliform pattern, beyond the cord with the central portions light brown, narrowly bordered by darker brown; basad of cord, the centers of the areas are of the ground color, their position and size indicated only by the dark borders; the largest of these areas lie at origin of Rs, anterior cord, and tip of Sc; stigmal area at end of

R_{1+2} ; an oblique crossband before wing tip, extending from outer end of cell R_2 into extreme outer angle of cell M_4 ; wing margin in outer ends of cells R_5 to M_3 darkened; other pale circles at outer ends of cells M_4 , Cu, and 2d A, and at tip of vein 1st A; no dark dots on wing excepting one or two along vein Cu; veins yellow, darker in the infuscated areas, as along the cord, outer end of cell 1st M_2 and outer end of vein 2d A. Venation: Cell 1st M_2 unusually small, the second section of vein M_{1+2} being less than two-fifths of the outer section; m-cu more than one-half its length before fork of M.

Abdomen chiefly dark brown, the lateral borders of tergites more reddish brown; hypopygium light yellow. Male hypopygium (Plate 3, fig. 40) with the ninth tergite, 9t, entirely pale, with a deep median split, the lateral lobes thus formed broadly truncate. Outer dististyle, *od*, relatively slender, gently arcuated. Inner dististyle, *id*, entirely pale, with a long retrorse seta at apex. Gonapophyses appearing as slender smooth black horns, *p*, their tips gently incurved, on mesal face near base produced into a weak denticle.

Habitat.—Central Formosa.

Holotype, male, Hassensan, Taichû-shû, Reimei, July 12, 1932 (*Esaki*).

This beautiful *Ilisia* is named in honor of Miss Luli Esaki, youngest daughter of Professor and Mrs. Teiso Esaki. The only near ally in eastern Asia is *Erioptera (Ilisia) incongruens* Alexander (Honshiu), which differs in the brown coloration of the mesothorax, the thickly dotted interspaces of the wings, the large cell 1st M_2 , the differently patterned legs, and the structure of the male hypopygium, especially the stout, approximated apophyses with the surface microscopically roughened, and the group of about a dozen long slender spines grouped on either side of the median line at base of the phallosome.

MOLOPHILUS EPHIPPIGER sp. nov. Plate 1, fig. 24; Plate 3, fig. 41.

Belongs to the *gracilis* group and subgroup; mesonotum black, contrasting abruptly with the reddish yellow pleura and pleurotergite; male hypopygium with the dorsal lobe of basistyle low, nonspinous; outer dististyle a simple sinuous rod, with abundant serrulations on the distal two-thirds; inner dististyle black, the apex split into two slightly divergent black spines.

Male.—Length, about 3.5 millimeters; wing, 4.5.

Female.—Length, about 4 millimeters; wing, 4.5.

Rostrum pale brown; palpi black. Antennæ short; scape light yellow, pedicel light brown, flagellum dark brown; flagellar segments oval. Front and anterior part of vertex light yellow, the remainder of vertex and the occiput dark plumbeous gray.

Pronotum and anterior lateral pretergites yellow. Mesonotal præscutum and scutum entirely polished black, the remaining sclerites of notum black, but slightly more opaque by a sparse pruinosity; lateral portions of mediotergite brightened. Pleura, including the dorsopleural membrane and pleurotergite, pale reddish yellow, contrasting abruptly with the notum. Halteres yellow, the knobs and outer portions of stems a little darkened, with pale setæ. Legs with the coxæ and trochanters yellow, femora brown, paler basally, darkened toward tips, with dark setæ; tibiæ brown, darker toward tips; tarsi black. Wings (Plate 1, fig. 24) with a faint brown tinge, the prearcular and costal regions light yellow; veins pale brownish yellow, the macrotrichia darker brown. Venation: R_2 in transverse alignment with r-m; petiole of cell M_3 nearly three times m-cu; vein 2d A ending opposite posterior end of m-cu.

Abdominal tergites dark brown medially, the intermediate segments broadly yellow laterally; sternites yellow, somewhat darker in female; hypopygium brownish yellow. Male hypopygium (Plate 3, fig. 41) with the dorsal lobe, *db*, of basistyle low, nonspinous, its apex subacute but entirely pale and with setæ to apex; mesal lobe with dense setulæ; ventral lobe, *vb*, longest, at apex with conspicuous retrorse setæ and with a row of erect setæ along margin. Outer dististyle, *od*, a simple, sinuous, ribbonlike rod, yellow on basal third, the remainder blackened; outer margin and surface on blackened portions with microscopic serrulations, on inner edge more limited to distal third. Inner dististyle, *id*, a shorter blackened rod, the apex split into two slightly divergent, acute, black spines that are slightly unequal in length and diameter. Ædeagus long and slender.

Habitat.—Central Formosa.

Holotype, male, Rantaisan, altitude 7,000 feet, May 16, 1933 (*Issiki*). Allotopotype, female, in copula with male.

Molophilus ephippiger is very different from all other regional species in the black mesonotum, contrasting abruptly with the pale pleura, and in the structure of the male hypopygium, notably the bifid inner dististyle.

ILLUSTRATIONS

[*a*, \mathcal{A} edeagus; *b*, basistyle; *d*, dististyle; *dd*, dorsal dististyle; *db*, dorsal lobe of basistyle; *g*, gonapophysis; *i*, interbase; *id*, inner dististyle; *md*, intermediate dististyle; *od*, outer dististyle; *p*, phallosome; *s*, sternites; *t*, tergites; *vb*, ventral lobe of basistyle.]

PLATE 1

- FIG. 1. *Trichocera mirabilis* sp. nov., venation.
2. *Dictenidia inæquiptinata* sp. nov., venation.
3. *Dolichopeza* (*Dolichopeza*) *issikiella* sp. nov., venation.
4. *Dolichopeza* (*Mitopeza*) *taiwanicola* sp. nov., venation.
5. *Tipula* (*Trichotipula*) *haplotricha* sp. nov., venation.
6. *Tipula* (*Vestiplex*) *nestor* sp. nov., venation.
7. *Tipula* (*Vestiplex*) *parvaviculata* sp. nov., venation.
8. *Tipula* (*Oreomyza*) *koreana* sp. nov., venation.
9. *Tipula* (*Oreomyza*) *obnata* sp. nov., venation.
10. *Limonia* (*Limonia*) *melas* sp. nov., venation.
11. *Limonia* (*Limonia*) *tabashii* sp. nov., venation.
12. *Limonia* (*Libnotes*) *basistrigata* sp. nov., venation.
13. *Limonia* (*Libnotes*) *griseola* sp. nov., venation.
14. *Limonia* (*Dicranomyia*) *kongosana* sp. nov., venation.
15. *Dicranoptycha nigrotibialis* sp. nov., venation.
16. *Dicranota* (*Rhaphidolabis*) *plana* sp. nov., venation.
17. *Limnophila* (*Prionolabis*) *harukonis* sp. nov., venation.
18. *Hexatoma* (*Eriocera*) *masakii* sp. nov., venation.
19. *Cladura* (*Cladura*) *machidella* sp. nov., venation.
20. *Trentepohlia* (*Trentepohlia*) *fuscobasalis* sp. nov., venation.
21. *Gonomyia* (*Protogonomyia*) *clitellata* sp. nov., venation.
22. *Gonomyia* (*Gonomyia*) *sekiana* sp. nov., venation.
23. *Erioptera* (*Ilisia*) *luliana* sp. nov., venation.
24. *Molophilus ephippiger* sp. nov., venation.

PLATE 2

- FIG. 25. *Trichocera mirabilis* sp. nov., male hypopygium.
26. *Tipula* (*Trichotipula*) *haplotricha* sp. nov., male hypopygium, details.
27. *Tipula* (*Vestiplex*) *nestor* sp. nov., male hypopygium, details.
28. *Tipula* (*Vestiplex*) *parvaviculata* sp. nov., male hypopygium, details.
29. *Tipula* (*Vestiplex*) *parvaviculata* sp. nov., male hypopygium, details.
30. *Tipula* (*Acutipula*) *obtusiloba* sp. nov., male hypopygium, details.
31. *Tipula* (*Oreomyza*) *koreana* sp. nov., male hypopygium, details.
32. *Tipula* (*Oreomyza*) *obnata* sp. nov., male hypopygium, details.

PLATE 3

- FIG. 33. *Limonia (Limonia) melas* sp. nov., male hypopygium.
34. *Limonia (Limonia) tabashii* sp. nov., male hypopygium.
35. *Limonia (Dicranomyia) kongosana* sp. nov., male hypopygium.
36. *Dicranota (Rhaphidolabis) plana* sp. nov., male hypopygium.
37. *Limnophila (Prionolabis) harukonis* sp. nov., male hypopygium.
38. *Gonomyia (Protogonomyia) clitellata* sp. nov., male hypopygium.
39. *Gonomyia (Gonomyia) sekiana* sp. nov., male hypopygium.
40. *Erioptera (Ilisia) luliana* sp. nov., male hypopygium.
41. *Molophilus ephippiger* sp. nov., male hypopygium.

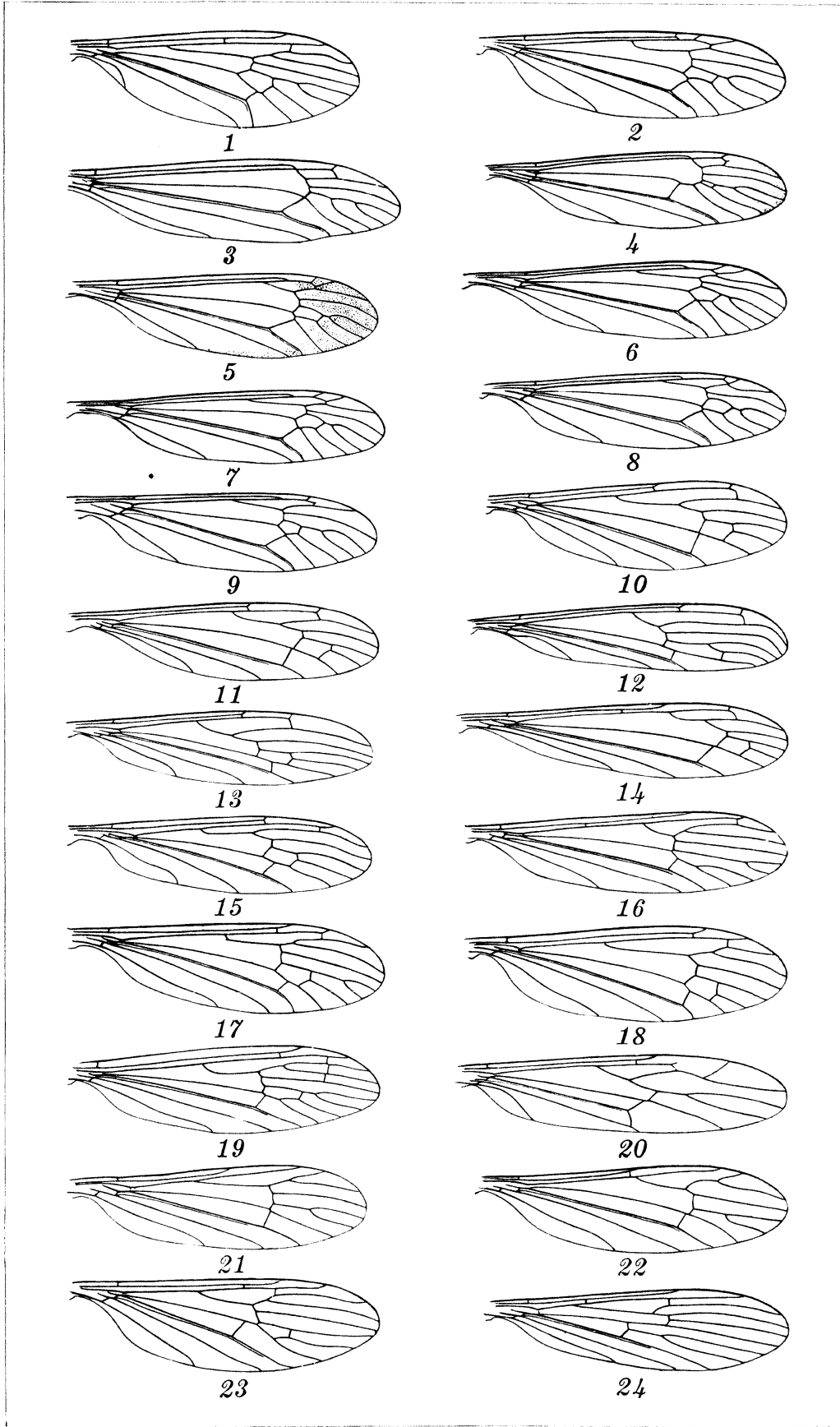


PLATE 1.

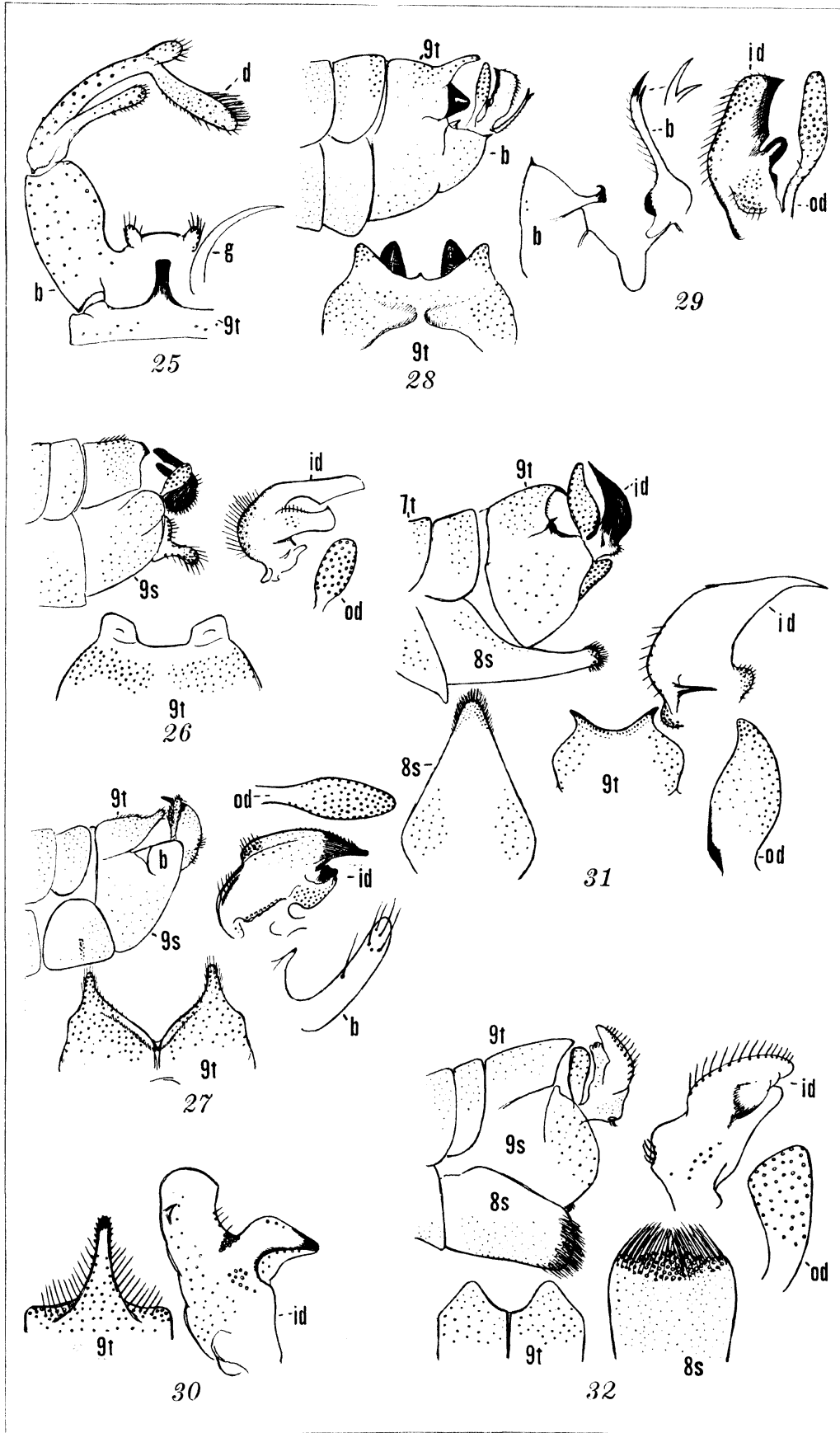


PLATE 2.

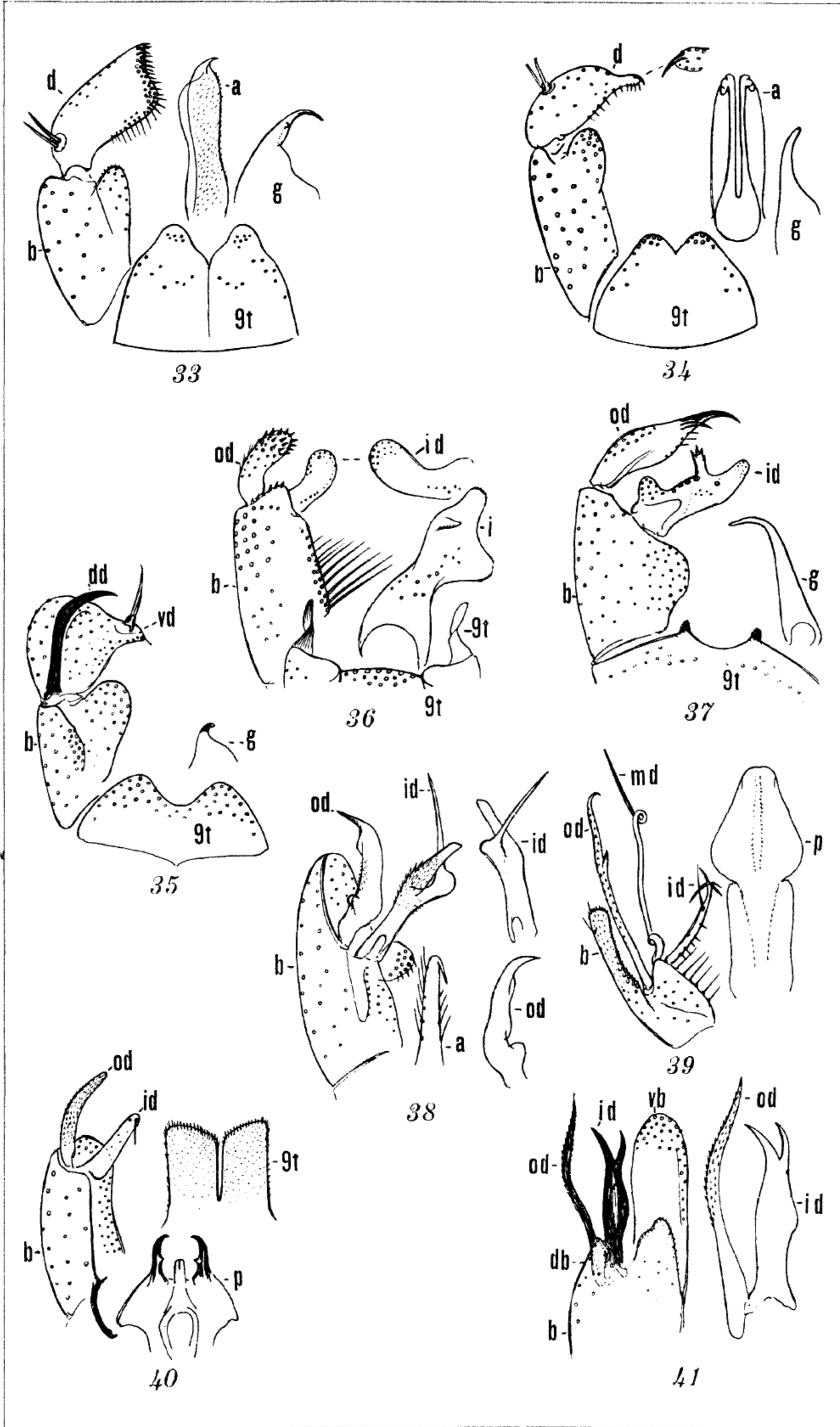


PLATE 3.