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ASIA (DIPTERA), V

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Separate from
THE PHILIPPINE JOURNAL OF SCIENCE
Published by the Bureau of Science of the Philippine Government
Manila, P. I.
VOLUME 40, No. 4, DECEMBER, 1929

MANILA
BUREAU OF PRINTING
1929

NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN ASIA (DIPTERA), V¹

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TWO PLATES

The crane flies discussed at the present time are almost entirely from the mountains of Formosa, where they were collected by my friend Prof. Syuti Issiki. The most interesting series are those taken at Shōrei (Syōrei) at an altitude of 7,000 to 8,000 feet, in late October, representing a tipulid fauna that is quite characteristic of the Palæarctic Region in autumn. I am very greatly indebted to Professor Issiki for the privilege of retaining the types of the novelties described at this time.

In the present report, nine genera and subgenera of Tipulidæ are added to the Formosan fauna; namely, *Stibadocerella*, *Cytartomyia*, *Discobola*, *Thaumastoptera*, *Ula*, *Troglophila*, *Pilaria*, *Cladura*, and *Neolimnophila*. This brings the total of generic and subgeneric groups for the island to more than seventy, a number that is greater than that of Europe or of America north of Mexico. The additional groups found in the major islands of Japan bring the number for the Japanese Empire to approximately one hundred, with several additional genera and subgenera that are regional and will almost certainly be taken as a result of future collecting.

TIPULINÆ

NESOPEZA BASISTYLATA sp. nov.

General coloration yellowish brown, the mesonotal præscutum with a narrow brown median vitta; antennæ relatively long, the basal segments yellow, the flagellum black; verticils of flagellar segments short; femora and tibiæ yellowish brown, the tarsi chiefly snowy white; wings suffused with brown, the stigma darker; abdomen dark brown, the segments ringed with yellow, especially the sternites; male hypopygium with the basistyles

¹ Contribution from the Department of Entomology, Massachusetts Agricultural College.

greatly produced into slender arms that are tufted with black setæ.

Male.—Length, about 8.5 millimeters; wing, 9.5; antennæ, about 3.3.

Female.—Length, about 8.5 millimeters; wing, 9.3.

Frontal prolongation of head pale brown, darker medially above; palpi dark brown. Antennæ (male) relatively long, the basal segments obscure yellow, the flagellar segments beyond the first passing into brownish black; flagellar segments elongate-cylindrical, gradually decreasing in length outwardly, clothed with a short, erect, pale pubescence and slightly longer black verticils that are more or less unilaterally arranged and shorter than the segments themselves. Head light brown.

Pronotum dark brown. Mesonotal præscutum rather light yellowish brown, with a narrow brown median line; posterior sclerites of mesonotum somewhat darker, especially the post-notal mediotergite; humeral region of præscutum restrictedly pale yellow. Pleura pale, the sternopleurite and meron darker, producing a more or less distinct longitudinally striped appearance. Halteres elongate, dark brown, the base of the stem restrictedly yellow. Legs with the coxæ yellowish testaceous; trochanters pale yellow; femora and tibiæ yellowish brown, the tarsi chiefly snowy white. Wings (Plate 1, fig. 1) with a strong brownish suffusion, the costal and apical regions somewhat darker; stigma conspicuous, dark brown, irregular in outline, oval, with a basal extension in cell Sc_1 almost to the fork of Sc ; cord vaguely seamed with darker; a feebly indicated pale antestigmal spot; veins dark brown, the oblitative areas restricted. Venation: Sc_1 lacking; Sc_2 at near three-fourths the length of Rs , the latter arcuated; forks of medial field relatively shallow; m-cu at less than one-half its length before the fork of M .

Abdominal tergites chiefly dark brown, the basal segments with a yellowish triangle on either side at near midlength; sternites even more conspicuously banded, dark brown, the extreme base narrowly yellow, with an additional wider yellow ring at near midlength of the sclerite; subterminal segments with the basal pale ring lacking, becoming more uniformly darkened; hypopygium chiefly yellow. In the female, the banded abdominal pattern is much less distinct. Male hypopygium (Plate 2, fig. 25) with the ninth tergite, $9t$, having the caudal margin blackened, trilobed, the lateral lobes larger and wider, the me-

dian lobe very low; on ventral surface back from each lateral lobe extends a blackened serrated bar. Basistyle, *b*, very greatly produced caudad, before midlength on mesal face with a tumid swelling set with abundant microscopic setulæ; beyond this enlargement, the style is slender, curved gently mesad, at apex with a tuft of black setæ. Outer dististyle, *od*, long and slender.

Habitat.—Formosa.

Holotype, male, Rantaizan, altitude 4,000 to 6,000 feet, May 20, 1928 (*S. Issiki*). Allotopotype, female.

CYLINDROTOMINÆ

Genus STIBADOCERELLA Brunetti

Stibadocerella BRUNETTI, Rec. Indian Mus. 15 (1918) 283.

Agastomyia DE MEIJERE, Bijd. tot de Dierkunde 21 (1919) 17.

The genus *Stibadocerella* has been represented only by two closely allied species, *S. pristina* Brunetti, from the Garo Hills, Assam, altitude 3,500 to 3,900 feet, collected in July by Kemp; and *S. albitarsis* (de Meijere) from Korinchi, Sumatra, taken in September by Jacobson. The discovery of a third closely allied species in Formosa is thus of great interest.

STIBADOCERELLA FORMOSENSIS sp. nov.

Thorax polished reddish brown, without distinct stripes; body with strong greenish tints; tips of fore tibiæ broadly white; wings with the second section of R_s longer than R_{4+5} , cell R_3 being relatively small; cell 1st M_2 large, exceeding the longest vein beyond it.

Female.—Length, about 12 millimeters; wing, 9.2.

Rostrum and palpi greenish brown. Antennæ with the scapal segments green, the flagellum black; antennæ about as long as the combined head and thorax. Head broad, greenish brown.

Mesonotum polished reddish brown, without distinct stripes, the margins and posterior sclerites with greenish tints. Halteres brownish black. Legs with the coxæ and trochanters green; femora brownish black; tibiæ black, the base narrowly ringed with white, more broadly so on the fore tibiæ; tips of fore tibiæ broadly white (2 millimeters); fore basitarsi much shorter than the tibiæ, black, the extreme tip pale; remainder of tarsi snowy white; posterior legs stouter, the tips of the tibiæ darkened; basitarsi with about the distal fourth white. Wings (Plate 1, fig. 2) with the coloration as in the other species, nearly hyaline, with very distinct black veins; stigma lacking. Venation: Basal section of R_s nearly straight, subequal to the second section;

R_{2+3} subperpendicular; R_{4+5} distinctly shorter than the second section of R_s , cell R_3 relatively short; cell 1st M_2 very large, exceeding in length the cells beyond, the second section of M_{1+2} equal to the outer section; $m-cu$ longer than the distal section of Cu_1 ; vein 2d A represented by a marginal thickening to nearly opposite midlength of cell 1st A.

Abdomen chiefly greenish brown. Ovipositor with the valves unusually developed for a member of the *Cylindrotominae*, the tergal valves especially well-formed, margined with conspicuous setae, the basal half of the valve blackened, the outer half paling to green.

Habitat.—Formosa.

Holotype, female, Rantaizan, 4,000 to 6,000 feet, May 20, 1928 (*S. Issiki*).

It has generally been assumed that the second anal vein was lacking in this genus, but this is not exactly true. It is represented by an axillary marginal thickening, the cell itself being reduced to a linear strip lying proximad of the level of the arculus.

Through the kindness of Dr. Singh Pruthi, I have been able to examine a paratype of *S. pristina* Brunetti and have included a few supplementary notes concerning this species:

Male.—Length, about 10 millimeters; wing, 9.2; antennae, about 13.

Antennae (male) much longer than the body, as shown by the measurements, pale yellow, the outer segments of the flagellum darker. Body coloration as described by Brunetti. Præscutal stripes distinctly separated. Pale ring at base of tibiae distinct; pale apex of fore tibiae relatively wide (1.7 millimeters), slightly thickened, the setae similarly white; fore and middle basitarsi about as long as the respective tibiae, brown, only the extreme tips of each a little whitened. Wings (Plate 1, fig. 3) hyaline, the veins black. Venation: Sc_1 ending before $r-m$, Sc_2 at its tip; second section of R_s a little shorter than the basal section; R_{2+3} oblique; free tip of Sc_2 and R_{1+2} entirely atrophied; cell 1st M_2 large, roughly rectangular; $m-cu$ longer than the distal section of Cu_1 , vein Cu_2 evident to opposite $m-cu$; vein 1st A long, nearly straight; vein 2d A very short, opposite the arculus becoming confluent with the anal margin of the wing.

Genus CYTTAROMYIA Scudder

Cyttaromyia SCUDDER, Bull. U. S. Geol. Geogr. Surv. Terr. 3 (1877) 751; Proc. Am. Phil. Soc. 32 (1894) 190-194.

The genus *Cyttaromyia* has been known only from the Tertiary, having been especially characteristic of the Florissant beds of Colorado (Miocene). I am referring to this genus with some question a remarkable cylindrotomine fly from Formosa that is certainly distinct from *Cylindrotoma*. The venation of one wing of the unique type of the present species conforms closely to the essential features of the known species of *Cyttaromyia*, but the opposite wing has lost the supernumerary cross-vein in cell R_5 that furnishes the chief character of the genus. The most notable features of the present fly are the very large, nearly contiguous eyes, the coarsely punctured thoracic dorsum and pleura (which reminds one strongly of the otherwise distinct *Stibadocera*), and the venation, cell M_1 being present, connected with vein R_{4+5} by a supernumerary or adventitious cross-vein, forming an accessory discal cell immediately above the true cell 1st M (Plate 1, fig. 4), the last feature possibly not constant. It should be noted that the present fly disagrees with Scudder's definition of *Cyttaromyia* in the loss of Sc_1 and in the presence of tibial spurs.

CYTTAROMYIA TAIWANIA sp. nov.

General coloration black, the thorax coarsely punctured; antennae (male) elongate, nearly as long as the body, the flagellar segments cylindrical, with short verticils; eyes (male) almost contiguous on anterior vertex.

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

Rostrum and palpi black. Antennae dark brown, in male nearly as long as the body; flagellar segments elongate-cylindrical, with scattered pubescence and verticils that are much shorter than the segments; antennal segments broken beyond the twelfth; flagellar segments gradually increasing in length to the fifth or sixth, thence shortening outwardly. Head dull black, impunctate; eyes large, with coarse ommatidia, in the male almost contiguous on the anterior vertex.

Mesonotum black, the surface with conspicuous coarse punctures, the three præscutal stripes and centers of the scutal lobes nearly smooth. Pleura black, the extensive dorsopleural membrane pale yellow; pleura, except the sternopleurite, with numerous coarse punctures. Halteres elongate, infuscated, the base of the stem narrowly pale yellow. Legs with the coxæ smooth, brownish black; trochanters obscure yellow; femora obscure yellow, the tips slightly more infuscated; tibiae brownish yellow,

the tips very narrowly darkened; tarsi obscure yellow, passing into black. Wings (Plate 1, fig. 4) with a uniform grayish brown suffusion, without a stigma; veins dark brown. Venation: Sc_1 lacking, Sc_2 ending just before the fork of Rs; Rs long, arcuated at origin, in alignment with R_{4+5} ; R_{2+3} interstitial with r-m, arising at end of Rs; free tip of Sc_2 preserved; distal end of R_2 entirely atrophied; a supernumerary crossvein in cell R_3 of the right wing of type, lacking in the left wing; medial field as in *Cylindrotoma*; m before to just beyond the fork of M_{1+2} ; m-cu beyond midlength of cell 1st M_2 , subequal to the distal section of Cu_1 .

Abdomen elongate, brownish black, nearly smooth except for the transverse impressed areas; hypopygium black.

Habitat.—Formosa.

Holotype, male, Rantaizan, altitude 4,000 to 6,000 feet, May 20, 1928 (*S. Issiki*).

LIMONIINÆ

LIMONIINI

LIMONIA (LIBNOTES) CLITELLIGERA sp. nov.

Thorasic dorsum chiefly polished black; pleura, pleurotergite, and scutellum reddish yellow; femora obscure yellow, the tips weakly darkened; wings grayish, the cells beyond the cord strongly darkened; most veins of wing seamed with brown; Sc long; R_2 and free tip of Sc_2 in transverse alignment; m-cu beyond fork of M; anal veins divergent.

Female.—Length, about 8 millimeters; wing, 9.

Rostrum and palpi dark brown; terminal segment of maxillary palpi small. Antennæ black throughout; flagellar segments with the verticils of upper surface very long, arranged unilaterally in pairs; outer flagellar segments elongate. Head dull black, the restricted frons gray; eyes large, nearly contiguous on the dorsum, restricting the anterior vertex at this point to a linear strip.

Pronotum, mesonotal præscutum, and scutal lobes polished black, the humeral region of the præscutum very restrictedly pale; median region of scutum and scutellum reddish brown; postnotal mediotergite black. Pleura and pleurotergite uniformly reddish yellow, including the dorsopleural membrane. Halteres obscure yellow, the knobs dark brown. Legs with the coxæ and tronchanters reddish yellow; femora obscure yellow, the tips weakly darkened; remainder of legs obscure yellow, the terminal tarsal segments black; legs relatively long and slender.

Wings (Plate 1, fig. 5) dimidiated, the cells beyond the cord strongly darkened, the basal cells more grayish; costal region, and especially cell Sc , more darkened; stigma short-oval, brown; prearcular cells and axillary region darkened; a large cloud at origin of Rs; narrow but conspicuous brown seams along Cu , the cord and outer end of cell 1st M_2 ; other longitudinal veins less distinctly seamed with brown; veins dark brown. Venation: Sc very long, ending some distance beyond r-m; R_2 and free tip of Sc_2 pale, in transverse alignment; Rs arcuated at origin, more than three times the basal section of R_{4+5} ; radial veins long, generally parallel cell 1st M_2 relatively small; m-cu a little less than its length beyond the fork of M; anal veins gently divergent at base.

Abdominal tergites dark brown, the outer segments more reddish brown; sternites more yellowish brown. Ovipositor with the genital segment obscure yellow; tergal valves slender, gently curved; sternal valves stouter, their bases darkened.

Habitat.—Formosa.

Holotype, female, Rantaizan, altitude 4,000 to 6,000 feet, May 20, 1928 (*S. Issiki*).

The peculiar body coloration and wing pattern readily separate the present species from other described species of *Libnotes*.

LIMONIA (LIMONIA) TENUICULA sp. nov.

General coloration yellowish brown, the præscutum with a median dark brown discal area; antennæ moniliform, black throughout; wings with a pale brown tinge, the stigma darker; Sc_1 ending beyond midlength of Rs; inner end of cell 1st M_2 strongly arcuated; m-cu beyond the fork of M; male hypopygium with the ventral dististyle small, the rostral prolongation small, without spines.

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

Rostrum and palpi brownish black. Antennæ brownish black throughout; flagellar segments strongly nodulose, the segments short-oval with glabrous apical necks; terminal segment elongate, narrowed to a point. Head dark blackish gray.

Mesonotal præscutum brownish yellow, the disk polished dark brown to brownish black, restricting the ground color to the humeral and lateral portions; remainder of mesonotum dark brown. Pleura yellowish brown. Halteres relatively short, dark brown, the base of the stem narrowly yellow. Legs with the coxæ and trochanters yellowish testaceous; femora pale brown, passing to darker at tips; tibiæ and tarsi pale brownish

yellow, the terminal tarsal segments darker. Wings (Plate 1, fig. 6) relatively narrow, with a pale brownish tinge, the short-oval stigma darker brown; veins dark brown. Venation: Sc relatively long, Sc₁ ending shortly beyond midlength of Rs, Sc₂ at its tip; free tip of Sc₂ and R₂ in alignment; inner end of cell 1st M₂ strongly arcuated; veins beyond cell 1st M₂ elongate; m-cu about one-third its length beyond the fork of M.

Abdominal tergites dark brown, the sternites somewhat paler. Male hypopygium (Plate 2, fig. 26) with the tergite, 9t, transverse, each low lateral lobe with about four long setæ; what appears to be the median ventral portion of the tergite is produced into a rectangular plate that is densely set with short even setæ. Basistyle, *b*, long, the ventromesal lobe relatively small. Dorsal dististyle apparently represented by a simple nearly straight rod, the tip acute. Ventral dististyle, *vd*, very small, the main body of the organ about the size of the lobe of the basistyle, with a few long setæ, the mesal apical portion produced into a small slender spinous beak; rostral prolongation very large and flattened, without evident armature other than setæ.

Habitat.—Formosa.

Holotype, male, Shinten, April 15, 1928 (*S. Issiki*).

LIMONIA (DISCOBOLA) MARGARITA (Alexander).

Discobola margarita ALEXANDER, Philip. Journ. Sci. 24 (1924) 539-540.

Known hitherto only from Karafuto and Hokkaido, northern Japan. A female, Mount Rantaizan, Formosa, altitude 7,000 feet, June 3, 1927 (*S. Issiki*).

LIMONIA (DISCOBOLA) ARGUS (Say).

Limnobia argus SAY, Long's Exped., Append. (1824) 358.

A wide-ranging species in northern North America and north-eastern Asia, not before recorded from south of the main island of Japan. A female, Shorei, Formosa, altitude 7,000 to 8,000 feet, October 25, 1928 (*S. Issiki*).

LIMONIA (DICRANOMYIA) AURITA sp. nov.

Belongs to the *morio* group; size large (wing, male, over 7 millimeters); Sc₁ long; male hypopygium with the caudolateral angles of the tergite produced into long slender arms; ventromesal lobe of basistyle long, boomerang-shaped; outer dististyle bifid at apex.

Male.—Length, about 7.5 millimeters; wing, 7.4.

Rostrum and palpi black. Antennæ black throughout; flagellar segments oval to long-oval. Head black, the frons more silvery pruinose.

Mesonotum polished black, the median region of the scutum, the scutellum, and the cephalic portion of the postnotal mediotergite slightly more pruinose. Pleura black, with a gray pruinose. Halteres yellow, the knobs brownish black. Legs with the fore and middle coxæ polished black, the apices more yellowish; posterior coxæ obscure yellow, trochanters yellow; remainder of legs black, the femora yellow basally, narrowest on the fore femora where about the basal fourth is included, least evident on the posterior femora where only the tips are darkened. Wings (Plate 1, fig. 7) with a brownish tinge, the oval stigma darker brown; veins dark brown. Venation: Sc short, Sc₁ ending shortly before the origin of Rs, Sc₂ far before the tip, Sc₁ alone being nearly as long as Rs; free tip of Sc₂ shortly proximal of the level of R₂; m-cu shortly before the fork of M, subequal to the distal section of Cu₁; vein 2d A relatively long.

Abdomen black, the caudal margins of the basal sternites obscure yellow; hypopygium chiefly dark. Male hypopygium (Plate 2, fig. 27) with the ninth tergite, 9t, transverse, the outer lateral angles produced caudad and slightly mesad into long slender arms that are tipped with short setæ. Basistyle, *b*, relatively small, the ventromesal lobe large and of very unusual form, being more or less boomerang-shaped, the outer margin at the angulation with a few longer setæ; a small tubercle on mesal face of basistyle toward apex; a conspicuous pencil of long setæ that are curved at tips, located near base of style. Outer dististyle, *od*, bifid and blackened at apex. Inner dististyle, *id*, fleshy, irregular in shape, the rostral prolongation very stout, with a single pale spine. Gonapophyses with the mesal apical angle slender.

Habitat.—Formosa.

Holotype, male, Ritozan, altitude 5,000 feet, August 1, 1928 (*S. Issiki*).

Limonia (*D.*) *aurita* is very distinct from the other regional members of the *morio* group. The peculiar characters of the basistyle and outer dististyle of the male hypopygium are suggested by *L. (D.) pseudomorio* Alexander (Japan).

LIMONIA (DICRANOMYIA) MONTIUM sp. nov.

General coloration brownish gray, the pronotum and mesonotal præscutum with a median dark brown stripe; antennæ entirely black; wings grayish, the oval stigma darker; Sc₁ ending

shortly beyond, Sc₂ nearly opposite, the origin of Rs; cell 1st M₂ relatively large; m-cu at the fork of M; male hypopygium with a single spine on the rostral prolongation of the ventral dististyle.

Male.—Length, about 6.5 millimeters; wing, 8.2.

Rostrum black, sparsely pruinose; palpi black. Antennæ black throughout; flagellar segments subglobular, passing into oval, the terminal segment longer than the penultimate; segments clothed with a dense white pubescence. Head grayish brown; anterior vertex of moderate width, with an impressed median line.

Pronotum gray, black medially. Mesonotal præscutum brownish gray with a median dark brown stripe that is slightly constricted before midlength, somewhat wider behind; posterior sclerites of the mesonotum dark gray, the centers of the scutal lobes dark brown. Pleura dark brown, heavily pruinose. Halteres yellow, the knobs weakly infuscated. Legs with the fore and middle coxæ dark, pruinose; posterior coxæ and all trochanters yellow; femora obscure brownish yellow at base, passing into dark brown at tips; remainder of legs black. Wings (Plate 1, fig. 8) with a grayish tinge, the oval stigma darker; veins dark brown, with long conspicuous black macrotrichia. Venation: Sc₁ ending shortly beyond the origin of Rs, Sc₂ immediately before this origin; Rs about two and one-half times the more-arcuated basal section of R₄₊₅; free tip of Sc₂ and R₂ in approximate alignment; cell 1st M₂ large, longer than the veins beyond it; basal section of M₃ arcuated to feebly angulated; m-cu at fork of M.

Abdomen brownish black, sparsely pruinose. Male hypopygium (Plate 2, fig. 28) with the ninth tergite, 9*t*, transverse, the caudal margin gently emarginate, the lateral lobes low. Basistyle, *b*, relatively small, the ventromesal lobe large, obtuse. Outer dististyle, *od*, only moderately curved, the tip suddenly narrowed into a slightly decurved black point. Ventral dististyle, *id*, large and fleshy, the rostral prolongation flattened, the tip twisted and pendulous; a single rostral spine of moderate size. Gonapophyses, *g*, with the mesal apical lobe stout, its lateral margin microscopically serrulate.

Habitat.—Formosa.

Holotype, male, Shōrei, altitude 7,000 to 8,000 feet, October 25, 1928 (*S. Issiki*).

LIMONIA (ALEXANDRIARIA) ATAYAL sp. nov.

General coloration brown; præscutum obscure yellow with three brown stripes, the lateral stripes broad, reaching the lateral margins or nearly so; wings with a strong brownish suffusion; Sc long, Sc₁ ending almost opposite the origin of Rs, Sc₂ far from its tip; Rs longer than the basal section of R₄₊₅.

Female.—Length, about 4.2 millimeters; wing, 5.

Rostrum and palpi black. Antennæ black throughout. Head dark brown.

Mesonotal præscutum obscure brownish yellow, with three brown stripes, the median stripe entire; lateral stripes broad and diffuse; humeral region of sclerite brighter yellow; scutal lobes dark brown, the median area and disk of scutellum paler; remainder of mesonotum dark brown. Pleura obscure yellow, striped longitudinally with dark brown, including the ventral anepisternum and the ventral sternopleurite. Halteres infuscated, the base of the stem narrowly obscure yellow. Legs with the fore coxæ infuscated, the remaining coxæ and trochanters obscure yellow; remainder of legs broken. Wings (Plate 1, fig. 9) with a strong brown suffusion, the oval stigma very slightly darker; veins dark brown. Venation: Sc unusually long, Sc₁ ending just before the origin of Rs, Sc₂ far from its tip; Rs longer than the basal section of R₄₊₅; free tip of Sc₂ and R₂ in alignment, both pale; m-cu at fork of M, longer than the distal section of Cu₁.

Abdominal tergites dark brown; sternites paler brownish yellow. Ovipositor with the tergal valves long and straight, the tips obtuse.

Habitat.—Formosa.

Holotype, female, Shinten, April 15, 1928 (*S. Issiki*).

ORIMARGA FUSCIVENOSA sp. nov.

General coloration of head and thorax dark plumbeous; halteres and legs dark; wings with a faint brownish tinge, the veins brownish black, very conspicuous; R₂ and R₁₊₂ subequal; basal section of R₄₊₅ angulated before midlength.

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

Rostrum and palpi black. Antennæ black throughout. Head dark plumbeous gray.

Mesonotum and pleura entirely dark plumbeous gray. Halteres infuscated. Legs with the coxæ and trochanters dark brown; remainder of legs black. Wings (Plate 1, fig. 10) with a faint brownish tinge, the veins brownish black, very conspicuous; wing apex in radial field narrowly margined with brown;

costal vein incrassated; costal fringe relatively long and conspicuous. Macrotrichia of medial field beyond cord long and conspicuous. Venation: Sc_1 ending about opposite midlength of R_s , Sc_2 near its tip; free tip of Sc_2 nearly three times its length before R_2 ; R_2 subequal to R_{1+2} ; basal section of R_{4+5} angulated and weakly spurred before midlength; r-m distal of level of R_2 ; petiole of cell M_3 short; m-cu about opposite one-fifth the length of R_s ; vein 2d A produced, the cell narrowed and acute at outer end.

Abdominal tergites dark brown, the sternites a little paler; hypopygium black.

Habitat.—Formosa.

Holotype, male, Shinten, April 15, 1928 (*S. Issiki*).

Orimarga fuscivenosa is most closely allied to *O. taiwanensis* Alexander, likewise from Formosa, differing in the uniform dark plumbeous gray coloration, including the thoracic pleura, and the very dark wing veins, which are provided with long conspicuous macrotrichia. The details of venation are similarly distinct, including the position of Sc_2 , the distinctness of the free tip of Sc_2 , the longer R_s , with cell R_1 relatively longer and narrower, and the more-pointed 2d anal cell.

Genus THAUMASTOPTERA Mik

Thaumastoptera MIK, Verh. zool.-bot. Ges. Wien 16 (1866) 302.

The genus *Thaumastoptera* was proposed for the single species, *calceata* Mik, now known to be widely distributed in Europe. The only other described species are the Oligocene *T. electra* Alexander, from the Baltic amber, and *T. undulata* (Cockerell and Haines), from the Gurnet Bay deposits. It is thus a matter of great interest to record a species of the genus from the high mountains of Formosa. The presence of three supernumerary crossveins in the wings of the new species requires the formation of a new subgeneric group that is described below as *Taiwanita*. This venational condition would appear closely to parallel that found in *Limonia* and its subgenus *Discobola* Osten Sacken. The supernumerary and other transverse elements in the wing of *Taiwanita* (Plate 1, fig. 11) form an irregular cordlike arrangement lying proximad of the true cord, these crossveins and deflections being Sc_2 , the basal section of R_s , the supernumerary crossvein in cell R, the m-cu crossvein, and the supernumerary crossveins in cells Cu and 1st A. It should be noted that a supernumerary crossvein in cell Cu is not known in any other crane fly. The members of the genus *Thaumastoptera* are peculiar in the

habits of the larvæ, which live in cold springs and construct a portable case.²

Subgenus TAIWANITA novum

Characters as in typical *Thaumastoptera*, differing especially in the venation. Supernumerary crossveins in cells R, Cu, and 1st A.

Type of the subgenus, *Thaumastoptera (Taiwanita) issikiana* sp. nov. (Eastern Palearctic Region).

THAUMASTOPTERA (TAIWANITA) ISSIKIANA sp. nov.

General coloration grayish white; antennæ with the basal segments infuscated, the outer segments paling to yellow; legs yellow, the femoral tips conspicuously blackened; wings pale yellow, variegated with brown areas on the crossveins and deflections and numerous gray dots in the cells; supernumerary crossveins in cell R, Cu, and 1st A.

Male.—Length, about 4 millimeters; wing, 5.

Rostrum obscure brownish yellow; maxillary palpi black. Antennæ with the scapal segments brownish testaceous; basal segments of flagellum infuscated, the outer segments passing into yellow; basal flagellar segments oval, the outer segments more elongated; all segments with long powerful setæ that exceed the segments in length. Head pale grayish white.

Mesonotum pale grayish white, without markings, the lateral portions of the præscutum more yellowish; posterior mediotergite a little infuscated. Pleura pale yellow, with a dusky cloud on the dorsopleural region. Halteres white. Legs with the coxæ and trochanters pale yellow; femora yellow, the tips conspicuously blackened, preceded by a narrow more whitish ring; remainder of legs pale yellow. Wings (Plate 1, fig. 11) pale yellow, handsomely variegated with dark brown seams on the veins and numerous pale gray dots in the cells; the darker seams include the arculus, origin of R_s , all crossveins and deflections of veins, tips of Sc_1 , and all longitudinal veins; the gray dots occur in all cells; veins pale yellow, darker in the seamed areas. Venation: Sc long, Sc_1 ending about opposite three-fourths the length of R_s , Sc_2 just before the origin of the latter; R_s angulated, with a supernumerary crossvein at the angulation, connecting posteriorly with M ; R_2 in transverse alignment with R_{1+2} ; inner end of cell R_3 lying a little proximad of cell 1st M_2 ; m-cu nearly twice its length before the fork of M ; a supernumerary

² Lenz, Fr., *Thaumastoptera calceata* Mik, eine gehäusetragende Tipulidenlarve, Archiv für Naturgeschichte 85, Abt. A., Heft 4 for 1919 (1920) 114-136, figs. 1-28.

crossvein in cell Cu at near midlength, this completely traversing vein Cu₂; a supernumerary crossvein in cell 1st A, connecting with vein 2d at near two-thirds its length.

Abdomen pale yellow, the pleural region more darkened. Male hypopygium (Plate 2, fig. 29) with the dististyle, *d*, single, as in the genus, appearing as a flattened blade, the apex produced into a slender acute point, the outer margin with a small appressed tooth.

Habitat.—Formosa.

Holotype, male, Shōrei, altitude 7,000 to 8,000 feet, October 25, 1928 (*S. Issiki*).

HELIUS (HELIUS) NAWAIANUS sp. nov.

Mesonotum reddish yellow, the cephalic half of the præscutum with a dark brown median stripe; antennæ (male) relatively long, about twice as long as the combined head and rostrum; abdomen dark brown, the hypopygium yellow; male hypopygium with the outer dististyle terminating in two obtuse spines, the outer margin with three long powerful setæ.

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

Female.—Length, about 8.5 millimeters; wing, 7.8.

Rostrum and palpi dark brown. Antennæ relatively elongated, as in *H. nipponensis*, about twice as long as the combined head and rostrum, dark brown; flagellar segments cylindrical, with a dense white pubescence and short scattered black verticils. Head gray.

Pronotum dark brown medially, paler laterally. Mesonotum reddish yellow, the cephalic half of the præscutum with a dark brown median stripe, the remainder of the notum unmarked. Pleura reddish yellow. Halteres pale. Legs with the coxæ and trochanters concolorous with the pleura; femora obscure yellow, the tips narrowly infuscated; tibiæ brownish yellow, the tips vaguely darkened; tarsi passing into brownish black beyond bases. Wings with a very pale brownish tinge, the stigma only slightly darker; veins dark brown. Venation: Sc₁ ending just before the fork of Rs, Sc₂ at its tip; Rs nearly straight; cell 1st M₂ large, the proximal end wider; m-cu close to the fork of M.

Abdomen dark brown, the basal sternites a very little paler; hypopygium and subterminal segments yellow. Male hypopygium with the outer dististyle, *od* (Plate 2, fig. 30), ending in two subequal blackened knobs, or obtuse spines, not produced into a long apical spine as in *H. nipponensis* (Plate 2, fig. 31); on outer margin before apex with three long powerful setæ that

are entirely lacking in *nipponensis*, *brevioricornis*, and allied forms.

Habitat.—Japan (Honshiu).

Holotype, male, Ōi, Gifu, June 6, 1923 (*R. Takahashi*). Allotopotype, female.

Helius nawaianus is named in honor of the great pioneer entomologist of Japan. In *H. nipponensis* Alexander the præscutum has three distinct stripes, the centers of the scutal lobes are blackened, and the abdomen is much paler.

HELIUS (HELIUS) LILIPUTANUS sp. nov.

Size very small (wing, male, under 3.5 millimeters); rostrum elongated; thorax ochreous yellow; wings grayish subhyaline, without a distinct stigma; Sc short; cell M₂ open by the atrophy of m; abdominal segments conspicuously bicolorous.

Male.—Length, excluding rostrum, about 3 millimeters; wing, 3.2; rostrum, about 1.1.

Rostrum elongated, dark brown, exceeding the combined head and thorax. Antennæ brownish black, with only fifteen apparent segments; first flagellar segment large; terminal segment reduced to a tiny button; verticils long and conspicuous, much exceeding the segments, more elongate on the outer segments. Head pale, the anterior vertex narrow.

Thorax pale ochreous yellow, the mesonotum somewhat darker behind; sternopleurite slightly infuscated. Halteres dark brown, the base of the stem narrowly pale. Legs with the coxæ and trochanters pale yellow, those of the fore legs somewhat darker; remainder of legs broken. Wings (Plate 1, fig. 12) grayish subhyaline, the stigma scarcely darkened; wing margin in radial field narrowly and vaguely seamed with brown; veins pale brown. Venation: Sc short, Sc₁ ending about opposite midlength of the short Rs, Sc₂ at its tip; veins R₃ and R₄₊₅ at wing margin widely divergent, cell R₃ being unusually wide; cell M₂ open by the atrophy of m; m-cu nearly its own length beyond the fork of M, longer than the distal section of Cu₁; cell 2d A narrow.

Abdominal segments conspicuously bicolorous, the bases broadly obscure yellow, the slightly narrower apical portions dark brown; subterminal segments uniformly darkened, forming a ring; hypopygium chiefly pale. Male hypopygium (Plate 2, fig. 32) with a conspicuous interbasal rod, *i*. Outer dististyle, *od*, slender, bifid at apex, the outer tooth broken near base in the unique type.

Habitat.—Formosa.

Holotype, male, Michishita, altitude 4,000 feet, July 31, 1928 (*S. Issiki*).

The structure of the outer dististyle is generally similar to *Taiwanina pandoxa* Alexander, and it is very possible that the latter genus is more correctly placed near *Helius* despite the reduced palpi, peculiar antennal structure, and shape of the thorax.

HEXATOMINI

ULA SUPERELEGANS sp. nov.

General coloration black, pruinose; antennæ elongate; wings yellowish, with a heavy brown pattern, including a large area surrounding Sc_2 ; stigma yellow, both ends darkened; abdominal tergites black, the caudal margins narrowly ringed with obscure yellow; sternites dark, the incisures broadly yellow.

Female.—Length, about 6.5 to 7 millimeters; wing, 7 to 8.

Rostrum and palpi black. Antennæ elongate, in female, if bent backward, extending to some distance beyond the wing root; scapal segments obscure yellow, the flagellum black; flagellar segments fusiform, with long conspicuous verticils. Head brownish gray.

Mesonotum black with a conspicuous brownish yellow pollen, the scutellum and postnotum somewhat more pruinose. Pleura black, sparsely pruinose; dorsopleural membrane dusky. Halteres dusky, the basal half of the stem yellow, the knobs more infuscated. Legs with the coxæ brownish yellow, paler apically; trochanters obscure brownish yellow; femora brownish black, the bases obscure yellow, more broadly so on the posterior legs; tibiæ yellowish brown to brownish black, the tips still darker; tarsi passing into black. Wings with a yellowish color, variegated with a very heavy brown pattern, including extensive seams at Sc_2 , origin of Rs, along the cord from the costa at Sc_1 to Cu; outer end of stigma surrounding R_2 and R_{1+2} ; outer end of cell 1st M_2 ; narrower dusky clouds at wing apex, as marginal areas at ends of radial veins and as a conspicuous seam for almost the whole length of the distal section of Cu; stigma chiefly yellow, brighter than the ground color; veins dark brown. The holotype has an additional small linear dark seam in cell 1st A. Macrotrichia of cells nearly lacking in the proximal ends of the basal cells, including nearly the basal half of 2d A. Venation: Rs angulated at origin, forking at r-m; m-cu nearly in alignment with r-m.

Abdominal tergites black, the segments narrowly ringed caudally with obscure testaceous yellow; sternites similar, the inci-

tures broadly and conspicuously obscure yellow, this including both the bases and apices of the segments; subterminal segments more uniformly blackened. Ovipositor with the base of the genital segment infuscated, the remainder brownish yellow; tergal valves strongly upcurved to the very acute tips, the dorsal margin at base with a low obtuse darkened tooth.

Habitat.—Formosa.

Holotype, female, Shōri, altitude 7,000 to 8,000 feet, October 25, 1928 (*S. Issiki*). Paratopotype, female.

Ula superelegans sp. nov. and *U. fuscistigma* sp. nov. are distinct from the two species known from northern Japan, *Ula perelegans* Alexander and *U. cincta* Alexander.

ULA FUSCISTIGMA sp. nov.

General coloration black, pruinose; antennæ elongate; wings grayish, the stigma uniformly brown; large subcircular brown clouds at origin of Rs and on anterior cord; abdomen uniformly darkened.

Female.—Length, about 7 millimeters; wing, 7.2.

Rostrum and palpi black. Antennæ (female) elongate; scape dark brown, the flagellum black. Head dark gray.

Thorax black, the mesonotum sparsely pruinose, the scutellum and postnotum more heavily so. Pleura conspicuously pruinose, especially the ventral pleurites; dorso pleural region dark. Halteres pale, the knobs dark brown. Legs with the coxæ dark brown, the trochanters more brownish yellow; femora brownish yellow, passing into black; remainder of legs black. Wings (Plate 1, fig. 13) grayish, the stigma uniformly darkened; conspicuous subcircular brown clouds at origin of Rs and on anterior cord; narrower seams on posterior cord and outer end of cell 1st M_2 ; a tiny brown seam on Sc_2 ; veins dark brown. Macrotrichia of cells lacking only at extreme wing base, including about the basal third of cell 2d A. Venation: Rs forking just beyond r-m; R_{1+2} a trifle longer than R_2 alone; cell 1st M_2 relatively small.

Abdominal tergites black, the sternites a little paler, the pleural membrane dark; ovipositor yellowish horn-color, the tergal valves relatively broad, upcurved to the acute tips.

Habitat.—Formosa.

Holotype, female, Shōri, altitude 7,000 to 8,000 feet, October 25, 1928 (*S. Issiki*).

PSEUDOLIMNOPHILA AUTUMNALIS sp. nov.

General coloration gray, the præscutum with four narrow brown stripes; antennæ black, the base of the first flagellar seg-

ment yellow; legs chiefly brown, the tarsi passing into black; wings with a grayish brown suffusion, the percular and costal regions more yellowish; stigma and a vague pattern on the disk darker; distal section of Cu_1 straight; male hypopygium with the $\text{\ae}deagus$ short.

Male.—Length, about 8 millimeters; wing, 9.3.

Female.—Length, about 7 millimeters; wing, 8.2.

Rostrum brown, the palpi darker brown. Antennae (male) relatively short, if bent backward, extending to just beyond the wing root; antennae black, the basal third of the first flagellar segment yellow; flagellar segments subcylindrical, with verticils that exceed the segments. Head brownish gray, clearer gray in front.

Pronotum gray, the lateral portions of the scutellum obscure yellow. Mesonotal $\text{\pr}\text{\ae}scutum$ gray with four brown stripes, the intermediate pair separated by a capillary gray line; pseudo-sutural foveae small, black; no tuberculate pits; remainder of mesonotum gray, the scutal lobes variegated with brown. Pleura gray. Halteres dusky, the base of the stem narrowly pale; in the paratype, the apices of the knobs slightly paler. Legs with the coxae brownish gray basally, the apices pale; trochanters obscure yellow, margined with brown; femora brownish yellow, paler basally, the tips passing into dark brown; tibiae and tarsi dark brown, the latter passing into black. Wings (Plate 1, fig. 14) with a grayish brown suffusion, the prearcular and costal regions more yellowish; stigma darker; very vague and diffuse clouds at origin of R_s , along cord and outer end of cell 1st M_2 ; axillary region darkened; veins dark brown. Macrotrichia of veins unusually long and conspicuous; costal fringe short in both sexes. Venation: Sc_1 ending about opposite r-m, Sc_2 at its tip; R_s angulated at origin; R_{2+3+4} relatively long, gently arcuated, longer than R_{2+3} ; R_2 subequal to R_{1+2} ; cell 1st M_2 short, m-cu at near two-thirds its length; cell M_1 deep, its petiole subequal to or shorter than m-cu; distal section of Cu_1 straight; vein 2d A long, gently sinuous.

Abdominal tergites dark brown, the central portion more yellowish to produce a more or less distinct dorsomedian vitta; subterminal segments and hypopygium entirely blackened; sternites infuscated, the intermediate segments with a large yellowish triangle on posterior half, the point directed cephalad. Male hypopygium (Plate 2, fig. 33) with the tergite, 9t, deeply notched. Basistyle short and broad. Outer dististyle, *od*, narrowed to the simple apex, the outer surface setiferous. Inner

dististyle with the basal half enlarged, the outer margin with numerous conspicuous erect setae, the apical point elongate. $\text{\AE}deagus$ short. What appears to represent an interbasal process appears as a trispinous structure, as figured.

Habitat.—Formosa.

Holotype, male, Mareppa, altitude 6,000 feet, October 25, 1928 (*S. Issiki*). Allotype, female, Shōrei, altitude 7,000 to 8,000 feet, October 25, 1928 (*S. Issiki*). Paratopotype, male.

The only similar grayish *Pseudolimnophila* from this general region is *P. horii* Alexander (Japan), which differs in the general coloration of the body and wings, the yellow halteres, the venation, as the strongly curved distal section of Cu_1 , and the structure of the male hypopygium.

TROGLOPHILA RITZOANENSIS sp. nov.

General coloration brown, the humeral region of the $\text{\pr}\text{\ae}scutum$ more yellowish; head brownish gray; wings with a brown tinge; R_s and R_{2+3+4} subequal, the former slightly more arcuated; m-cu just before the fork of M.

Female.—Length, about 3.5 millimeters; wing, 4.6.

Rostrum and palpi pale brown. Antennae (female) of moderate length only, if bent backward extending about to the wing root; antennae dark brown. Head brownish gray.

Mesonotum brown, the humeral region of $\text{\pr}\text{\ae}scutum$ more yellowish. Pleura brown. Halteres dusky, the base of the stem narrowly yellow. Legs with the coxae brownish testaceous, the posterior coxae paler; remainder of legs pale brown, the setae dark. Wings (Plate 1, fig. 15) with a faint brownish tinge, the stigma scarcely darker; veins and macrotrichia dark brown. Venation: Sc relatively long, Sc_1 ending just beyond r-m, Sc_2 a short distance from the tip of Sc_1 ; R_s relatively short, arcuated, subequal to or slightly longer than the more gently arcuated R_{2+3+4} ; R_2 very faint, R_{2+3} nearly as long as R_{1+2} , the latter less than one-half $R_1 + Sc_2$; m-cu shortly before the fork of M.

Abdomen uniform brown, the sternites a little paler. Ovipositor with the valves fleshy, terminating in a slender pale setoid structure.

The left wing of the type has cell M_1 present as a small areole that is less than one-fifth the length of the petiole.

Habitat.—Formosa.

Holotype, female, Ritozan, altitude 5,000 feet, August 1, 1928 (*S. Issiki*).

Troglophila ritozanensis is most closely allied to *T. alticola* (Edwards), of Borneo. It cannot be stated whether the condi-

tion of having cell M_1 preserved is normal, the venation of the two wings of the type being conspicuously unlike.

LIMNOPHILA (TRICHO-LIMNOPHILA) CÆSIELLA sp. nov.

Male.—Length, 7.5 to 8 millimeters; wing, 7 to 7.5.

Closely allied and generally similar to *L. (T.) pilifer* Alexander, differing in the slightly longer antennæ and details of coloration.

Rostrum and head light gray. Antennæ longer than in *L. pilifer*, if bent backward extending approximately to the root of the halteres, pale brown. Mesothorax entirely gray, the præscutal stripes scarcely evident, the pruinosity including the entire præscutum. Male hypopygium with the lobes of the tergite long and more expanded at apices, the notch inclosed thus more or less narrowed at outer end.

Habitat.—Japan (Kiushiu).

Holotype, male, Hirao Hill, near Fukuoka, April 5, 1924 (*H. Hori*). Paratopotypes, 1 male, with type; 2 males, Fukuoka, April 13, 1924 (*H. Hori*).

The specimens of the rather extensive series of *L. pilifer* before me all show the cephalic portion of the median præscutal stripe highly polished and shiny black.

LIMNOPHILA RANTAIZANA sp. nov.

General coloration brownish yellow; antennæ (male) short; wings brownish yellow, with a weak dark pattern; macrotrichia of veins long and conspicuous; inner ends of cells R_4 , R_5 , and 1st M_2 in oblique alignment; male hypopygium with the median region of the tergite produced caudad into a bilobed rod.

Male.—Length, about 5.5 millimeters; wing, 6.8.

Rostrum yellow; palpi dark brown. Antennæ (male) short, if bent backward extending to opposite or just beyond the wing root; pale brownish yellow, the outer segments somewhat darker; flagellar segments long-oval, with a dense pale pubescence and verticils that slightly exceed the segments. Head grayish ochreous, the center of the broad vertex a little darkened.

General coloration of the thorax brownish yellow, subnitidous, without evident markings; pseudosutural foveæ concolorous with the præscutum; no tuberculate pits. Pleura testaceous yellow. Halteres relatively long and slender, obscure yellow, the knobs more darkened. Legs with the coxæ and trochanters pale yellow; femora brownish yellow, a little darkened outwardly; tibiæ and tarsi pale brown, the outer tarsal segments somewhat darker; legs conspicuously hairy. Wings (Plate 1, fig. 16) with a strong

brownish yellow tinge; stigma oval, darker brown, very vague and restricted; dark seams on anterior cord; veins brown, the macrotrichia long and conspicuous. Venation: Sc_1 ending just before the fork of R_s , Sc_2 a short distance from its tip; R_s long and gently arcuated; R_{2+3+4} short, less than the basal section of R_5 , R_2 pale, R_{3+2} subequal to R_{1+2} ; inner ends of cells R_4 , R_5 , and 1st M_2 in oblique alignment, the last-named most proximal; cell M_1 deep, about one-half longer than its petiole; cell 1st M_2 small, m-cu beyond midlength; anterior arculus present.

Abdomen pale brown, the sternites somewhat paler. Male hypopygium (Plate 2, fig. 34) with the tergite, 9t, produced medially into a narrow rod, the apex bilobed. Basistyle, *b*, relatively short and stout, the interbasal process small, pale, appearing as an obtuse blade. Outer dististyle, *od*, a narrow rod, the apex unequally bidentate. Inner dististyle, *id*, very small, pale, setiferous, the lower or cephalic margin before midlength bearing two or three more powerful setæ from tuberculate bases. Ædeagus long and slender, pale, the apex apparently broken in the unique type. Gonapophyses, *g*, appearing as slender hooks, narrowed to the acute tips.

Habitat.—Formosa.

Holotype, male, Rantaizan, altitude 6,000 to 7,000 feet, May 21, 1928 (*S. Issiki*).

The structure of the ninth tergite and outer dististyle somewhat suggests members of the subgenus *Tricholimnophila*, but in other respects there is little in common between the groups.

PILARIA FORMOSICOLA sp. nov.

General coloration shiny dark brown, the pleura more brownish yellow; wings with a strong brown tinge, the stigma darker; R_2 just before the fork of R_{3+4} ; cell M_1 present; m-cu at about two-thirds the length of cell 1st M_2 ; abdominal tergites uniformly blackened, the sternites yellowish brown.

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

Rostrum and palpi dark brown. Antennæ (female) relatively elongate, if bent backward extending about to the root of the halteres; antennæ black throughout; flagellar segments elongate, with long conspicuous verticils, the dorsal, unilaterally arranged series much exceeding the segments in length. Head dark brown.

Mesonotum shiny dark brown, the pleura more brownish yellow. Halteres relatively elongate, dusky, especially the knobs. Legs with the coxæ and trochanters yellow; remainder of legs black, the femoral basés vaguely brightened. Wings (Plate 1,

fig. 17) with a strong brownish tinge, the oval stigma darker brown; veins dark brown. Venation: Sc_1 ending some distance before the fork of R_s , Sc_2 at its tip; R_s angulated and weakly spurred at origin; R_2 oblique, just before the fork of R_{3+4} ; inner ends of cells R_1 , R_5 , and 1st M_2 in oblique alignment; cell M_1 longer than its petiole; m-cu at about two-thirds the length of cell 1st M_2 ; vein 2d A elongate.

Abdominal tergites black, the sternites yellowish brown. Ovipositor with the valves very elongate; tergal valves dark basally, the tips paling to yellow; sternal valves yellow, the bases more narrowly blackened.

Habitat.—Formosa.

Holotype, female, Sorempi, near Giran, altitude 1,500 feet, November 4, 1928 (*S. Issiki*).

ERIOPTERINI

CLADURA DECEM-NOTATA Alexander.

Cladura decem-notata ALEXANDER, Ann. Ent. Soc. America 17 (1924) 436-437.

This interesting species was described from various stations in Kiushiu, Japan. In the present series of Tipulidæ from Professor Issiki were a few males of what appears to be the same species from Shorei, Formosa, altitude 7,000 to 8,000 feet, October 25, 1928. The type series was represented only by females, while the present material includes only males. The Formosan material shows slight differences, chiefly in the size and intensity of the black body markings, and it is possible that they may represent a distinct but closely allied species.

NEOLIMNOPHILA ALTICOLA sp. nov.

General coloration gray; mesonotal præscutum with the cephalic ends of the intermediate and lateral stripes shiny polished black; legs black; wings grayish, the prearcular region yellowish; stigma a little darker than the ground color; male hypopygium with the basistyle having a single curved spinous bristle near base.

Male.—Length, 6.5 to 7 millimeters; wing, 7 to 8.

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

Rostrum dark gray; palpi black. Antennæ black throughout; fusion segment elongate-conical, composed of four subsegments, the sutures between indicated; segments beyond the fusion subcylindrical, gradually increasing in length to the antepenultimate, the remainder shorter. Head brownish gray, the front and restricted posterior orbits clearer gray.

Mesonotal præscutum yellowish gray with four brown stripes, the cephalic end of the intermediate pair and of each lateral stripe polished black; posterior sclerites of mesonotum clearer gray. Pleura gray. Halteres pale, the knobs weakly dusky. Legs with the coxæ gray; trochanters yellowish brown; remainder of legs black, the femoral bases very narrowly and restrictedly obscure yellow. Wings (Plate 1, fig. 18) with a grayish suffusion, the oval stigma only a little darker than the ground color; prearcular region conspicuously yellow; veins brown. Venation: Sc_1 ending about opposite the fork of R_s , Sc_2 at its tip; R_{2+3+4} elongate; R_2 variable in position, in most instances about its own length beyond the fork of R_{2+3+4} ; cell 1st M , small; cell M_1 subequal to or slightly longer than its petiole; m-cu variable in position, from close to the fork of M to opposite two-fifths the length of cell 1st M_2 .

Abdomen, including the hypopygium, black, sparsely pruinose. Male hypopygium (Plate 2, fig. 35) with the basistyle, *b*, long and slender, at base with a single long curved spinous bristle. Outer dististyle, *od*, long and slender, curved, the apex narrowed and arched, the outer margin with appressed denticles that are somewhat more erect and conspicuous just before the apex. Inner dististyle with conspicuous setæ.

Habitat.—Formosa.

Holotype, male, Shirasetsu, altitude 6,000 feet, October 24, 1928 (*S. Issiki*). Allotype, female, Shōrei, altitude 7,000 to 8,000 feet, October 25, 1928 (*S. Issiki*). Paratopotypes, 5 males, 1 female; paratypes, 1 male, 1 female, with the allotype.

Neolimnophila alticola is amply distinct from the other species known from eastern and southern Asia; namely, *N. ultima* (Osten Sacken), *N. genitalis* (Brunetti) (equals *simplex* Brunetti), and *N. fuscinervis* Edwards.

LIPSOTHRIX PLUTO sp. nov.

General coloration shiny coal-black; antennæ (male) elongate; legs black, only the extreme bases of the femora obscure yellow; wings with a strong dusky tinge, the oval stigma darker.

Male.—Length, about 7.5 millimeters; wing, 8.5; antennæ, about 3.3.

Rostrum and palpi black. Antennæ (male) elongate, black throughout; flagellar segments cylindrical with verticils that are shorter than the segments; flagellar segments gradually decreasing in length outwardly, the terminal segment abruptly smaller, subglobular. Head dull black.

Thorax shiny coal-black, the anterior lateral pretergites very restrictedly obscure yellow; dorsopleural membrane black. Halteres dirty white, the knobs infumed. Legs with the coxæ and trochanters yellow; femora black, the extreme bases obscure yellow; remainder of legs black. Wings (Plate 1, fig. 19) with a strong dusky tinge, the oval stigma darker brown; veins black, with long conspicuous macrotrichia, especially on the veins beyond origin of Rs. Venation: Sc_1 ending about opposite one-third the length of R_{2+3+4} , Sc_2 at its tip; Rs long, nearly straight; R_{2+3+4} a little shorter than R_{2+3} ; R_2 equal to R_{1+2} ; m-cu about one-half its length beyond the fork of M.

Abdomen black, the hypopygium a very little paler. Male hypopygium with the basistyles relatively stout, the interbasal process pale yellow, bladeliike, narrowed to the acute tip. Outer dististyle entirely blackened, the apical spine much larger than the subterminal appressed tooth. Inner dististyle more elongate, the distal half slender, tufted apically with long stout setæ.

Habitat.—Formosa.

Holotype, male, Shōrei, altitude 7,000 to 8,000 feet, October 25, 1928 (*S. Issiki*).

Lipsothrix pluto is a striking species of the genus, very distinct from the only other regional member of the group.

GNOPHOMYIA DEJECTA sp. nov.

General coloration plumbeous black; antennæ relatively elongate, flagellar segments cylindrical; halteres and legs dark brown; wings with a faint brown suffusion, the stigma scarcely darker; Rs in alignment with R_5 ; cell 1st M_2 relatively elongate, exceeding vein M_4 beyond it; m-cu shortly before midlength of the cell; male hypopygium with the tergite subquadrate, its caudal margin with a U-shaped emargination; outer dististyle a simple glabrous rod.

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

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

Rostrum and palpi black. Antennæ relatively elongate, black throughout; flagellar segments (male) cylindrical, the outer segments gradually decreasing in length, the terminal segment about two-thirds the penultimate; verticils shorter than the segments. Head brownish black.

Thorax plumbeous black, the posterior sclerites of the pleura somewhat paler; dorsopleural region paler; anterior lateral pretergites restrictedly light yellow. Halteres dark brown, the base of the stem narrowly paler. Legs dark brown. Wings (Plate 1, fig. 20) with a faint brown suffusion, the stigma

scarcely darker; veins dark brown. Macrotrichia of veins of moderate length only. Venation: Sc_1 ending just before R_2 , Sc_2 about opposite one-third the length of R_{2+3+4} ; Rs in alignment with R_5 ; r-m at fork of Rs; cell 1st M_2 relatively long exceeding vein M_4 beyond it, m-cu shortly before midlength.

Abdomen dark brown, the hypopygium black. Male hypopygium (Plate 2, fig. 36) small. Ninth tergite 9t, small, subquadrate, the caudal margin with a conspicuous U-shaped emargination, the sublateral lobes thus formed acute. Basistyle, b, with the mesal margin produced into a short acute black spine. Outer dististyle, od, a simple, slender, entirely glabrous rod arising from an expanded base. Inner dististyle shorter, strongly arcuated, the surface with several stout spinous setæ, the apex a little expanded, blackened, glabrous. Ovipositor with the tergal valves relatively short and high, the basal half wider, the distal half slightly upturned, narrowed to the subacute tip.

Habitat.—Formosa.

Holotype, male, Taihoku, April 20, 1922 (*K. Takeuchi*).

Allotype, female, Hokuto, near Taihoku, February 10, 1928 (*S. Issiki*).

Gnophomyia dejecta is allied to *G. orientalis* de Meijere, differing in the larger size and details of coloration.

GNOPHOMYIA BREVICELLULA Alexander.

Gnophomyia brevicellula ALEXANDER, Philip. Journ. Sci. 22 (1923) 472-473.

The type, a unique male, was taken at Tattaka, Formosa, altitude 7,400 feet, August 16, 1921, by Teiso Esaki. A second male specimen is now on hand, collected at Chikurin, Formosa, altitude 3,000 feet, July 3, 1928, by Syuti Issiki.

The wing venation has not been figured and is shown herewith (Plate 1, fig. 21). The male hypopygium exhibits a rather remarkable structure of what seems to be ninth tergite (Plate 2, fig. 37). This supposed tergite, 9t, appears as a somewhat lyriform structure, the long divergent arms being gradually widened to shortly before the tips, thence narrowed to the acute points. In the holotype, as figured, the arms are slightly shorter and broader than in the more recently discovered specimen. Outer dististyle, od, a long slender arm, the tip obtusely rounded. Inner dististyle, id, expanded at base, the curved apical portion with flattened peglike setæ.

TRENTÉPOHLIA (MONGOMA) ATAYAL sp. nov.

Size small (wing, male, 5 millimeters); antennal verticils short; mesonotum dark brown, the præscutum brownish yellow with a conspicuous dark brown median stripe; legs pale; wings with a grayish tinge, almost unmarked except for the stigma and an apical clouding; apical fusion of Cu_1 and 1st A slight.

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

Rostrum and palpi dark. Antennæ brown throughout, of moderate length; flagellar segments cylindrical, with short verticils. Head blackish gray, carinate medially.

Mesonotal præscutum brownish yellow, with a conspicuous dark brown median stripe that is slightly wider behind; scutum similarly pale, the centers of the lobes extensively dark brown; scutellum and postnotum dark brown. Pleura uniformly dark brown. Halteres short, dark brown, the base of the stem restrictedly pale. Legs with the fore coxæ darkened, the remaining coxæ paler; trochanters yellow; remainder of legs pale brownish yellow, without clearly defined pattern, the tarsi passing into darker; no especial armature on legs other than two elongate setæ at tips of femora. Wings (Plate 1, fig. 22) with a grayish tinge, the prearcular region and cells C and Sc more yellowish; stigma elongate-oval, brown; wing apex narrowly and diffusely darkened; restricted brown seams along vein Cu and in cell 1st A at angulation of vein 2d A; veins brown. Venation: Rs subequal to R_{2+3+4} ; cell R_3 large; inner end of cell M_3 lying proximad of other cells beyond cell 1st M_2 ; m-cu at fork of M; fusion of Cu_1 and 1st A slight, about one-half m-cu; vein 2d A subangulate before midlength.

Abdomen brownish black, including the hypopygium, the central portions of the intermediate tergites paler.

Habitat.—Formosa.

Holotype, male, Inzan, near Giran, November 2, 1928 (*S. Issiki*).

Trentepohlia (*M.*) *atayal* is distinguished from allied small species of the subgenus by the combination of characters, as diagnosed above.

TRENTÉPOHLIA (MONGOMA) TARSALBA sp. nov.

General coloration dark brown, the posterior sclerites of the mesonotum and the pleura paler; legs black, the tarsi chiefly snowy white; wings grayish, variegated with brown seams, including vein Cu and the fused portion of Cu_1 and 1st A; veins Cu_1 and 1st A extensively fused before margin.

Female.—Length, about 5.5 millimeters; wing, 5.2.

Rostrum and palpi dark, the tips of the labial palpi yellow. Antennæ black throughout. Head black.

Mesonotum dark brown, the lateral margins of the præscutum and posterior sclerites of the notum more testaceous. Pleura testaceous, the dorsal pleurites darker. Halteres short, dusky. Legs with the coxæ and trochanters concolorous with the pleura, the fore coxæ somewhat darker; femora and tibiae black; basitarsi brown, paling to white at tips; remainder of tarsi snowy white, the terminal segment darkened. Wings (Plate 1, fig. 23) grayish, sparsely variegated with brown, including the elongate stigma; a longitudinal brown wash on vein Cu in cell M, beyond the fork of the vein continued along the fused $Cu_1 + 1st A$ to the wing margin; axillary region somewhat darkened; wing apex a little suffused; veins brown. Venation: Rs longer than the basal section of R_5 ; R_{2+3+4} very long, exceeding R_4 ; R_2 longer than R_{3+4} ; vein R_5 powerful, the medial veins beyond the fork of M weak and semievanescent; inner end of cell M_3 lying proximad of the others; fusion of Cu_1 and 1st A extensive, more than twice m-cu.

Abdomen black, the sternites somewhat paler. Ovipositor with relatively large and conspicuous valves, the tergal valves dark, strongly upcurved, the sternal valves high, yellow, dark at base.

Habitat.—Formosa.

Holotype, female, Giran, November 5, 1928 (*S. Issiki*).

The only described species of the subgenus *Mongoma* with a similar venation of the cubital and anal fields is *T. (M.) retracta* Edwards.

ORMOSIA SHOREANA sp. nov.

Size relatively large (wing, male, 6 millimeters); general coloration gray, the præscutum with a brown median stripe; femora obscure yellow with a broad brownish black subterminal ring; wings dusky, variegated with darker brown and pale areas; cell M_2 open by the atrophy of the basal section of M_3 ; vein 2d A strongly sinuous; male hypopygium with the dististyles subterminal in position, three in number, all simple.

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

Rostrum and palpi brownish black. Antennæ of moderate length; basal segments pale brown; flagellum black, the incisures restrictedly pale; flagellar segments gradually decreasing in size outwardly, with long, unilaterally arranged verticils. Head dark gray.

Pronotum brownish gray, the lateral pretergites yellow. Mesonotal præscutum brownish gray, with a brown median stripe and less evident lateral stripes; scutum gray, the centers of the lobes variegated with darker; scutellum and postnotum heavily pruinose. Pleura gray. Halteres with the basal half of the stem yellow, the distal half infuscated, the knobs paling to obscure yellow. Legs with the coxæ gray; trochanters obscure yellow; femora obscure yellow, with a broad brownish black subterminal ring, the tips narrowly yellow; tibiæ black, the extreme bases pale; tarsi black. Wings (Plate 1, fig. 24) with a strong dusky suffusion, the costal and stigmal regions darker brown; extensive paler areas, as follows: Before and beyond the origin of Rs, the latter extending cephalad into cell Sc₁; outer end of cell R and across the fork of M into the adjoining cells; axillary region pale; veins brown. Venation: Sc₁ ending just beyond R₂, Sc₂ opposite one-fifth the length of Rs; R₂ a trifle longer than R₂₊₃; cell M₂ open by the atrophy of the basal section of M₃; m-cu a little less than its own length before the fork of M; vein 2d A very strongly sinuous.

Abdomen, including the hypopygium, black, more or less pruinose. Male hypopygium (Plate 2, fig. 38) with the ninth tergite, 9t, apparently double as in this group of species, there being a paler and more fleshy structure beneath the true tergite, the latter profoundly bifid. Basistyle, *b*, produced slightly beyond the level of insertion of the dististyles. Dististyles, *d*, three, the outermost a glabrous earlike portion; longest style gently curved to the obtuse apex, the ventral margin with pale membrane set with tubercles; innermost style a slender curved rod, the tip acute or nearly so.

Habitat.—Formosa.

Holotype, male, Shōrei, altitude 7,000 to 8,000 feet, October 25, 1928 (*S. Issiki*).

All of the Formosan species of *Ormosia* known to me have this apparent duplication of the ninth tergite, there being a paler and thicker flattened structure immediately beneath the outer tergal plate.

ILLUSTRATIONS

[Legend; *b*, basistyle; *d*, dististyle; *dd*, dorsal dististyle; *g*, gonapophysis; *ī*, interbasal process; *id*, inner dististyle; *od*, outer dististyle; *t*, ninth tergite; *vd*, ventral dististyle.]

PLATE 1

- FIG. 1. *Nesopeza basistylata* sp. nov., venation.
 2. *Stibadocerella formosensis* sp. nov., venation.
 3. *Stibadocerella pristina* Brunetti, venation.
 4. *Cyttaromyia taiwania* sp. nov., venation.
 5. *Limonia (Limonia) tenuicula* sp. nov., venation.
 6. *Limonia (Dicranomyia) aurita* sp. nov., venation.
 7. *Limonia (Dicranomyia) montium* sp. nov., venation.
 8. *Limonia (Alexandriaria) atayal* sp. nov., venation.
 9. *Orimarga fuscivenosa* sp. nov., venation.
 10. *Thaumastoptera (Taiwanita) issikiana* sp. nov., venation.
 11. *Helius (Helius) liliputanus* sp. nov., venation.
 12. *Ula fuscistigma* sp. nov., venation.
 13. *Pseudolimnophila autumnalis* sp. nov., venation.
 14. *Troglyphila ritozanensis* sp. nov., venation.
 15. *Limnophila rantaizana* sp. nov., venation.
 16. *Pilaria formosicola* sp. nov., venation.
 17. *Neolimnophila alticola* sp. nov., venation.
 18. *Lipsothrix pluto* sp. nov., venation.
 19. *Gnophomyia dejecta* sp. nov., venation.
 20. *Gnophomyia brevicellula* Alexander, venation.
 21. *Trentepohlia (Mongoma) atayal* sp. nov., venation.
 22. *Trentepohlia (Mongoma) tarsalba* sp. nov., venation.
 23. *Ormosia shōreana* sp. nov., venation.

PLATE 2

- FIG. 25. *Nesopeza basistylata* sp. nov., male hypopygium.
 26. *Limonia (Limonia) tenuicula* sp. nov., male hypopygium.
 27. *Limonia (Dicranomyia) aurita* sp. nov., male hypopygium.
 28. *Limonia (Dicranomyia) montium* sp. nov., male hypopygium.
 29. *Thaumastoptera (Taiwanita) issikiana* sp. nov., male hypopygium.
 30. *Helius (Helius) nawaiianus* sp. nov., male hypopygium, dististyle.
 31. *Helius (Helius) nipponensis* Alexander, male hypopygium, dististyle.
 32. *Helius (Helius) liliputanus* sp. nov., male hypopygium.
 33. *Pseudolimnophila autumnalis* sp. nov., male hypopygium.
 34. *Limnophila rantaizana* sp. nov., male hypopygium.
 35. *Neolimnophila alticola* sp. nov., male hypopygium.
 36. *Gnophomyia dejecta* sp. nov., male hypopygium.
 37. *Gnophomyia brevicellula* Alexander, male hypopygium.
 38. *Ormosia shōreana* sp. nov., male hypopygium.

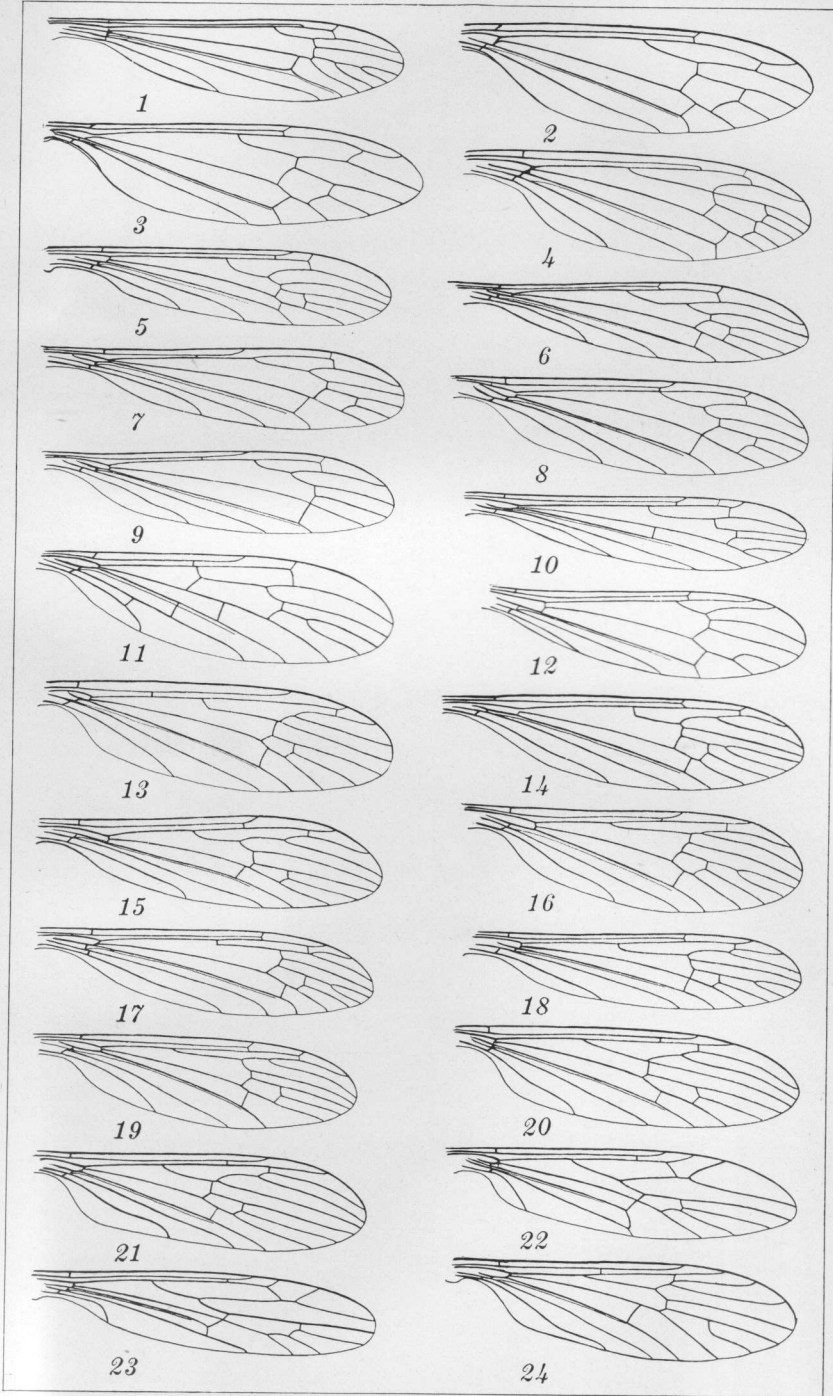


PLATE 1.

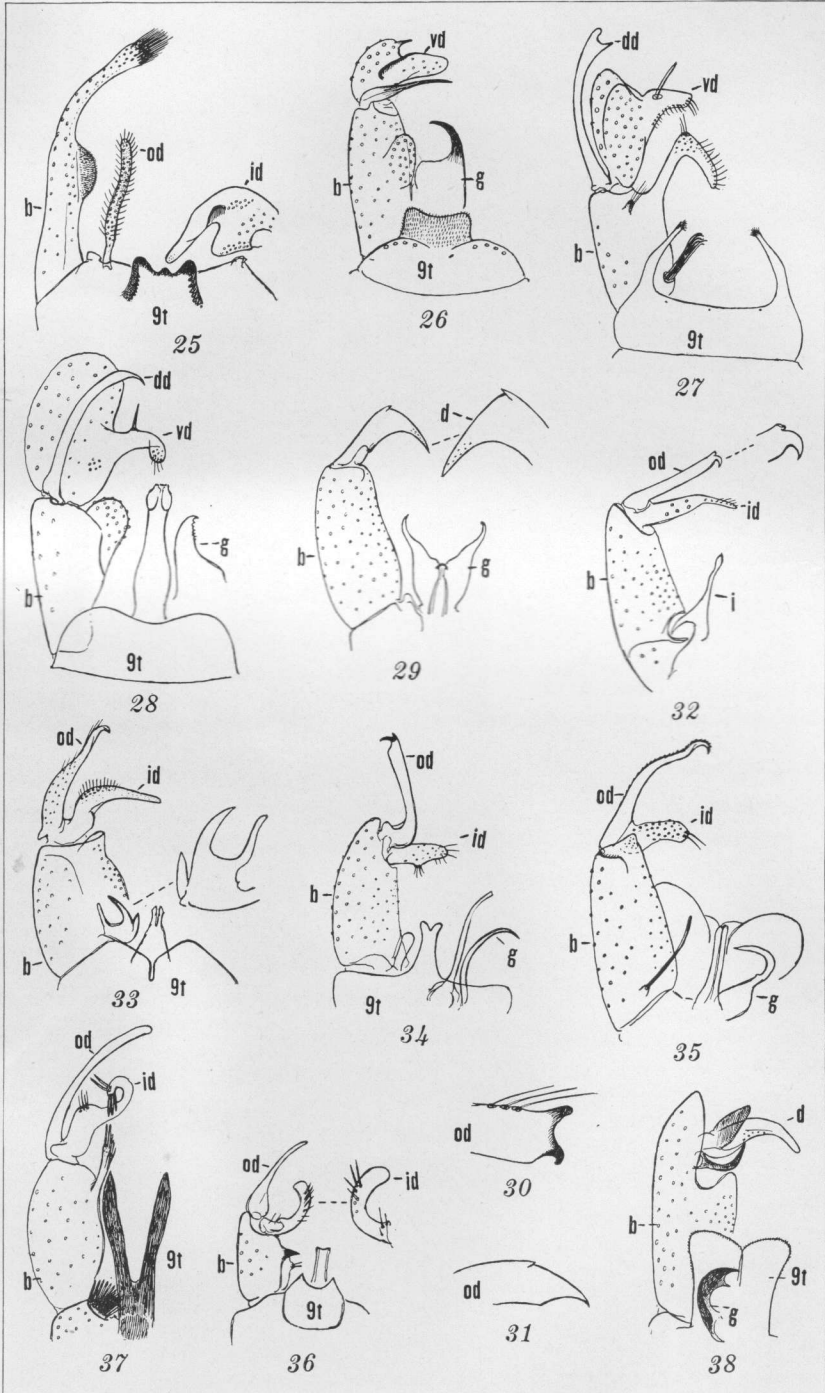


PLATE 2.