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NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN
ASIA (DIPTERA), XXII¹

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THREE PLATES

The crane flies discussed herewith are chiefly from Celebes Island, where they were collected by my friend and colleague Mr. Charles F. Clagg. A further considerable series of species are from Formosa where they were secured by Messrs. Esaki, Gressitt, and Issiki. One further species is from Korea where it was taken by Professor Masaki. The Esaki material has been returned to Professor Esaki for incorporation in the collection of the zoölogical laboratory, Kiushiu Imperial University; all other species are preserved in my own extensive series of these flies through the friendly interest of the various collectors.

TIPULINÆ

TIPULA (LUNATIPULA) MULTIBARBATA sp. nov. Plate 1, fig. 1; Plate 2, figs. 25, 26.

Belongs to the *marmoratipennis* group; antennæ weakly bicolorous, the bases of the flagellar segments narrowly pale; præscutal stripes four in number, gray, narrowly bordered by brown; femora yellow, the tips narrowly brownish black; wings creamy white, heavily marmorate with pale brown and darker brown clouds; male hypopygium with conspicuous brushes of long yellow setæ on the tergite and on the eighth sternite, the latter sclerite extensive but not extended far caudad into a boat-shaped structure, as is the case in certain other species of the group.

Male.—Length, about 15 millimeters; wing, 21.

Frontal prolongation of head brownish, the long strong nasus chiefly yellow; palpi yellow, the outer segments somewhat darker. Antennæ of moderate length, if bent backward extending to some distance beyond wing root; scape and pedicel yellow; flagellar segments dark brown, the extreme proximal ends of the basal enlargements yellow, to produce a weak bicolorous ap-

¹ Contribution from the entomological laboratory, Massachusetts State College.

pearance; longest verticils subequal to the segments; last flagellar segment approximately one-half as long as the penultimate. Head light ashy gray, the center of vertex extensively cinnamon-brown, with a further dark brown, capillary, median vitta.

Mesonotal præscutum light gray, with four distinctly separated, darker gray stripes that are narrowly bordered by brown; scutal lobes gray, with darker gray central areas; posterior sclerites of notum gray, with a capillary brown median vitta. Pleura gray, the dorsopleural region rather light brown. Halteres yellow, the base of knob brown, the apex yellowish. Legs with the coxæ yellowish, sparsely pruinose; trochanters yellow; femora yellow, the tips narrowly brownish black, somewhat lighter on the flexor surface; tibiæ brownish yellow, the tips narrowly and rather weakly infuscated; tarsi passing into brownish black. Wings (Plate 1, fig. 1) with the ground color whitish cream, variegated with pale brown and darker brown, the general appearance being rather heavily marmorate; cell Sc uniform yellow, contrasting with the whitish cell C; post-arcular darkening in bases of cells R and M restricted; stigma brown, its central portion more yellow; the darkened clouds leave a narrow oblique band of the ground color extending from behind origin of Rs to the wing margin in cell 1st A; veins brown. Macrotrichia of veins relatively small and weak, on R₃ restricted to two or three near outer end of vein; squama with about sixteen to eighteen strong black setæ. Venation: Free tip of Sc₂ far before R₁₊₂, so cell Sc₂ at costa is unusually extensive; Rs elongate, exceeding twice m-cu; vein R₃ rather strongly arcuated, slightly narrowing cell R₃ at near midlength; cell 1st M₂ relatively long, m being much longer than the basal section of M₁₊₂; m-cu at fork of M₃₊₄.

Abdominal tergites one to five light grayish yellow, each with an interrupted brown median dash, the lateral borders of tergites one to two narrowly dark brown; lateral borders of tergites narrowly silvery gray, increasing in area on the outer segments; sixth and succeeding tergites passing into brownish black; sternites with basal five segments yellow, the outer ones darker. Male hypopygium (Plate 2, fig. 25) with the ninth tergite, 9t, fused with the sternite, 9s, on posterior half; basistyle and the small sternite entirely fused. Ninth tergite (Plate 2, fig. 25, 9t) narrow, constricted by pale membrane on cephalic portion; caudal margin with a median and two lateral lobes that are densely set with short blackened setæ; behind or ce-

phalad of these three cushions, on either side of midline, a transverse group of long conspicuous erect yellow setæ; viewed laterally, the median black cushion is seen to lie farther cephalad than the more-projecting lateral pair. Outer dististyle broad on basal half, the outer half more narrowed, the inner face set with small black spines, of which the outer two or three are larger and more conspicuous. Inner dististyle, *id.*, about as shown, the outer angle a powerful black spine; viewed separately and in a flattened condition, the style appears conspicuously bilobed on inner margin, with a deep U-shaped emargination separating the lobes. Eighth sternite (Plate 2, fig. 26, 8s) very extensive, sheathing, the lateral edges extending high up over the sides of the ninth sternite, the outer lateral angles produced into pale bulbous lobes that are set with abundant long pale setæ; median area of sternite truncate, with a transverse row of long yellow setæ.

Habitat.—Korea.

Holotype, male, Shorei, July 9, 1923 (*J. Masaki*).

The *marmoratipennis* group includes, besides the typical form and the present fly, three Japanese species, *holoteles* Alexander, *naviculifer* Alexander, and *shogun* Alexander, that are among the most beautiful and conspicuous of all Japanese species of *Tipula*. The group is best distinguished by the short, fleshy valves of the ovipositor, and by certain venational details, as the unusually long Rs and the more or less arcuated vein R₃, which tends to narrow cell R₃. I have been privileged to study both the type and paratype of *marmoratipennis* Brunetti (holotype, female, Darjiling, altitude 7,000 feet, May, 1910—not "April" as stated by Brunetti—paratype, female, Darjiling, August 7, 1909), through the friendly interest of the authorities of the Indian Museum.

The present fly is very different from the other Japanese species listed above. The male hypopygium is quite distinct, notably the eighth sternite, which, while very extensive and sheathing, yet is not at all narrowed into a boat-shaped median lobe as in the other species (male sex not yet known in *holoteles*).

DOLICHOPEZA (NESOPEZA) TOALA sp. nov. Plate 1, fig. 2; Plate 2, fig. 27.

Belongs to the *costalis* group; mesonotal præscutum dark cinnamon-brown; pleura almost uniformly dark brown, only the ventral pteropleurite restrictedly paler; legs with the femora obscure yellow, the tips weakly darkened; tibiæ dirty brown; tarsi snowy white; wings with the ground color rather strongly

infumed; cell M_1 subequal to or shorter than its petiole; male hypopygium with the median area of tergite produced into a low triangular point; eighth sternite with the median area slightly produced and provided with pale yellow setæ.

Male.—Length, about 8.5 to 9 millimeters; wing, 10 to 10.5.

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

Rostrum and palpi dark brown. Antennæ with the scape and pedicel light brown; first segment of flagellum obscure yellow, the outer segments dark brown; flagellar segments cylindrical, with short inconspicuous verticils. Head with the front and anterior vertex cinnamon-brown, the posterior vertex and occiput darker brown.

Mesonotal præscutum and scutum dark cinnamon-brown; scutellum and mediotergite a little darker brown. Pleura dark brown, only the ventral pteropleurite restrictedly paler. Halteres pale, the knobs dark brown. Legs with the fore and middle coxæ dark brown, the posterior coxæ more testaceous; trochanters yellow; femora obscure yellow, the tips weakly darkened; tibiæ dirty brown, the extreme base more whitened; tarsi snowy white (fore and hind legs broken). Wings (Plate 1, fig. 2) with the ground color rather strongly infumed; the usual dark costal pattern of the *costalis* group is present, the areas not margined by paler; cell R_3 with brown clouds on outer portion, including a band at two-thirds the length; cell Cu darkened; veins dark brown. Venation: Rs elongate and spurred, as in group; medial forks short, cell M_1 subequal to or shorter than its petiole; cell 2d A relatively wide.

Abdomen with basal segments chiefly obscure yellow, beyond the second chiefly dark brown, especially medially and at outer ends. Male hypopygium (Plate 2, fig. 27) with the median area of tergite, 9t, produced into a low triangular point. Eighth sternite, 8s, with the median area slightly produced and provided with pale yellow setæ, some of which are decussate at midline.

Habitat.—Central Celebes (Bontoe Batoe District).

Holotype, male, Latimodjong Mountains, altitude 5,800 feet, May 24, 1931 (*Clagg*). Allotopotype, female. Paratopotypes, 2 males.

The specific name is that of an aboriginal tribe of Celebes. The only allied species is *Dolichopeza* (*Nesopeza*) *borneensis* (Edwards), of North Borneo, which differs in the coloration of the wings and the uniformly pale thoracic pleura. This latter

species has Rs with a longer basal spur and lying closer to R₁ than is the case in the present fly.

DOLICHOPEZA (NESOPEZA) PROFUNDEMARGINATA sp. nov. Plate 1, fig. 3; Plate 2, fig. 28.

Belongs to the *costalis* group; most nearly allied to *geniculata*; basal segments of flagellum pale; pleura brown, the dorso-pleural region and pteropleurite whitish; male hypopygium with median area of tergite unequally trilobed, separated from the slender lateral arms by narrow incisions; eighth sternite long and sheathing, profoundly emarginate medially, each lateral lobe obtusely rounded.

Male.—Length, about 8 millimeters; wing, 9.2.

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

Rostrum dark brown; palpi brown, especially the outer segment. Antennæ with scape dark brown, pedicel a trifle paler; flagellum with basal segments white, the outer ones passing into pale brown; flagellar segments cylindrical, with verticils that are shorter than the segments. Head pale brown.

Mesonotum brown, the præscutal stripes scarcely demarked. Pleura brown, the dorsopleural region and pteropleurite whitish. Halteres white, the knobs dark brown. Legs with the coxæ dark brown, the posterior pair paler on basal portions; trochanters pale yellow; femora pale yellow, the tips broadly and conspicuously black, preceded by a narrow, more whitish ring; tibiæ dirty white, the tips narrowly blackened, preceded by a clearer ring; tarsi snowy white. Wings (Plate 1, fig. 3) with the ground color grayish, with the usual dark brown pattern of the group, the costal areas narrowly bordered behind by whitish; isolated white spots in outer ends of cells R₃ and R₅; small white spots at h and arculus; veins chiefly pale brown, the cord and elements lying in the dark markings brown. Venation: Basal spur of Rs elongate; forks of medial field short.

Abdominal tergites dark brown, the lateral portions of the second tergite restrictedly pale; succeeding tergites variegated beyond base with obscure yellow. Male hypopygium with the ninth tergite (Plate 2, fig. 28, 9t) having the median area protuberant, unequally trilobed, separated from the lateral portions by a notch; lateral arms relatively slender, with several small wartlike points. Eighth sternite, 8s, large and sheathing, profoundly emarginate medially, forming two short cylindrical lobes with blunt tips; at base of notch, on either side, with a small lobule; median region of sternite cephalad of base of emargination with pale membrane almost to border of sclerite.

Habitat.—Formosa (north).

Holotype, male, Urai, altitude about 1,500 feet, April 1, 1932 (*Gressitt*). Allotype, female, Giran, November 20, 1928 (*Issiki*).

Dolichopeza (Nesopeza) profundemarginata is very similar to *D. (N.) geniculata* Alexander (Japan) in all colorational features, differing notably in the structure of the male hypopygium, especially the long, sheathing sternite that is deeply emarginate.

DOLICHOPEZA (NESOPEZA) TORAJA sp. nov. Plate 1, fig. 4; Plate 2, fig. 29.

Belongs to the *gracilis* group; wings tinged with brown, the usual darkened pattern of the group very poorly defined and not extending distad beyond the stigma; male hypopygium with median region of tergite only slightly convex; eighth sternite unarmed.

Male.—Length, about 8 millimeters; wing, 8.8.

Rostrum and palpi dark brown. Antennæ with scape dark brown, the succeeding segments paler brown; flagellar segments long-cylindrical, clothed with a short dense white pubescence and with short inconspicuous verticils. Head dark brown.

Mesonotal præscutum brown, with three brownish black stripes, the median one elongate, the laterals abbreviated; scutal lobes variegated with dark brown; scutellum brownish black; mediotergite brown. Pleura distorted in the unique type, apparently almost uniform brown. Halteres elongate, black, the base of stem restrictedly pale. Legs with the coxæ brownish; trochanters paler; remainder of legs broken. Wings (Plate 1, fig. 4) with the ground color weakly tinged with brown; the usual dark costal pattern of the group is here only faintly differentiated from the ground color, being indicated by a darkening at base, the costal region and the stigma, with further very restricted clouds at origin of Rs, anterior cord, and end of vein Cu₁; no darkening beyond stigma; veins dark brown. Venation: Rs elongate, angulated and long-spurred near origin; medial forks relatively deep.

Abdominal tergites weakly bicolorous, the basal half or more brownish yellow; posterior ring dark brown or brownish black. Male hypopygium (Plate 2, fig. 29) with the median region of tergite, 9*t*, almost transverse or only feebly elevated, narrowly blackened; lateral lobes of tergite obtuse. Inner dististyle, *id*, with the apical beak slender. Eighth sternite, 8*s*, with the caudal margin very gently convex, without special armature of lobes or setæ.

Habitat.—Central Celebes (Bontoe Batoe District).

Holotype, male, Latimodjong Mountains, altitude 5,800 feet, May 24, 1931 (*Clagg*).

The specific name is that of an aboriginal tribe inhabiting central, southeastern, and eastern Celebes. *Dolichopeza* (*Nesopeza*) *toraja* is very distinct from all other members of the *gracilis* group in the slightly infumed wings and scarcely differentiated dark costal pattern.

LIMONIINÆ

LIMONIINI

LIMONIA (LIBNOTES) FALSA sp. nov. Plate 1, fig. 5; Plate 2, fig. 30.

Mesonotal præscutum shiny reddish, the posterior sclerites of mesonotum and the pleura variegated with dark brown or brownish black; antennæ black throughout, the flagellar segments with long verticils; halteres yellow, knobs brownish black; wings whitish subhyaline, prearcular region yellow; costal border of wings dark brown; free tip of Sc_2 lying far before level of R_2 ; m-cu opposite midlength of cell 1st M_2 ; anal veins convergent; abdominal tergites brownish black medially, pale laterally; male hypopygium with the rostral prolongation long and slender, with two small spines at base.

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

Rostrum and palpi black. Antennæ black throughout; flagellar segments long-oval, with elongate verticils that considerably exceed the segments. Head dark gray, the front and very narrow anterior vertex silvery.

Pronotum dark brown above, more yellowish on sides. Mesonotal præscutum shiny red, unmarked; scutum dark brown, the centers of the lobes more castaneous; scutellum testaceous-brown; mediotergite dark brown. Pleura with the propleura and ventral sternopleurite more yellowish; dorsal sternopleurite, anepisternum, and posterior pleural sclerites darker brown. Halteres yellow, the knobs brownish black. Legs with the coxæ and trochanters yellow; femora yellow basally, at near midlength becoming darker, at tips passing into brownish black; tibiæ brownish yellow, the tips narrowly darker; tarsi brownish yellow, the outer segments darker. Wings (Plate 1, fig. 5) whitish subhyaline; prearcular region light yellow; costal border, including cells C and Sc , dark brown, the color continued outward to wing tip; stigma very small, still darker brown; brown seams along vein Cu_1 , on m-cu and in axillary region; veins dark brown,

luteous in the prearcular field. Macrotrichia of veins long and conspicuous. Venation: Sc_2 ending about opposite midlength of cell 1st M_2 , Sc_2 longer than Sc_1 ; Rs elongate; free tip of Sc_2 far before level of R_2 ; R_1 with numerous trichia; R_{1+2} jutting beyond R_1 as a slight spur or thickening; outer radial veins moderately decurved at tips; m-cu at midlength of cell 1st M_2 ; vein 2d A converging strongly toward 1st A.

Abdominal tergites yellow, brownish black medially, forming a continuous median stripe that is a little expanded at the posterior borders of the segments; sternites yellow, segments eight and nine brownish black, the styli pale. Male hypopygium (Plate 2, fig. 30) with the tergite, 9t, broadly transverse, the caudal border convex. Ventral dististyle, *vd*, smaller in area than the basistyle; rostral prolongation long and slender, with two rostral spines close to its base; a pale lobe on face of style opposite base of prolongation (not shown in figure). Mesal-apical lobe of gonapophysis slender. *Ædeagus*, *a*, very broad.

Habitat.—Central Celebes (Bontoe Batoe District).

Holotype, male, Latimodjong Mountains, altitude 5,800 feet, May 24, 1931 (*Clagg*).

Despite its small size and the unusual pattern of the wings, the present fly belongs to the typical section of the subgenus, having convergent anal veins and a hypopygium of the general structure of this group of species. In Edwards's key to the species of *Libnotes*² the fly runs to couplet 28, disagreeing with all species beyond by the wing pattern and venation of the radial field, especially the position of the free tip of Sc_2 some distance proximal of R_2 .

LIMONIA (LIBNOTES) COMISSABUNDA sp. nov. Plate 1, fig. 6.

General coloration of mesonotum buffy, the præscutum vaguely lined with darker; antennæ black; femora yellow, with a brown subterminal ring; wings whitish subhyaline, with a restricted brown pattern, including seams along cord and outer end of cell 1st M_2 ; vein R_{2+3} strongly arcuated at proximal end; cell 1st M_2 elongate, widened at outer end, m-cu at near one-third its length; m gently arcuated, about twice the basal section of M_3 ; anal veins convergent at bases; ovipositor with cerci bidentate at tips.

Female.—Length, about 10 millimeters; wing, 12.

Rostrum and palpi brownish black. Antennæ brownish black; flagellar segments oval, the longest verticils about twice the seg-

² Journ. Fed. Malay St. Mus. 14 (1928) 74-80.

ments. Front and anterior vertex light golden yellow; posterior vertex grayish brown, the central portion more fulvous, with a further capillary dark line.

Pronotum buffy on sides and as a mid-dorsal vitta, the remainder of dorsum dark brown. Mesonotum buffy, vaguely lined with darker, including a pair of intermediate brown stripes; posterior sclerites of notum sparsely pruinose, the centers of the scutal lobes darker. Pleura pale, the propleura and ventral anepisternum weakly darkened. Halteres elongate, yellow, the knobs dark brown basally, the apices a little brightened. Legs with the fore coxæ a trifle darker than the others, middle and posterior coxæ yellow; trochanters yellow; femora yellow with a brown subterminal ring at about its own width before the tip; tibiæ light brown, the tips narrowly darkened, the outer tarsal segments darkened. Wings (Plate 1, fig. 6) whitish subhyaline, the prearcular and costal regions more yellow; a restricted brown pattern, appearing as seams to certain of the veins, including the cord and outer end of cell 1st M_2 ; basal half of R_{2+3} and adjoining portions of outer end of vein Sc; narrow stigmal area; outer third of 2d A; less distinct clouds at arculus and in axillary region; veins yellow, dark brown in the clouded areas. Venation: Sc long, Sc_1 ending beyond m-cu, Sc_2 at its tip; Rs gently arcuated; R_{2+3} strongly arcuated at proximal end, constricting cell R_1 at near one-third the length; R_3 decurved at outer end; free tip of Sc_2 and R_2 in approximate transverse alignment; cell 1st M_2 elongate, widened at outer end; m gently arcuated, about twice the basal section of M_3 ; m-cu at just before one-third the length of cell 1st M_2 ; anal veins convergent at bases.

Abdominal tergites variegated with dark brown and obscure yellow, the ground color dark, the caudal borders more yellow; sternites with the pattern similar but less contrasted. Ovipositor with the cerci bidentate at tips.

Habitat.—Formosa (north).

Holotype, female, Taiheizan, May 6, 1932 (*Gressit*).

In Edwards's key to the species of *Libnotes*³ the present fly runs to *Limonia* (*Libnotes*) *nohirai* (Alexander), which differs notably in the broadly blackened tips of the femora and in the details of venation. In its general appearance the species also suggests species such as *L. (L.) amatrix* (Alexander), but differs

³ Loc. cit.

conspicuously in the pattern of the legs and wings, and in the venation.

LIMONIA (LIMONIA) ALOPECURA sp. nov. Plate 1, fig. 7; Plate 2, fig. 31.

Belongs to the *pendleburyi* group; coloration almost uniformly pale testaceous-brown to reddish brown; antennæ relatively long; wings whitish subhyaline, the stigma conspicuous, dark brown; cell 1st M_2 large, exceeding the veins beyond it; male hypopygium unusually complex in structure, the basistyle bearing three distinct lobes and outgrowths on mesal face.

Male.—Length, about 5 millimeters; wing, 6.

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

Rostrum and palpi brown. Antennæ relatively long; scape and pedicel dark brown, flagellum paler, testaceous-brown; flagellum moniliform, the segments strongly constricted at outer ends into short pedicels; terminal segment longer than the penultimate, strongly pointed at outer end; flagellar segments with abundant pale setæ. Head dark gray.

Mesonotum and pleura almost uniformly pale testaceous-brown to reddish brown. Halteres pale, the knobs weakly darkened. Legs with the coxæ and trochanters testaceous-yellow; femora whitish, the tips narrowly darkened; tibiæ and basitarsi dirty white, the tips narrowly darkened; outer tarsal segments darkened. Wings (Plate 1, fig. 7) whitish subhyaline, the oval stigma conspicuous, dark brown; veins yellow, beyond the cord more brownish yellow. Venation: Sc_1 ending shortly beyond midlength of R_s , Sc_2 at its tip; free tip of Sc_2 and R_2 in approximate transverse alignment, or the latter a little more basad; cell 1st M_2 large, exceeding the veins beyond it; m-cu shortly beyond fork of M , subequal to the distal section of Cu_1 .

Abdominal tergites brown, the sternites yellow. Male hypopygium (Plate 2, fig. 31) with the caudal border of the long tergite, $9t$, convexly rounded. Basistyle, b , with the mesal armature consisting of three complex lobes; namely, first, a short flattened blade that terminates in a comblike series of acute spines; second, a dusky blade, the base narrow, the apex expanded, obliquely truncate, with long coarse setæ; third, a slender-based spatulate lobe, the dilated head with recurved delicate setæ. Dististyle, d , complicated by lobes and outgrowths, the most conspicuous element being a broadly flattened spatula that is densely clothed with long setæ. Gonapophyses, g , with the outer margin corrugated as in group.

Habitat.—Central Celebes (Bontoe Batoe District).

Holotype, male, Latimodjong Mountains, altitude 4,500 to 6,000 feet, May 25, 1931 (*Clagg*.) Allotype, female, altitude 5,800 feet, May 24, 1931 (*Clagg*).

Limonia (*Limonia*) *alopecura* resembles other species of the *pendleburyi* group in its general appearance but is very different in the unusually complicated male hypopygium, especially the basistyle.

LIMONIA (LIMONIA) INSCITA sp. nov. Plate 1, fig. 8; Plate 2, fig. 32.

General coloration of mesonotum brownish yellow to testaceous-yellow; knobs of halteres dark brown; wings with a faint brown tinge; stigma oval, a trifle darker than the ground; Sc_1 ending about opposite two-fifths the length of R_s , Sc_2 at its tip; R_s angulated and weakly spurred at origin; male hypopygium with the dorsal dististyle microscopically setulose; ventral dististyle relatively small, the rostral prolongation with two spines, the innermost from an enlarged basal tubercle.

Male.—Length, about 4 millimeters; wing, 4.8.

Rostrum obscure yellow; palpi brownish black. Antennæ with the basal segments damaged; flagellum black; flagellar segments oval. Head dark gray.

Pronotum yellowish testaceous, with long erect black setæ. Mesonotum gibbous, brownish yellow to brownish testaceous. Pleura testaceous-yellow. Halteres with the stem pale, the base yellow, the knob dark brown. Legs with the coxæ and trochanters yellow; femora testaceous-brown, the outer segments of the tarsi slightly darker. Wings (Plate 1, fig. 8) with a very faint brown tinge; stigma oval, a trifle darker brown; veins brown. Venation: Sc of moderate length, Sc_1 ending about opposite two-fifths the length of R_s , Sc_2 at its tip; R_s angulated and weakly spurred at origin; free tip of Sc_2 and R_2 in alignment; $m-cu$ oblique, just before the fork of M , subequal to the distal section of Cu_1 ; anal veins parallel at origin.

Abdomen dark brown; hypopygium pale. Male hypopygium (Plate 2, fig. 32) with the caudal margin of the tergite, $9t$, strongly notched medially. Basistyle, b , relatively small, the mesal lobe large. Dorsal dististyle, dd , with the surface on basal two-thirds with microscopic setulæ. Ventral dististyle, vd , subequal in area to the basistyle; prolongation with two strong spines of equal length, placed close together on basal third of prolongation; inner spine from a more strongly de-

veloped tubercle than the outer spine. Gonapophyses, *g*, with the mesal-apical lobe curved, blackened.

Habitat.—Formosa (north).

Holotype, male, Urai, altitude about 1,500 feet, May 1, 1932 (*Gressitt*).

Limonia (Limonia) inscita is very different from other known species of the subgenus, as now known from the Japanese Empire. The type of hypopygium is somewhat as in *L. (L.) fusca* (Meigen), which is otherwise very different in the apically pubescent wings.

LIMONIA (EUGLOCHINA) CURTATA sp. nov. Plate 1, fig. 9.

General coloration of mesonotum shiny brown, the pleura more yellow; wings whitish subhyaline, the cells beyond cord weakly darkened; stigma oval, dark brown; Sc very short, the distance between arculus and tip of Sc₁ being shorter than the distance on R between Sc₂ and origin of Rs; Rs short, oblique; R₁ beyond Rs without further union with R₂₊₃; cell M₂ open by the atrophy of the basal section of M₃; m-cu nearly its own length beyond fork of M; vein 2d A ending distinctly beyond level of vein Sc.

Female.—Length, about 5.5 millimeters; wing, 5.8.

Rostrum and palpi brownish black. Antennæ with scape and pedicel brownish black; flagellum dark brown; antennæ relatively elongate; flagellar segments fusiform. Head brown.

Mesonotum almost uniform shiny brown, the pleura more yellowish. Halteres elongate, the stem brown, the knob brownish black. Legs with the coxæ yellow; trochanters testaceous; remainder of legs broken. Wings (Plate 1, fig. 9) whitish subhyaline, the cells beyond cord, together with the apical border, a trifle darker; stigma oval, dark brown; veins dark brown. Macrotrichia of veins long and conspicuous. Venation: Sc very short, the vein between arculus and its tip shorter than the distance on R between Sc₂ and origin of Rs; Rs very short, oblique, subequal in length to r-m, and with vein R₁ beyond it simple, without connection with R₂₊₃; basal section of R₄₊₅ long and strongly arcuated; cell M₂ open by atrophy of basal section of vein M₃; m-cu nearly its own length beyond fork of M; vein 2d A ending distinctly beyond the level of end of vein Sc.

Abdomen with the segments brown, the basal portion a little brightened.

Habitat.—Central Celebes (Bontoe Batoe District).

Holotype, female, Latimodjong Mountains, altitude 5,800 feet, May 24, 1931 (Clagg).

Limonia (Euglochina) curtata is very different from the other described species of *Euglochina* in the whitish subhyaline wings, the very short Sc, short Rs, entire atrophy of vein R₂, and the open cell M₂. All other described species of the subgenus have Sc longer, always exceeding the distance between Sc₂ and origin of Rs; Rs much longer than r-m; R₂ present, connecting R₁₊₂ with R₃; and with cell 1st M₂ closed.

HELIUS (HELIUS) COPIOSUS sp. nov. Plate 1, fig. 10; Plate 2, fig. 33.

General coloration of mesonotum dark brown; antennæ relatively long, dark brown throughout; flagellar segments cylindrical, with abundant, dense, erect setæ that are almost as long as the short verticils; wings pale yellowish subhyaline; stigma long-oval, pale brown; Sc₁ ending opposite fork of Rs; cell 1st M₂ short-hexagonal, with m-cu at midlength.

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

Rostrum relatively long and slender, a little longer than the remainder of head, dark brown; palpi black. Antennæ relatively elongate, dark brown throughout; flagellar segments cylindrical, with abundant dense erect setæ that are almost as long as the short verticils. Head blackish, sparsely pruinose.

Mesonotum chiefly dark brown, the scutellum more testaceous. Pleura more reddish brown. Halteres yellow, the knobs weakly darkened. Legs with the fore coxæ darkened, the remaining coxæ and all trochanters yellow; femora and tibiæ pale brown, the tarsi passing into light yellow. Wings (Plate 1, fig. 10) pale yellowish subhyaline, the prearcular and costal regions a little brighter; stigma long-oval, pale brown; veins pale brown, more yellowish in the costal region. Anterior branch of Rs with relatively few macrotrichia, including about six or seven, widely scattered; other outer radial and medial veins with close, dense series of trichia; costal fringe of moderate length and very dense. Venation: Sc₁ terminating opposite fork of Rs; cell R₂ at margin narrow, subequal to m-cu; cell 1st M₂ short-hexagonal; veins issuing from cell 1st M₂ elongate; m-cu at midlength of the cell.

Abdomen dark brown; hypopygium yellow. Male hypopygium (Plate 2, fig. 33) with the basistyle, *b*, produced into a lobe on base of mesal face. Outer dististyle, *od*, short, blackened,

gently arcuated, the tip very weakly bidentate. What are presumably interbases, *i*, have the peculiar conformation shown in the figure. *Ædeagus*, *a*, weakly spiraliform at tip.

Habitat.—Central Celebes (Bontoe Batoe District).

Holotype, male, Latimodjong Mountains, altitude 5,800 feet, May 24, 1931 (*Clagg*).

By Edwards's synopsis of the Oriental species of *Helius*⁴ the present fly runs to *Helius* (*Helius*) *kambangani* (de Meijere) and *H.* (*H.*) *fasciventris* Edwards, but differs from both in the body coloration and venation. In the two latter species, *Sc* is unusually long, extending almost to opposite the outer end of cell 1st M_2 , which latter is of peculiar shape, with *m* oblique in position and longer than the basal section of M_3 .

ORIMARGA (ORIMARGA) GYMNONEURA sp. nov. Plate 1, fig. 11; Plate 2, fig. 34.

General coloration dark gray; legs and antennæ black; wings grayish, very broad; wing veins unusually glabrous, there being no trichia on *Rs* or any of its branches; R_{2+3} about twice as long as R_2 , the latter longer than R_{1+2} ; male hypopygium with the outer dististyle broader and less acutely pointed than usual in the genus; inner dististyle near apex bent almost at a right angle into a slender lobe; gonapophyses and interbases appearing as slender acute spines.

Male.—Length, about 5 millimeters; wing, 5 by 1.6.

Rostrum brown; palpi black. Antennæ black throughout; flagellar segments oval. Head gray.

Mesonotum almost uniformly dark gray, the posterior sclerites more dusted with lighter gray. Pleura dark gray; dorso-pleural region dark. Halteres pale, the knobs slightly dusky. Legs with the coxæ reddish, sparsely pruinose; trochanters brownish testaceous; remainder of legs brownish black. Wings (Plate 1, fig. 11) grayish, the prearcular and costal regions a trifle brighter; veins dark brown. Wings very broad, as shown by the measurements; macrotrichia of veins unusually sparse, there being none on any of the veins beyond level of fork of *Rs*, excepting two or three near outer ends of each of veins M_{1+2} and M_3 ; none on *Rs* or its branches. Venation: Sc_1 ending shortly before fork of *Rs*, Sc_2 at its tip; R_{2+3} about twice R_2 , the latter longer than R_{1+2} ; *r-m* lying slightly beyond level of R_2 ; *m-cu* opposite midlength of *Rs*; cell 2d A long-extended, its outer end opposite or shortly beyond *m-cu*.

⁴Journ. Fed. Malay St. Mus. 14 (1928) 85–86.

Abdomen dark reddish brown, the sternites a little brighter; hypopygium a little brighter. Male hypopygium (Plate 2, fig. 34) with the outer dististyle, *od*, much broader and less acutely pointed than is usual in the genus; inner dististyle, *id*, near apex bent almost at a right angle into a slender lobe. Gonapophyses, *g*, and interbases, *i*, appearing as slender acute spines, the tips narrowly pale.

Habitat.—Formosa (south).

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

The unusually glabrous veins and the very broad wings will readily separate the present fly from all other species of *Orimarga* in eastern Asia.

ORIMARGA (ORIMARGA) GRISEIPENNIS sp. nov. Plate 1, fig. 12.

General coloration of notum dark brown, grayish pruinose; rostrum obscure yellow; antennæ black throughout; legs black; wings grayish; macrotrichia on veins beyond cord relatively numerous; R_{2+3} fully one-half longer than R_2 ; petiole of cell M_3 relatively long, exceeding vein M_4 ; basal portion of vein M_3 distinctly preserved; m-cu nearly opposite midlength of Rs; abdomen reddish brown.

Female.—Length, about 5 millimeters; wing, 4.4.

Rostrum obscure yellow; palpi black. Antennæ black throughout; flagellar segments oval; verticils inconspicuous. Head dark gray.

Mesonotal præscutum and scutum dark brown, sparsely pruinose; scutellum reddish, very sparsely pruinose; mediotergite light gray. Pleura almost uniformly reddish yellow. Halteres pale, the base of stem yellow, the knobs weakly dusky. Legs with the coxæ reddish; trochanters more testaceous; remainder of legs black, the femoral bases restrictedly or scarcely brightened. Wings (Plate 1, fig. 12) grayish, the prearcular and costal regions more yellowish white; veins brown, slightly seamed with brown to produce a slight streaked appearance. Macrotrichia of veins beyond cord relatively abundant, there being close series on all of R_3 except the basal fourth; all of outer section of R_{4+5} , and on basal section of the latter except for the slightly deflected basal portion; on outer section of M_{1+2} except the basal fifth; on entire lengths of veins M_3 and M_4 . Venation: Sc_1 ending beyond midlength of Rs, Sc_2 at its tip; no trace of the free tip of Sc_2 ; R_{2+3} about one-half longer than R_2 , the latter a little shorter than R_{1+2} ; petiole of cell M_3 long,

exceeding vein M_4 in length; base of vein M_3 distinctly preserved; m-cu with its cephalic end nearly opposite mid-length of Rs.

Abdomen reddish brown throughout.

Habitat.—Formosa (south).

Holotype, female, Tyusinron, altitude 3,200 feet, August 18, 1933 (*Issiki*).

The nearest ally seems to be *Orimarga (Orimarga) taiwanensis* Alexander, which differs most evidently in the more brownish yellow wings, with the venational detail different, especially the position of m-cu and the short petiole of cell M_3 .

ORIMARGA (ORIMARGA) TOALA sp. nov. Plate 1, fig. 13.

General coloration of thorax dark plumbeous gray; rostrum, palpi, and antennæ black; wings tinged with gray; macrotrichia of veins very sparse, quite lacking on veins R_{1+2} , R_2 , R_{2+3} , and R_3 ; R_{1+2} very short, not exceeding one-half R_2 ; r-m and basal section of M_{1+2} in transverse alignment; cell M_3 about one-half longer than its petiole; abdomen brownish black.

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

Rostrum black, paler ventrally; palpi black. Antennæ black throughout; flagellar segments suboval, with dense pubescence. Head plumbeous gray.

Mesonotum uniformly dark plumbeous gray. Pleura gray, the ventral pleurites a little more reddish. Halteres pale, the knobs weakly dusky. Legs with the fore coxæ dark gray, the remaining coxæ testaceous gray; trochanters testaceous yellow; remainder of legs more yellowish brown, especially the tarsi. Wings (Plate 1, fig. 13) tinged with grayish; veins pale brown. Macrotrichia of veins very sparse, there being none on Rs, R_{1+2} , R_2 , R_{2+3} , or R_3 ; on R_{4+5} , with a series of about fifteen on distal half of outer section; a restricted series on outer ends of veins M_{1+2} and M_3 . Venation: Sc_1 ends about opposite five-sixths the length of Rs, Sc_2 a short distance from its tip; R_{1+2} very short, not exceeding one-half R_2 ; basal section of R_{4+5} strongly angulated on basal third; r-m and basal section of M_{1+2} in transverse alignment; cell M_3 about one-half longer than its petiole; m-cu opposite the basal third of Rs.

Abdomen brownish black, the sternites a trifle paler.

Habitat.—Central Celebes (Bontoe Batoe District).

Holotype, female, Latimodjong Mountains, altitude 3,800 feet, May 15, 1931 (*Clagg*). Paratopotype, female.

Orimarga (Orimarga) toala is named after a tribe of aborigines inhabiting Celebes. Its nearest ally appears to be *O. (O.)*

borneensis Brunetti, with which it agrees in the general appearance and venation, as the very short R_{1+2} . The latter species is well-distinguished from *toala* by details of venation, as the elongate Rs and the arcuated basal section of M_{1+2} , which is much longer than r-m and not in alignment with it; and by the more abundant and conspicuous macrotrichia of the radial veins, including a series of about fifteen distributed over almost the whole length of vein R_3 .

ORIMARGA (ORIMARGA) HYPOPYGIALIS sp. nov. Plate 1, fig. 14; Plate 2, fig. 35.

General coloration brownish gray, the præscutum more blackened medially; wings with a faint brown tinge; macrotrichia of outer radial and medial veins dense and abundant; Rs short and angulated at origin; R_{1+2} long, approximately three times R_2 and nearly as long as R_{2+3} ; cell M_3 deep; male hypopygium with the tergite conspicuous, deeply emarginate, the lobes broadly rounded and without specially modified setæ; lobe of basistyle tapering to a narrow point, with numerous fasciculate setæ.

Male.—Length, about 5 millimeters; wing, 6.

Rostrum and palpi black. Antennæ black throughout. Head dark gray, the anterior vertex somewhat brighter.

Mesonotal præscutum brownish gray, the median stripe blackish, somewhat polished; lateral stripes poorly indicated; posterior sclerites of notum gray. Pleura blackish, sparsely pruinose. Halteres pale. Legs with the coxæ brownish black, the fore coxæ somewhat darker; trochanters brownish black; remainder of legs dark brown or brownish black. Wings (Plate 1, fig. 14) with a faint brown tinge; veins brown. Macrotrichia of veins relatively abundant, including a series of about twelve on R_{1+2} and more than fifty on R_3 alone; complete dense series of trichia on all outer branches of R and M. Venation: Rs short and angulated near origin; R_{1+2} long, approximately three times R_2 and nearly as long as R_{2+3} ; cell M_3 deep, M_{3+4} being about two-thirds M_4 ; m-cu just beyond the level of the bend of Rs.

Abdomen, including hypopygium, dark brown. Male hypopygium (Plate 2, fig. 35) of the general type of *quadrilobata*, differing especially in the broad lobes of the tergite, 9t, which are evenly rounded and without a group of specially modified setæ on their internal margin, and in the narrow lobe of the basistyle, b. Both species have the dististyles of approximately

the same conformation and with the abundant setæ of the lobe of the basistyle strongly fasciculate.

Habitat.—Central Celebes (Bontoe Batoe District).

Holotype, male, Latimodjong Mountains, altitude 5,800 feet, May 24, 1931 (*Clagg*).

The closest ally of the present fly is undoubtedly *Orimarga* (*Orimarga*) *quadrilobata* Alexander (Mindanao), which differs in the venation, especially the short R_{1+2} , and in the details of the structure of the male hypopygium, as the conformation of the tergite and lobe of the basistyle. *Orimarga* (*O.*) *fryeri* Edwards (Seychelles Islands) and *O.* (*O.*) *flaviventris* Edwards (Key Islands) likewise have hair brushes on the basistyle of the hypopygium but are otherwise very different flies.

HEXATOMINI

EPIPHRAGMA (POLYPHRAGMA) MINAHASSANA sp. nov. Plate 1, fig. 15; Plate 3, fig. 36.

Belongs to the *ochrinota* group; mesonotum reddish brown, the surface very sparsely pruinose; pleura brownish black; darkened femoral ring pale brown; wings with a brown pattern that is narrowly bordered by yellow; male hypopygium with the interbase a simple rod, on outer fifth angularly bent to an acute point.

Male.—Length, about 7.5 millimeters; wing, 8.3.

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

Rostrum and palpi brownish black. Antennæ with the scape brown, sparsely pruinose; pedicel and first two flagellar segments light orange-yellow; outer flagellar segments brown. Front and anterior vertex ashy gray; posterior vertex dark brown on central area, the lateral and orbital portions more fulvous.

Mesonotal præscutum and scutum reddish brown, the surface very sparsely pruinose; scutellum and mediotergite dark brown, sparsely pruinose. Pleura brownish black, immaculate, contrasting abruptly with the pale notum. Halteres with the stem yellow, narrowly darkened at extreme base, the knob infuscated. Legs with the fore and middle coxæ brownish yellow; posterior coxæ blackened; trochanters yellow; femora yellow, darkened to a pale brown subterminal ring, the tip again light yellow; tibiæ and tarsi yellow. Wings (Plate 1, fig. 15) with the ground color pale brown, variegated by darker brown spots and broken crossbands that are narrowly bordered by pale yellow; prearcular and costal regions yellow; cell C with about ten dark areas, some of which inclose spurs of crossveins; longitudinal veins at margin with brown spots, the ends of the correspond-

ing cells with yellow areas, more intense in the radial field; veins brown, more luteous in the costal field. Venation: R_{2+3+4} shorter than m-cu, the latter about one-half its length beyond the fork of M.

Abdomen dark brown, in male with intermediate portions of the sternites a little more yellowish. Male hypopygium (Plate 3, fig. 36) with the lobes of the tergite, 9t, slender, separated by a U-shaped notch. Dististyles, *id*, *od*, relatively small. Interbase, *i*, a long, powerful, simple rod, on outer fifth bent at an angle to the acute point.

Habitat.—North Celebes (Minahassa).

Holotype, male, Roeroekan, altitude 4,000 feet, April 18, 1931 (*Clagg*). Allotopotype, female. Paratopotype, female.

In my key to the species of *Polyphragma*⁵ the present fly runs to *Epiphragma* (*Polyphragma*) *ochrinota* Alexander (Luzon), which is its nearest ally. The fly is most readily told by the hypopygial structures, especially of the tergite and interbase. The subgenus had previously been recorded only from Luzon, Mindanao, and Borneo.

LIMNOPHILA (TRICHOLIMNOPHILA) FEROCIA sp. nov. Plate 1, fig. 16; Plate 3, fig. 37.

General coloration of mesonotum opaque grayish brown, the præscutum without evident stripes; antennæ (male) elongate; femora obscure yellow; wings strongly tinged with brown, the base unbrightened; restricted darker brown seams at origin of R_s and along cord and outer end of cell 1st M_2 ; abdominal tergites dark brown, sternites brownish yellow; male hypopygium with the median lobe of tergite long and narrow, parallel-sided, the apex truncated; outer dististyle without spinous points on surface; phallosome with the gonapophyses simple, each appearing as a flattened, twisted blade that exceeds the ædeagus in length.

Male.—Length, about 5 millimeters; wing, 5.5 to 5.6; antenna, about 2.7.

Rostrum brownish black; palpi black. Antennæ (male) relatively elongate, as shown by the measurements, the individual segments a little longer than in *platystyla*; scape and pedicel brownish yellow; flagellum black, the extreme base of the first segment restrictedly pale; flagellar segments with verticils that are subequal in length to the segments. Head grayish brown.

⁵ Philip. Journ. Sci. 49 (1932) 259–261.

Mesonotum opaque grayish brown, without evident stripes. Pleura dark grayish brown. Halteres with stem yellow, the knob dusky. Legs with fore coxæ brown, the remaining coxæ and all trochanters light yellow; femora obscure yellow; tibiæ brownish yellow, the tips narrowly dark brown; tarsi brownish black. Wings (Plate 1, fig. 16) strongly tinged with brown, the color uniform throughout except for darker brown areas at origin of R_s , Sc_2 , stigma, cord, and outer end of cell 1st M_2 ; veins brown, somewhat darker in the infuscated areas. Macrotrichia in outer ends of cells R_2 to M_4 , inclusive, more numerous in outer ends of the cells. Venation: Sc_1 longer than m-cu; R_2 pale but distinct, about one-half R_{1+2} ; petiole of cell M_1 approximately one-half the cell; m-cu about one-third its length beyond the fork of M .

Abdominal tergites dark brown; sternite brownish yellow. Male hypopygium (Plate 3, fig. 37) with the median lobe of tergite, $9t$, long and narrow, the sides nearly parallel, the lateral portions more deflexed; from each outer lateral angle with a strong ridge directed cephalad. Apex of basistyle, b , narrowed into a glabrous subacute point. Outer dististyle, od , strongly flattened, as in *platystyla*, the surface much wrinkled but without spinous points, as in *platystyla* and its variety *parallela*. Inner dististyle, id , with the inner or cephalic lobe very small and weak. Phallosome with the gonapophyses, g , simple, each appearing as a flattened, twisted blade that is longer than the ædeagus, a .

Habitat.—Formosa (north).

Holotype, male, Sozan, altitude 1,000 feet, December 5, 1933 (*Issiki*). Paratopotypes, 2 males.

Limnophila (*Tricholimnophila*) *ferocia* is allied to *L. (T.) platystyla* Alexander and its race, *L. (T.) platystyla parallela* Alexander, likewise from Formosa, differing most evidently in the distinct structure of the male hypopygium, especially the glabrous outer dististyle, and the simple, very large and conspicuous gonapophyses. In the two forms listed, the latter structure is a profoundly bifid rod, the arms appearing as slender spines. The male sex of *L. (T.) excelsa* Alexander, from the high mountains of Formosa, is still unknown, but from the coloration it cannot be identical with the present fly.

ELEPHANTOMYIA (ELEPHANTOMYODES) INFUMOSA sp. nov. Plate 1, fig. 17.

General coloration of mesonotum dull brownish orange to reddish brown; head dark brown or brownish black; legs dark

brown, the tarsi extensively snowy white; wings strongly suffused with brown but otherwise unmarked except for the darker stigmal area; abdomen feebly bicolorous.

Male.—Length, excluding rostrum, about 6 to 7 millimeters; wing, 6.5 to 7.5; rostrum, about 4.5 to 5.5.

Female.—Length, excluding rostrum, about 6 millimeters; wing, 5.5; rostrum, about 3.5.

Rostrum dark brown, longer in male. Antennæ black throughout. Head dark brown to brownish black, the inner orbits very narrowly grayish.

Mesonotal præscutum dull brownish orange to reddish brown, in female narrowly darker brown on the median area; scutum and scutellum dull brownish orange, the mediotergite somewhat darker brown. Pleura dull brown. Halteres brownish black, the base of stem restrictedly paler, the knob more blackened. Legs with the coxæ brown; trochanters obscure yellow; femora and tibiæ dark brown; basitarsi chiefly dark brown, the narrow tips and all of segments two and three snowy white; outer tarsal segments darkened. Wings (Plate 1, fig. 17) uniformly suffused with brown but otherwise unmarked except for the darker stigmal area; veins brownish black. Venation: m-cu at from one-third to one-half the length of cell 1st M_2 ; vein 2d A relatively long, ending at midlength of wing.

Abdomen feebly bicolorous, the tergites dark brown, the basal rings of segments three to five narrowly yellow; sternites more diffusely patterned; outer abdominal segments and hypopygium brownish black.

Habitat.—Northern Celebes (Minahassa).

Holotype, male, Mount Rumengan, Roeroekan, altitude 4,000 feet, April 13, 1931 (*Clagg*); mating on leaf of *Pandanus*. Allotopotype, female, in copula with type. Paratopotypes, 2 males.

In its combination of brownish black head, white tarsi, and unpatterned wings, the present fly is most nearly allied to *Elephantomyia* (*Elephantomyodes*) *nigriceps* Edwards (Siam, Borneo), *E. (E.) nigriclava* Edwards (Borneo), and *E. (E.) samarensis* Alexander (Philippines), differing from all in the strongly suffused wings.

ERIOPTERINI

TRENTEPOHLIA (TRENTEPOHLIA) PROBA sp. nov. Plate 1, fig. 18.

General coloration brownish black; humeral region of præscutum a little more reddish brown; knobs of halteres brownish black; wings with the ground color whitish, cross-banded with

dark brown; pale band beyond cord almost parallel-sided, only slightly constricted at midlength; no pale spots in outer ends of cells R, M, and Cu; Rs shorter than R_{2+3+4} ; R_2 subequal to R_{3+4} ; m-cu just beyond fork of M.

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

Rostrum black; palpi brown. Antennæ with the scape black, pedicel dark brown; flagellum broken. Head brownish black; vertex narrowed at a single point.

Pronotum and cervical sclerites black. Mesonotum dull brownish black, the humeral region of præscutum a little more reddish brown. Pleura brownish black, including the dorsopleural region. Halteres yellow, the knobs brownish black. Legs with the coxæ brownish black; trochanters obscure brownish yellow; remainder of legs broken. Wings (Plate 1, fig. 18) with the ground color whitish, cross-banded with dark brown; prearcular region and costal interspaces pale yellow; band of the ground color lying beyond cord almost parallel-sided and thus only slightly constricted along vein R_{4+5} and M_{1+2} ; darkened apex variegated by a white spot in outer ends of cells R_3 and R_4 ; grayish washes in base of cell R_5 and outer end of cell M_2 ; outer ends of cells in medial dark band not variegated by pale spots, as in *pulchripennis*; veins brown, pale yellow in the clear areas. Venation: Sc_1 ending beyond fork of M; Rs shorter than R_{2+3+4} ; R_2 subequal to R_{3+4} ; veins R_3 and R_4 only slightly divergent, the former rather strongly upcurved at costa; m-cu just beyond fork of M.

Abdomen black; ovipositor and genital segment orange.

Habitat.—Formosa (north).

Holotype, female, Urai, altitude about 1,500 feet, May 1, 1932 (Gressitt).

Trentepohlia (*Trentepohlia*) *proba* is most nearly allied to *T. (T.) pulchripennis* Alexander (Formosa), which differs especially in the smaller size, light yellow to brownish yellow mesonotum, yellowish sternum and dorsopleural region, and the distinct venation, especially the long R_{3+4} which is subequal to the nearly erect R_3 , and the distal position of the fork of M, with m-cu lying more than one-half its length before this fork.

GONOMYIA (LIPOPHLEPS) MITOPHORA sp. nov. Plate 1, fig. 19; Plate 3, fig. 38.

Belongs to the *skusei* group; mesonotal præscutum with three black or brownish black stripes that are confluent or nearly so; pleura reddish yellow to testaceous-yellow; legs dark brown; wings with a faint brown tinge; Sc relatively short for a mem-

ber of the group, Sc_1 ending shortly beyond origin of R_s ; male hypopygium with the outer lobe of basistyle unusually long, cylindrical; dististyles of the two sides slightly asymmetrical.

Male.—Length, about 4.5 to 5 millimeters; wing, 4.5 to 5.

Female.—Length, about 5.5 to 6 millimeters; wing, 5 to 5.3.

Rostrum and palpi black. Antennæ black throughout; flagellar segments (male) with elongate verticils, as in the group. Head dark.

Pronotum darkened medially, yellow on sides. Mesonotal præscutum chiefly covered by black or brownish black stripes that are nearly or quite confluent, reducing or obliterating the usual interspaces; scutal lobes almost covered by black areas, the broad median region and the scutellum pale yellow; mediotergite reddish yellow. Pleura uniformly reddish yellow to testaceous-yellow, without distinct stripes. Halteres pale yellow, the base of knob a trifle darkened. Legs with the coxæ obscure yellow, the fore coxæ a trifle darker; trochanters yellow; remainder of legs uniformly dark brown. Wings (Plate 1, fig. 19) with a faint brown tinge, the stigmal area scarcely darkened; veins pale brown. Venation: Sc_1 ending a trifle beyond the origin of R_s , Sc_2 opposite or close to this origin; basal section of R_5 of variable length, in cases very much reduced; branches of R_s elongate, more or less parallel on basal third; cell 1st M_2 closed; m-cu at or beyond the fork of M .

Abdominal tergites brownish yellow, the sternites more yellowish, with a more or less definite median darkening; hypopygium relatively large and conspicuous. Male hypopygium (Plate 3, fig. 38) with the outer lobe of basistyle, *b*, unusually long and slender, cylindrical, pale, with long erect setæ on mesal face. Dististyles, *d*, of the two sides slightly asymmetrical, in one the apical spine long and slender, gently sinuous, on the opposite side the corresponding spine shorter, more flattened, sinuous. Phallosome, *p*, a flattened compressed blade, bearing a large spinous point on basal third where the structure is strongly narrowed, thence dilated into a spatula.

Habitat.—Central Celebes (Bontoe Batoe District).

Holotype, male, Latimodjong Mountains, altitude 3,800 feet, May 15, 1931 (*Clagg*). Allotopotype, female. Paratopotypes, 12 of both sexes, May 15–16, 1931.

Gonomyia (Lipophleps) mitophora is readily told from all allied species of the subgenus by the coloration, venation, and structure of the male hypopygium. I am referring it to the

skusei group, despite the relatively short Sc which, in some cases, extends only to a slight distance beyond the origin of Rs.

GONOMYIA (LIPOPHLEPS) PERVILIS sp. nov. Plate 1, fig. 20; Plate 3, fig. 39.

Allied to *diacantha*; male hypopygium with the outer dististyle stout on basal half, the outer portion produced into a long smooth rod, at base on mesal edge with two blackened spines; cephalic-mesal portion of style further produced into a slender darkened rod; inner dististyle terminating in a relatively short spine; phallosome consisting chiefly of two flattened pale blades.

Male.—Length, about 3 millimeters; wing, 3.8.

Rostrum and palpi black. Antennæ chiefly black, the pedicel a little brightened. Head chiefly dark gray.

Pronotum and anterior lateral pretergites pale yellow. Mesonotum chiefly gray, the humeral region of præscutum restrictedly brightened; scutellum vaguely brightened on basal portion. Pleura dark, with a conspicuous silvery white longitudinal stripe extending from behind the fore coxæ to the meral region. Halteres dusky, the knobs obscure yellow. Legs with the fore coxæ brownish yellow; remaining coxæ darker; trochanters brownish testaceous; femora pale brown, the bases a little brightened, the tips narrowly darker brown; tibiæ and tarsi dark brown; femora with a row of evenly spaced erect setæ on ventral face, longer and more conspicuous on posterior femora. Wings (Plate 1, fig. 20) whitish subhyaline, clouded with darker, including major areas in all basal cells, especially R, along cord and in outer radial field; stigma long-oval, dark brown; veins brown, more yellowish in the ground areas. Venation: Sc₁ ending a short distance before the origin of Rs, the degree a little shorter than m-cu; anterior branch of Rs paralleling R₁; r-m long, arcuated; m-cu before the fork of M.

Abdomen dark brown; hypopygium yellow. Male hypopygium (Plate 3, fig. 39) with the outer dististyle, *od*, stout on basal portion, the outer part produced into a long, gently arcuated rod, its tip obtuse, the margin smooth; at base of this rod, on inner aspect with two blackened spines, the mesal one a little longer; on mesal face of style near base a further slender dark arm that bears a small subapical spine. Inner dististyle, *id*, with the apical spine short. Phallosome, *p*, appearing chiefly as two flattened pale blades that fill the whole genital chamber.

Habitat.—Central Celebes (Bontoe Batoe District).

Holotype, male, Latimodjong Mountains, altitude 3,800 feet, May 17, 1931 (*Clagg*).

Gonomyia (*Lipophleps*) *pervilis* is most nearly allied to *G.* (*L.*) *diacantha* Alexander (Mindanao), differing conspicuously in the structure of the phallosome and outer dististyle.

GONOMYIA (LIPOPHLEPS) GRESSITTI sp. nov. Plate 3, fig. 40.

Belongs to the *diffusa* group; male hypopygium with three dististyles, the intermediate one a long simple pale spine; inner style widely separated from the outer, appearing as a flattened blade that is narrowed on outer third into a slenderer blade whose base is surrounded by several setæ.

Male.—Length, about 3 millimeters; wing, 3.5.

Rostrum and palpi dark. Antennæ with scape dark; remainder of antennæ broken. Head chiefly dark.

Anterior lateral pretergites light yellow. Mesonotal præscutum and scutum brownish gray; humeral region of the former restrictedly paler; scutal lobes with posterior callosities light yellow; scutellum with posterior border broadly pale yellow. Pleura chiefly dark brown with a conspicuous silvery white longitudinal stripe, extending from above the fore coxæ to the base of abdomen. Legs with the femora obscure yellow, with a broad black terminal (forelegs) to nearly terminal ring; tibiæ obscure yellow, the bases and tips narrowly blackened; basitarsi obscure brownish yellow, the tips and remainder of tarsi black. Wings with a faint grayish tinge; stigma barely evident; veins pale brown. Venation: Sc relatively long, Sc₁ ending shortly before origin of Rs, Sc₂ close to its tip; anterior branch of Rs nearly straight and extending nearly parallel to R₁; m-cu shortly before the fork of M.

Abdominal tergites black, the caudal borders of the segments narrowly yellow. Male hypopygium (Plate 3, fig. 40) of the general type of *jacobsoniana* or *ramifera*, differing in all details. Outer dististyle, *od*, a gently arcuated simple rod; intermediate style, *md*, nearly as long, appearing as a slender pale needlelike spine; inner style, *id*, placed low down on the mesal face of basistyle, as in the group, appearing as a flattened blade, on about the outer third suddenly narrowed into a slenderer blade, at base of the latter with a group of several coarse setæ; base of inner style on cephalic portion with a group of setæ.

Habitat.—Formosa (south).

Holotype, male, Rokki, near river, altitude 400 to 500 feet, June 14, 1932 (*Gressitt*).

I take great pleasure in naming this distinct species in honor of the collector, Mr. J. Linsley Gressitt, to whom I am indebted

for several interesting Tipulidæ from Honshiu and Formosa. The nearest allies are *Gonomyia* (*Lipophleps*) *jacobsoniana* Alexander and *G. (L.) ramifera* Alexander (Sumatra to Mindanao), which differ most evidently in the structure of the male hypopygia.

ORMOSIA DIVERSIPENNIS sp. nov. Plate 1, fig. 21.

Mesonotal præscutum and scutum light brown, the posterior sclerites of mesonotum and the pleura darker brown; knobs of halteres light yellow; legs yellow, the femora with a narrow brown subterminal ring and indications of a broader but more diffuse annulus before midlength; wings buffy yellow, variegated over the entire surface by abundant patches of dark-colored trichia; outer ends of marginal cells yellow; abdomen dark brown.

Female.—Length, about 4 millimeters; wing, 4.8.

Rostrum brown; palpi brownish black. Antennæ brown, the flagellar segments vaguely bicolorous by having their apices slightly pale. Head dark brown, with conspicuous yellow setæ.

Mesonotal præscutum light brown, without markings; pseudosutural foveæ black, the tuberculate pits small and paler; setæ of interspaces yellow, long, and conspicuous; scutum light brown; scutellum and mediotergite darker brown, with indications of a dark median dash on scutum and scutellum. Pleura darker brown than the præscutum. Halteres pale, the knobs large, light yellow. Legs with the coxæ brown; trochanters brownish yellow; femora yellow, with a narrow brown subterminal ring; most of the femora are also more or less darkened on basal half, leaving a broad ring of the ground color at and beyond midlength; tibiæ and tarsi light yellow, the outer tarsal segments darker. Wings (Plate 1, fig. 21) with the ground color buffy yellow, the costal and apical borders extensively brighter yellow; entire surface of wing variegated by large patches of dark-colored trichia, these occurring in almost all cells; trichia elsewhere on disk light yellow, the total area of light and dark patches being not greatly disproportionate; conspicuous yellow areas at ends of all marginal cells; veins yellow, darker in the clouded areas. Macrotrichia of cells long and conspicuous. Venation: Tips of veins R_3 and R_4 strongly deflected cephalad; cell 1st M_2 open by atrophy of basal section of M_3 .

Abdomen dark brown. Valves of ovipositor long and conspicuous, dark horn-color.

Habitat.—Formosa (south).

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

Ormosia diversipennis is readily told from allied regional species of the genus by the pattern of the wings and legs, especially the former.

CRYPTOLABIS (BÆOURA) CONSOCIA sp. nov. Plate 1, fig. 22; Plate 3, fig. 41.

General coloration dark gray; antennæ black throughout; legs black, the setæ not conspicuously outspreading; scutellum behind broadly yellow; male hypopygium with the dististyle strongly narrowed on outer half into a fingerlike lobe; gonapophysis a flattened blade that bears two large triangular points.

Male.—Length, about 4.5 millimeters; wing, 4.8.

Rostrum dark above, yellow laterally; basal segments of palpi obscure yellow, the outer segments blackened. Antennæ black throughout, the scape a little pruinose; pedicel larger than the scape; basal flagellar segments short-oval to subcylindrical, the outer segments more elongate, with conspicuous verticils. Head light gray.

Pronotum brownish gray, narrowly yellow on sides. Anterior lateral pretergites yellow, variegated by dark brown spots. Mesonotal præscutum dark gray, with indications of a darker median stripe; scutum similarly darkened, the outer lateral portions more yellow; scutellum dark basally, the margin broadly yellow; mediotergite gray. Pleura gray; dorsopleural membrane paler. Halteres dusky. Legs with the coxæ dark; trochanters brownish testaceous; remainder of legs black, with chiefly yellow setæ of moderate length. Wings (Plate 1, fig. 22) with a grayish tinge, the prearcular and costal regions more nearly whitish; stigma faintly indicated; scarcely evident darkening along cord; veins brown. Venation: Sc_1 ending just before R_2 , Sc_2 some distance from its tip; R_3 lying close to R_{1+2} , a little constricting the cell before midlength; m-cu more than three-fourths its length beyond the fork of M; cell 2d A wide.

Abdomen, including hypopygium, dark brown. Male hypopygium (Plate 3, fig. 41) with the tergite, $9t$, conspicuous, the outer lateral angles appearing as glabrous, obtuse, earlike lobes. Dististyle, d , with the outer half strongly narrowed into a fingerlike lobe. Gonapophyses, g , appearing as pale yellow flattened blades, with two strong triangular points, the lateral point or spine larger than the apical one; outer margin of outer point and lower margin of lateral one with microscopic denticles.

Habitat.—Formosa (central).

Holotype, male, Heiganzan to Pianan-Anbu, Taichû-shû, July 19, 1932 (*Esaki*).

Cryptolabis (Bæoura) consocia is most nearly allied to *C. (B.) aliena* (Alexander), differing especially in the details of structure of the male hypopygium. The hypopygium of *aliena* is shown for comparison (Plate 3, fig. 42), the most conspicuous differences being the more evident ears of the tergite, 9*t*, the longer apical point of the dististyle, *d*, and, especially, the differently shaped gonapophyses, *g*, with the outer point or lobe obtuse and microscopically roughened, the lateral point a very long and slender, gently arcuated blade.

CRYPTOLABIS (BÆOURA) LÆVILOBATA sp. nov. Plate 1, fig. 23; Plate 3, fig. 43.

General coloration of thorax and abdomen dull black; head light gray; setæ of legs long and conspicuous, erect; wings almost uniformly tinged with blackish, the apical cells paler; male hypopygium with the tergite strongly narrowed outwardly, terminating in two slender glabrous lobes that are separated from one another only by a deep U-shaped notch, the margins of the lobes smooth; fused gonapophyses with a median lobule between the short fleshy arms.

Male.—Length, about 4 millimeters; wing, 4.6.

Female.—Length, about 4 millimeters; wing, 5.4.

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

Mesonotum almost entirely deep black, only moderately polished; scutellum obscure yellow. Pleura dull black. Halteres with the stem dark, the base narrowly pale, the knob yellow. Legs with the coxæ and trochanters brownish black; remainder of legs brownish black, conspicuously hairy. Wings (Plate 1, fig. 23) with an almost uniform blackish tinge, the apex narrowly paler; stigma appearing as a linear darkened seam on R_{1+2} ; veins and macrotrichia black. Venation: Sc_1 ending shortly beyond the fork of R_s , Sc_2 some distance before this fork; R_{2+3} a trifle longer than R_2 alone; m-cu close to midlength of M_{3+4} .

Abdomen dull black, including the genitalia of both sexes. Male hypopygium (Plate 3, fig. 43) with the ninth tergite, 9*t*, strongly narrowed outwardly, terminating in two slender glabrous lobes that are separated from one another only by a deep and narrow U-shaped notch; margins of the lobes smooth and without setæ. Dististyle, *d*, shorter than in *trichopoda*. What

are interpreted as being gonapophyses, *g*, appear as two short divergent arms, with the median area produced to lie beyond the level of these arms.

Habitat.—Formosa (north).

Holotype, male, Rimozan, May 2, 1933 (*Issiki*). Allotopotype, female.

The nearest ally of the present fly is undoubtedly *Cryptolabis* (*Bæoura*) *trichopoda* Alexander (southern Formosa) which, while very similar in general appearance, yet is conspicuously different in the structure of the hypopygium. It should be noted that these two species have the internal structures of the hypopygium very different from the other Formosan species, the large and prominent gonapophyses of *aliena* Alexander and *consocia* sp. nov., here being lacking or greatly reduced in size, or else being represented by the fused median structure (Plate 3, fig. 43, *g*), which would then form a phallosomic structure similar to that found in the genus *Molophilus*.

CRYPTOLABIS (BÆOURA) TRICHOPODA HASSENENSIS subsp. nov. Plate 3, fig. 44.

Male.—Length, about 4 millimeters; wing, 4.6.

Characters as in typical *trichopoda* Alexander, differing especially in slight details of structure of the male hypopygium (Plate 3, fig. 44). Ninth tergite, *9t*, with the lateral lobes very conspicuous, separated by a U-shaped notch, the flattened margins of the lobes with delicate serrations. Dististyle, *d*, more evenly curved.

Habitat.—Formosa (central).

Holotype, male, Hassenzan, Kahodai to Reimei, Taichû-shû, July 12, 1932, (*Esaki*).

MOLOPHILUS CELEBESICUS sp. nov. Plate 1, fig. 24; Plate 3, fig. 45.

Belongs to the *gracilis* group and subgroup; general coloration black; antennæ (male) of moderate length, brownish black throughout; wings very strongly tinged with brownish black; male hypopygium with all lobes of basistyle obtuse at tips; outer dististyle a slender, nearly straight rod, the outer end microscopically roughened; inner dististyle of similar length but broader, at near two-thirds the length with the margin produced into an acute blackened spine.

Male.—Length, about 3.8 to 4 millimeters; wing, 4.6 to 4.8.

Rostrum and palpi black. Antennæ (male) moderately elongate, if bent backward extending to the wing root, brownish black throughout. Head black, with a sparse pruinosity.

Mesonotum black, the anterior lateral pretergites restrictedly more reddish brown. Pleura dull black. Halteres brownish black. Legs brownish black throughout. Wings (Plate 1, fig. 24) very strongly suffused with brownish black; veins a little darker than the ground color; macrotrichia unusually long and conspicuous. Venation: R_2 lying shortly beyond the level of r-m; vein 2d A extending to about opposite the basal fifth of the petiole of cell M_3 .

Abdomen, including the hypopygium, black. Male hypopygium (Plate 3, fig. 45) with all lobes of basistyle, *b*, obtuse, unarmed with spinous points. Outer dististyle, *od*, a small, slender, nearly straight rod, its outer end microscopically roughened. Inner dististyle, *id*, of about the same length as the outer, appearing as a straight flattened rod, at near two-thirds the length with the margin produced into an acute black spine, surrounding the base of which are several delicate setæ, additional to the rather numerous setigerous punctures elsewhere on the sclerite.

Habitat.—Central Celebes (Bontoe Batoe District).

Holotype, male, Latimodjong Mountains, altitude 4,500 to 6,000 feet, May 25, 1931 (*Clagg*). Paratopotypes, 3 males.

Molophilus celebesicus is very different from all other black species of the genus in the structure of the male hypopygium, more especially of the inner dististyle.

ILLUSTRATIONS

[a, *Æ*deagus; b, basistyle; d, dististyle; dd, dorsal dististyle; g, gonapophysis; i, interbase; id, inner dististyle; md, intermediate dististyle; od, outer dististyle; p, phallosome; t, tergite; vd, ventral dististyle.]

PLATE 1

- FIG. 1. *Tipula* (*Lunatipula*) *multibarbata* sp. nov., venation.
2. *Dolichopeza* (*Nesopeza*) *toala* sp. nov., venation.
3. *Dolichopeza* (*Nesopeza*) *profundemarginata* sp. nov., venation.
4. *Dolichopeza* (*Nesopeza*) *toraja* sp. nov., venation.
5. *Limonia* (*Libnotes*) *falsa* sp. nov., venation.
6. *Limonia* (*Libnotes*) *comissabunda* sp. nov., venation.
7. *Limonia* (*Limonia*) *alopecura* sp. nov., venation.
8. *Limonia* (*Limonia*) *inscita* sp. nov., venation.
9. *Limonia* (*Euglochina*) *curtata* sp. nov., venation.
10. *Helius* (*Helius*) *copiosus* sp. nov., venation.
11. *Orimarga* (*Orimarga*) *gymnoneura* sp. nov., venation.
12. *Orimarga* (*Orimarga*) *griseipennis* sp. nov., venation.
13. *Orimarga* (*Orimarga*) *toala* sp. nov., venation.
14. *Orimarga* (*Orimarga*) *hypopygialis* sp. nov., venation.
15. *Epiphragma* (*Polyphragma*) *minahassana* sp. nov., venation.
16. *Limnophila* (*Tricholimnophila*) *ferocia* sp. nov., venation.
17. *Elephantomyia* (*Elephantomyodes*) *infumosa* sp. nov., venation.
18. *Trentepohlia* (*Trentepohlia*) *proba* sp. nov., venation.
19. *Gonomyia* (*Lipophleps*) *mitophora* sp. nov., venation.
20. *Gonomyia* (*Lipophleps*) *pervilis* sp. nov., venation.
21. *Ormosia* *diversipennis* sp. nov., venation.
22. *Cryptolabis* (*Bæoura*) *consocia* sp. nov., venation.
23. *Cryptolabis* (*Bæoura*) *lævilobata* sp. nov., venation.
24. *Molophilus* *celebesicus* sp. nov., venation.

PLATE 2

- FIG. 25. *Tipula* (*Lunatipula*) *multibarbata* sp. nov., male hypopygium, details.
26. *Tipula* (*Lunatipula*) *multibarbata* sp. nov., male hypopygium, eighth sternite.
27. *Dolichopeza* (*Nesopeza*) *toala* sp. nov., male hypopygium, details.
28. *Dolichopeza* (*Nesopeza*) *profundemarginata* sp. nov., male hypopygium, details.
29. *Dolichopeza* (*Nesopeza*) *toraja* sp. nov., male hypopygium, details.
30. *Limonia* (*Libnotes*) *falsa* sp. nov., male hypopygium.
31. *Limonia* (*Limonia*) *alopecura* sp. nov., male hypopygium.
32. *Limonia* (*Limonia*) *inscita* sp. nov., male hypopygium.
33. *Helius* (*Helius*) *copiosus* sp. nov., male hypopygium.
34. *Orimarga* (*Orimarga*) *gymnoneura* sp. nov., male hypopygium.
35. *Orimarga* (*Orimarga*) *hypopygialis* sp. nov., male hypopygium.

PLATE 3

- FIG. 36. *Epiphragma* (*Polyphragma*) *minahassana* sp. nov., male hypopygium.
37. *Limnophila* (*Tricholimnophila*) *ferocia* sp. nov., male hypopygium.
38. *Gonomyia* (*Lipophleps*) *mitophora* sp. nov., male hypopygium.
39. *Gonomyia* (*Lipophleps*) *pervilis* sp. nov., male hypopygium.
40. *Gonomyia* (*Lipophleps*) *gressitti* sp. nov., male hypopygium.
41. *Cryptolabis* (*Bæoura*) *consocia* sp. nov., male hypopygium.
42. *Cryptolabis* (*Bæoura*) *aliena* Alexander, male hypopygium.
43. *Cryptolabis* (*Bæoura*) *lævilobata* sp. nov., male hypopygium.
44. *Cryptolabis* (*Bæoura*) *trichopoda hassenensis* subsp. nov., male hypopygium.
45. *Molophilus celebesicus* sp. nov., male hypopygium.

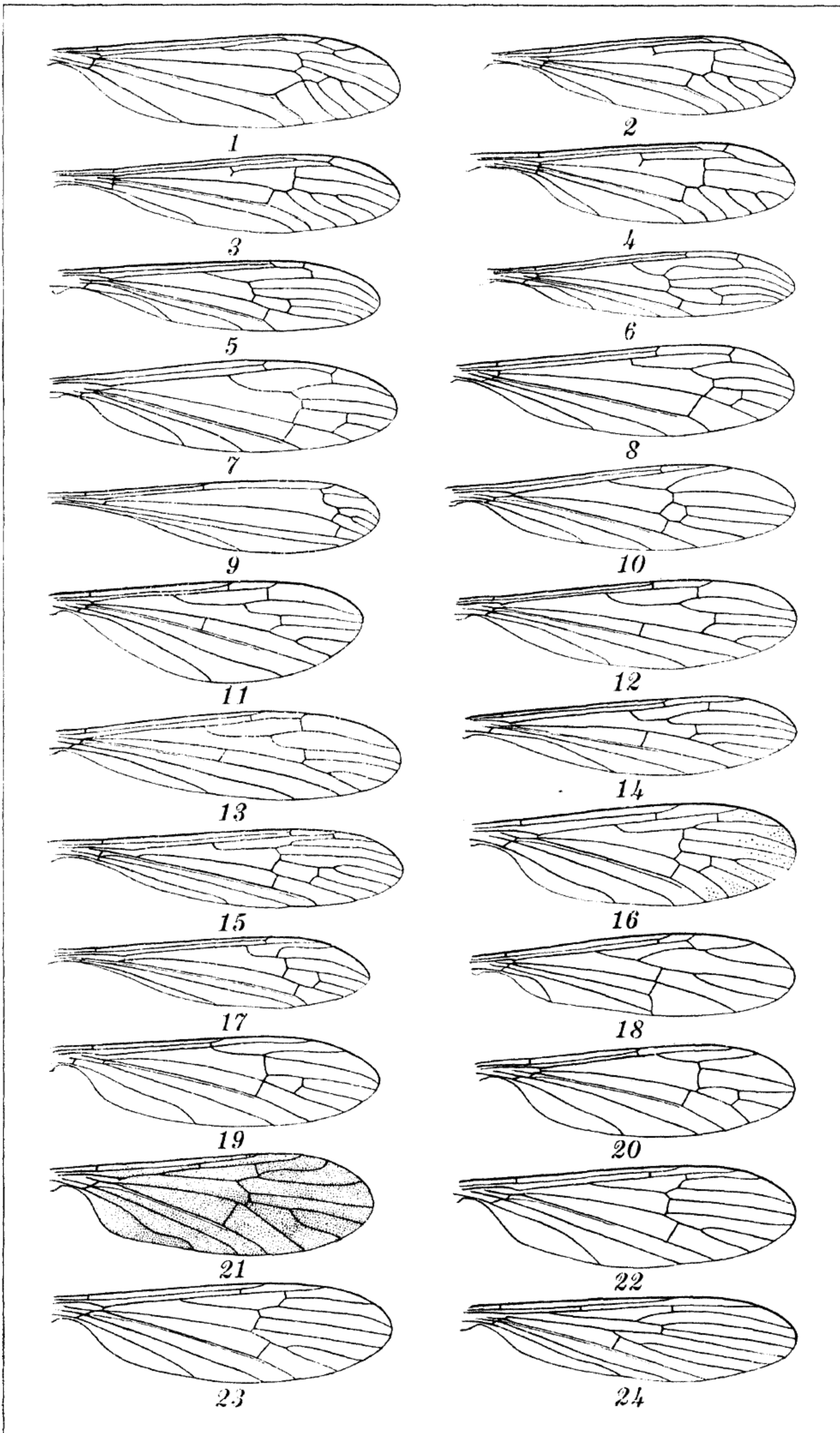


PLATE 1.

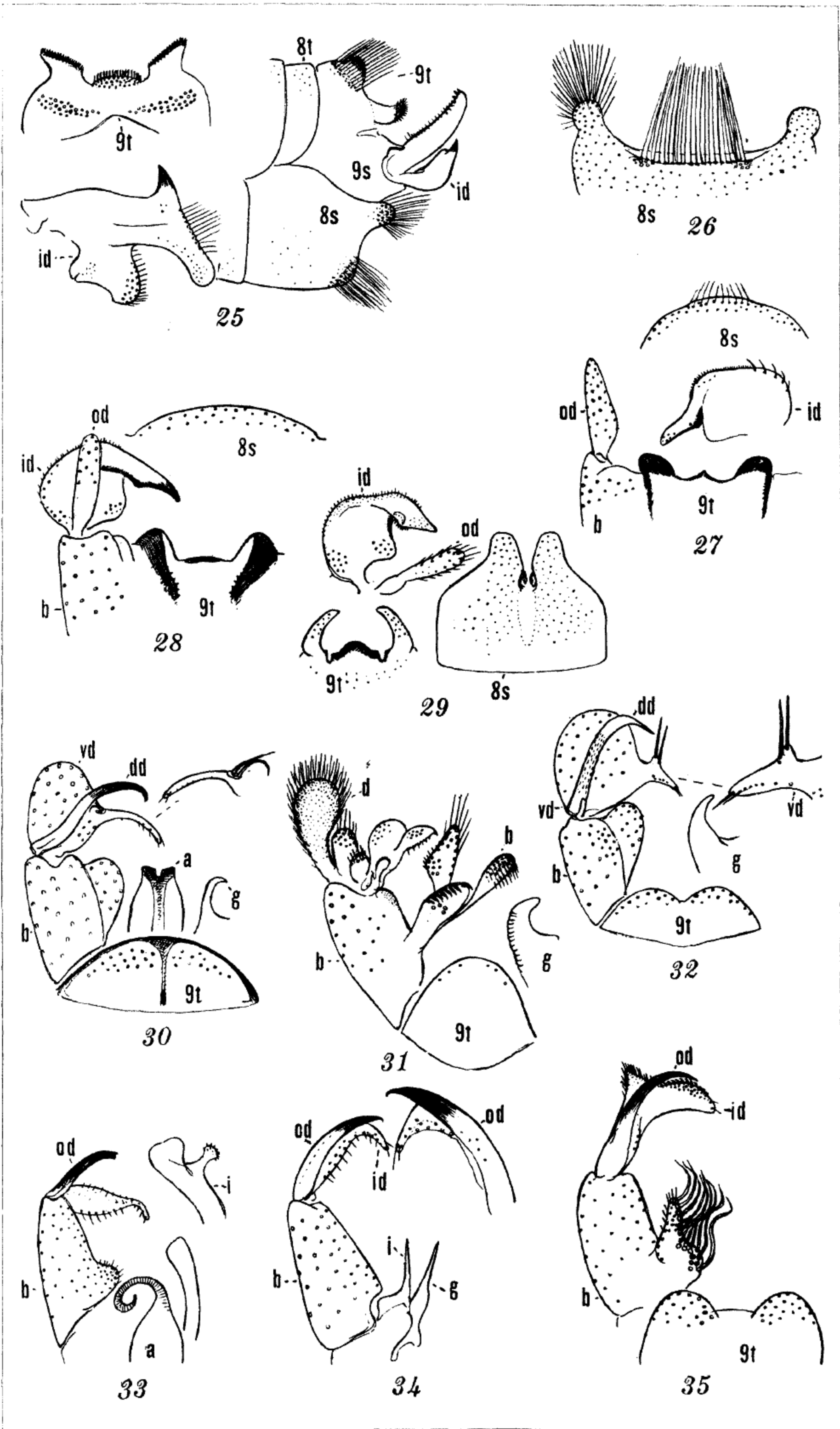


PLATE 2.

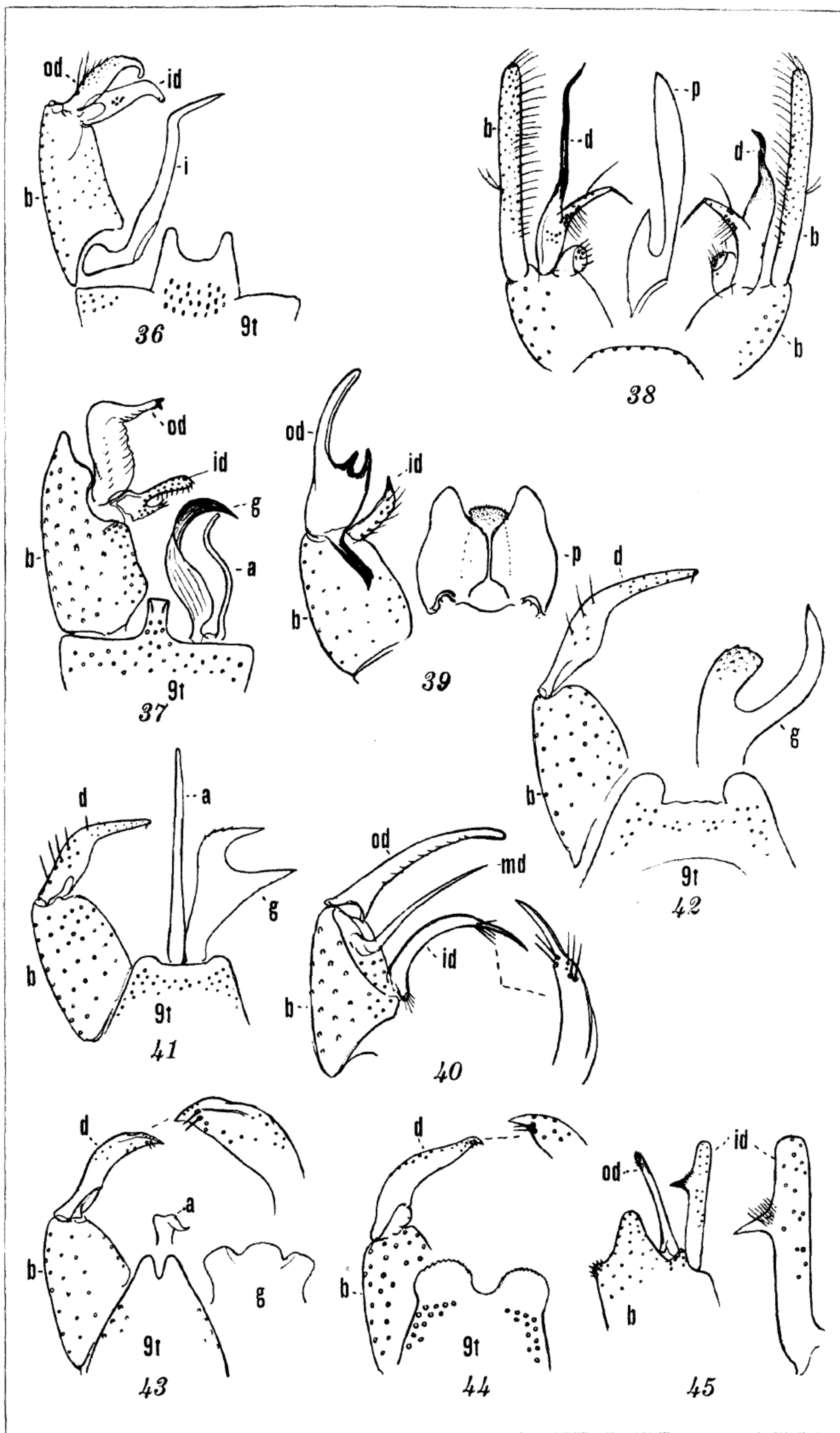


PLATE 3.