NEW OR LITTLE-KNOWN TIPULIDÆ FROM EASTERN ASIA (DIPTERA), III [1]

By CHARLES P. ALEXANDER

Of Amherst, Massachusetts

TWO PLATES

The crane flies discussed in the present report were taken chiefly at high altitudes in the mountains of Formosa by Prof. Syuti Issiki. Fewer were collected in Fukushimaken and Miyagiken, northeastern Honshiu, Japan, by Professor Issiki. This important series has added materially to our knowledge of the tipulid fauna of these two regions. I am including the single new species of *Paracladura* (Trichoceridæ) that was contained in this shipment. I am greatly indebted to Professor Issiki for the privilege of retaining the types of the novelties described at this time.

The venational innovations mentioned in the preceding part under this title [2] have now been discussed in detail in two recent papers.[3] Several leading students of venation in Australia and New Zealand, as Messrs. Mackerras, Nicholson, Tillyard, and Tonnoir, and the late Doctor Ferguson, have indicated (in litt.) their approval of the main principles of this modification of the radial field but have held that in certain groups (subfamilies Tipulinæ and Cylindrotominæ; tribes Limoniini and Lichriini of the Limoniinæ) these principles have been insufficiently applied. I now consider that this contention is correct, and the venation in the groups listed may be brought into conformity with the three tribes in the Limoniinæ (Pedicini, Hexatomini and Eriopterini) where it has been satisfactorily applied by making the following changes in the names of certain elements of the veins: Free tip of R_1 becomes free tip of Sc_2; r becomes R_1; R_2 becomes R_{1+2}.

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

[2] Philip. Journ. Sci. 35 (1928) 455–489.

[3] Proc. Linn. Soc. N. S. W. 52 (1927) 42–72, fig. 92; Rec. Ind. Mus. 29 (1927) 169–172, pl. 13.

TRICHOCERIDÆ

PARACLADURA CUNEATA sp. nov.

General coloration pale brown, the mesonotal præscutum with a dark brown median stripe; rostrum and scapal segments of antennæ yellow; wings nearly hyaline, cuneiformly narrowed at base; male hypopygium with the dististyle simple; gonapophyses appearing as pale flattened blades, each prolonged into a needlelike point.

Male.—Length, about 3.2 millimeters; wing, 4.

Female.—Length, about 3.8 millimeters; wing, 5.

Rostrum yellow; palpi dark brown. Antennæ setaceous, as in the family; scapal segments light yellow; flagellum dark brown. Head light brown.

Pronotum dark brown medially, paler laterally. Mesonotum pale brown, the præscutum with a dark brown median stripe; scutellum dark brown, the postnotum more testaceous brown. Pleura yellowish testaceous, with a diffuse brown dorsal stripe. Halteres relatively elongate, yellow, the knobs infuscated. Legs with the coxæ and trochanters yellowish testaceous; remainder of legs pale brownish yellow, the terminal tarsal segments darker; basistarsus more than three times as long as thick. Wings relatively narrow, the basal third cuneiformly narrowed, nearly hyaline; veins and macrotrichiæ brown. Venation (Plate 1, fig. 1): Vein $R_1 + Sc_2$ near its outer end and the basal portion of R_{1+2} arcuated toward costa; cell M_1 about one-half longer than its petiole; cell 1st M_2 very narrow; m-cu on M_4 shortly beyond its origin.

Abdominal tergites dark brown, the sternites and outer tergites somewhat brighter brown; subterminal segments dark brown; hypopygium brownish yellow. Male hypopygium (Plate 2, fig. 1) with the basistyles, *b*, short and stout; dististyle, *a*, simple, appearing as an elongate-cylindrical lobe, the mesal face except on the basal fourth with delicate retrorse setæ. Ædeagus double. Gonapophyses appearing as pale flattened blades, each prolonged into a needlelike point.

Habitat.—Formosa.

Holotype, male, Noko, altitude 9,000 feet, June 26, 1927 (*S. Issiki*). Allotopotype, female.

In the collections from Noko, altitude 8,000 feet on June 26, 1927, Professor Issiki included a second species of *Paracladura*, unfortunately represented only by the female sex. I suspect that this will prove to be *P. nipponensis* Alexander, described

from Kiushiu. There is no question that the higher mountains of Formosa support at least three species of this interesting genus.

TIPULIDÆ

TIPULINÆ

NESOPEZA TRICHOPYGA sp. nov.

General coloration of thorax dull brownish yellow; antennæ relatively long, flagellar segments elongate, the verticils relatively short; tarsi whitish; wings with a strong brownish tinge, the oval stigma darker brown; male hypopygium with the fused basistyle and sternite produced caudad into a conspicuous lobe, the caudal margin of which bears long yellow setæ.

Male.—Length, about 9 millimeters; wing, 10.5; antenna, about 3.6.

Frontal prolongation of the head short, brownish testaceous, dark brown at tip; palpi brown, elongate. Antennæ (Plate 2, fig. 3) relatively long, the flagellar segments elongate, becoming shorter and slenderer outwardly; verticils very sparse and scattered, more elongate and conspicuous outwardly; scapal segments yellowish brown, the flagellum dark brown. Head above rich fulvous brown, the vertex behind and the occiput more testaceous brown.

Pronotum yellowish brown. Mesonotum nearly uniform dull brownish yellow, the præscutum unmarked. Pleura obscure yellow, the anterior pleurites a little darker. Halteres elongate, pale brown, the base of the stem narrowly yellow, the knobs infuscated. Legs with the coxæ obscure yellow, the fore coxæ a little darker; trochanters obscure yellow; femora pale brown, the bases brighter, the tips a little darkened; tibiæ pale brown, the tips paling to dirty white; tarsi chiefly dirty white, the terminal segment darker. Wings with a strong brownish tinge, the oval stigma darker brown; veins beyond the cord vaguely and narrowly seamed with brown. Venation (Plate 1, fig. 2): Free tip of Sc_2 pale; medial cells relatively deep.

Abdominal tergites dark brown, the bases of the intermediate segments light brown; basal sternites chiefly light yellow, the outer segments brownish black. Male hypopygium viewed from the side (Plate 2, fig. 2) with the heavily blackened ninth tergite, *t*, medially provided with conspicuous erect yellow setæ, the caudal lateral angles produced into an erect black spine on either side. Outer dististyle, *d*, fleshy, dusky at tip, with conspicuous black setæ. Inner dististyle a highly compressed blade.

The fused ventral portion of the basistyle and ninth sternite, *s*, produced caudad into a conspicuous lobe, the broad, gently convex margin of which bears very long conspicuous yellow setæ.

Habitat.—Formosa.

Holotype, male, Noko, altitude 9,000 feet, June 26, 1927 (*S. Issiki*).

Nesopeza trichopyga is well distinguished by the rather remarkable hypopygium of the male. It may be distinguished from *N. taiwania* Alexander by the more elongate antennæ (Plate 2, figs. 3, 4) and the deeper medial cells of the wing (Plate 1, figs. 2, 3).

TIPULA (ACUTIPULA) LACKSCHEWITZIANA sp. nov.

Allied to *T. filicornis* Brunetti; antennæ (male) elongate, with conspicuous erect setæ and pubescence; male hypopygium very large, the ninth tergite subtruncate across the caudal margin; outer dististyle a slender complicated black structure.

Male.—Length, about 14.5 millimeters; wing, 16.5 antenna, about 15.

Frontal prolongation of the head obscure yellow, the dorsal half brighter; nasus relatively slender, with long black setæ, those at the tip yellow. Antennæ (male) very elongate, as shown by the measurements; basal segment of scape very narrow at base; scapal segments obscure yellow, the flagellar segments brown; basal enlargement of segments small and slightly darker in color; flagellar segments elongate-cylindrical, with long scattered black verticils and a shorter delicate erect white pubescence, the longest verticils fully seven or eight times the diameter of the segment at the point of attachment; terminal segment short. Head buffy brown, brighter in front and on the narrow posterior orbits.

Mesonotum pale buffy brown with four scarcely evident, slightly more-grayish stripes that are vaguely margined with a narrow line of darker brown; scutal lobes a little grayish, the median area buffy; scutellum brown, more yellowish medially; postnotum yellowish gray with yellow setæ. Pleura yellow. Halteres relatively slender, pale brown, the base of the knobs somewhat darker. Legs with the coxæ and trochanters light yellow; femora brown, the bases narrowly yellow, the tips narrowly blackened; tibiæ yellowish brown, darkened outwardly; tarsi black, terminal segments broken. Wings with a grayish suffusion; stigma brown; cells C and Sc slightly less infumed

than the stigma, especially the former; prearcular region more yellowish; veins dark brown, obliterative areas extensive. Venation: Cell R_2 small, as in the subgenus, the inner end pointed; cell 1st M_2 relatively small, irregularly pentagonal; m a trifle longer than the petiole of cell M_1; cell 2d A relatively narrow.

Abdominal tergites obscure yellow, the lateral margins narrowly dark brown; sternites clearer yellow; a conspicuous black subterminal ring that includes segments 6 to 8; segment 9 brownish yellow. Male hypopygium (Plate 2, fig. 5) large. Tergal region, *t*, pale, appearing as a convex subrectangular plate, the caudal margin subtruncate, provided with long conspicuous yellow setæ. Outer dististyle, *d*, black, complicated in structure, viewed laterally appearing more or less bomerang-shaped, the long apex obtuse at tip; outer surface of apical arm dull with an appressed pubescence, the inner of mesal surface shiny; viewed caudally (Plate 2, fig. 5*a*), the mesal margin of the style is seen to be microscopically serrulate, near the base bearing a slender arm that is microscopically spiculose. Caudomesal margin of sternal region, *s*, bearing dense brushes of short reddish brown setæ, with an additional median brush; region of sternite ventrad of this densely filled with pale membrane.

Habitat.—Formosa.

Holotype, male, Noko, altitude 8,000 feet, June 26, 1927 (*S. Issiki*).

This interesting *Tipula* is named in honor of my friend, Dr. P. Lackschewitz, of Latvia, eminent student of the crane flies of the Baltic region. It is the first representative of the subgenus *Acutipula* to be described from Formosa. The species is allied to *T. filicornis* Brunetti [4] and *T. mitocera* Alexander; [5] it differs, especially, in the structure of the male hypopygium.

TIPULA NOKONIS sp. nov.

General coloration greenish gray, the præscutum with four dark olive-brown stripes that are narrowly margined with dark brown; antennal scape bright yellow, the flagellum black; tips of the femora black, preceded by a vague yellowish subterminal ring; wings creamy, variegated with brown and gray clouds; male hypopygium with the ninth sternite produced ventrad into a conspicuous tubercle.

Male.—Length, about 18 millimeters; wing, 19.5.

[4] Rec. Ind. Mus. 15 (1918) 267–268.
[5] Rec. Ind. Mus. 29 (1927) 181–182, fig. 3.

Frontal prolongation of head relatively long, nasus distinct, dark grayish brown, with a more-chestnut lateral stripe; palpi dark brown, the base of the elongate terminal segment paler. Antennæ of moderate length, if bent backward extending to shortly beyond the base of the abdomen; scape bright yellow, flagellum black; basal enlargement of the flagellar segments relatively small, verticils comparatively long. Head buffy, more reddish in front and laterally behind, the vertex with a conspicuous dark brown median area.

Mesonotal præscutum with a greenish gray ground color, with four dark olive-brown stripes that are narrowly margined with brownish black; scutum greenish gray medially, each lobe with two dark areas; scutellum dark, sparsely pruinose, with a median brown line; postnotal mediotergite pale greenish gray with a capillary brown median line. Pleura variegated brown and olive-gray, in ill-defined areas, the pleurotergite with a velvety area before the halteres. Halteres elongate, brownish yellow, the base of the knobs conspicuously blackened. Legs with the coxæ greenish gray; trochanters brownish yellow; femora yellowish brown, the tips conspicuously blackened, preceded by a diffuse, somewhat brighter yellow ring; tibiæ brown, passing into dark brown; tarsi brownish black. Wings with a creamy ground color, the prearcular region and cells C and Sc yellow; a conspicuous brown and grayish brown pattern, distributed over the entire wing, the darker spots being at arculus, origin of Rs, and stigma; wing tip rather uniformly darkened; of the paler clouds in the medial cell, the outer one is much the larger, the narrower inner cloud being confluent across vein M with extensive similar clouds in cell R; veins dark brown, brighter in the flavous areas. Venation: Rs long; R_{1+2} entirely preserved, without macrotrichiæ except one or two at extreme base; cell 1st M_2 relatively short and high, irregularly pentagonal; petiole of cell M_1 shorter than m.

Abdominal tergites reddish with three brownish black stripes, the sublateral stripes widening out on the outer segments, the apex of the abdomen, including segments 6 to 8 and the hypopygium black; lateral margins of the segments narrowly buffy; basal sternites more reddish brown, the outer segments dark brown, pruinose; caudal and lateral margins of the segments very narrowly margined with buffy. Male hypopygium (Plate 2, fig. 6) relatively small, the tergite, *t*, fused with the sternite basally. Ninth tergite (Plate 2, fig. 7) relatively short and wide, the caudal margin with a broad U-shaped notch, the

lateral lobes thus formed being even wider, subtruncate to obtusely rounded at tips. Ninth sternite, *s*, produced ventrad into a conspicuous tubercle. Basistyle, *b*, complete. Outer dististyle, *d*, flattened, narrowed at base, more or less spade-shaped, provided with delicate yellow setæ and scattered longer black setæ. Inner dististyle a chitinized, highly compressed blade, the caudal margin with conspicuous yellow setæ. Eighth sternite with the ventral surface provided with very long yellow setæ.

Habitat.—Formosa.

Holotype, male, Noko, altitude 9,800 feet, June 27, 1927 (*S. Issiki*).

Tipula nokonis is generally similar to *T. subapterogyne* Alexander, likewise from Noko, *T. terebrata* Edwards, and several other species in eastern Asia. It differs in the details of coloration of the antennæ, wings, and thorax, but especially in the structure of the male hypopygium. The peculiar tubercle on the ninth sternite is approached in a lesser degree by *T. verecunda* Alexander, of northern Japan.

TIPULA SPARSISSIMA sp. nov.

Belongs to the *T. annulicornis* group; antennæ (male) relatively elongate, bicolorous; mesonotal præscutum golden yellow with four pale olive-brown stripes; wings creamy, vaguely tinted with brown, especially in cell R_3; basal and costal regions light yellow; cord and vein Cu seamed with brown; a small group of macrotrichiæ in the distal end of cell R_5; m-cu close to the fork of M; cell 1st M_2 small; male hypopygium with the median lobe of the tergite short, compressed.

Male.—Length, about 8.5 millimeters; wing, 9.6.

Female.—Length, about 9.5 millimeters; wing, 10.4.

Frontal prolongation of the head relatively short, the nasus reduced to a small tubercle; prolongation obscure yellow, darker laterally; palpi dark brown. Antennæ (male) relatively long, if bent backward extending to beyong the base of the abdomen; scape yellow; flagellar segments bicolorous, the basal enlargement of each segment black, the apex obscure yellow; outer segments more uniformly infuscated. In the female the antennæ are short but similarly bicolorous. Head yellowish gray to olive gray.

Mesonotal præscutum golden yellow with four pale olive brown stripes, the intermediate pair narrowed behind, scarcely attaining the suture, the capillary line separating them only a little paler than the stripes themselves; anterior ends of the

intermediate stripes more or less golden pollinose; scutum greenish yellow, the lobe marked with brown; scutellum and postnotum brownish yellow. Pleura yellow, vaguely variegated with dusky on the propleura, anterior anepisternum and again near the root of the halteres. Halteres slender, testaceous, the apices of the knobs light yellow. Legs with the coxæ and trochanters yellow; femora yellow, the tips brownish black; tibiæ brown, the tips narrowly darkened; tarsi dark brown. Wings with a faint creamy ground color, vaguely tinged with brown, more especially in cell R_3; prearcular and costal regions light yellow; stigma oval, dark brown, conspicuous brown seams between the branches of Cu and along the cord; obliterative areas very extensive, appearing as creamy before and beyond the stigma, and across cell 1st M_2, covering almost all of the basal sections of M_{1+2} and M_3; veins dark brown, yellowish in the flavous areas. A small group of from about five to fifteen macrotrichiæ in the outer end of cell R_5. Venation (Plate 1, fig. 4): Rs relatively short; R_{1+2} entire; R_2 distinct, more than one-half R_1 alone; cell 1st M_2 very small; m-cu long, close to the fork of M; m in cases greatly reduced; m-cu long.

Abdominal tergites obscure brownish yellow, the caudal and lateral margins of the segments darkened; sternites obscure yellow; subterminal segments blackened; hypopygium dark brown. Male hypopygium (Plate 2, fig. 8) with the caudal margin of the ninth tergite produced caudal into a short, highly compressed, median blade. Tergite, *t*, and sternite, *s*, fused basally, the basistyle more or less rectangular in outline, cut off from the remainder of the hypopygium by incomplete sutures above and below. Outer dististyle relatively slender, pale, with scattered setæ. Inner dististyle, *d*, a greatly compressed blade that extends to a slender black point at the anterior margin.

Habitat.—Formosa.

Holotype, male, Noko, altitude 8,000 feet, June 26, 1927 (*S. Issiki*). Allotopotype, female, pinned with the male. Paratopotypes, 2 males, 8,000 to 8,500 feet.

Although generally similar to *T. sparsiseta* Alexander, *T. acifera* Alexander, and other Japanese species of the *T. annulicornis* group, the present species is abundantly distinct in the venation and wing pattern. The present form is likewise generally similar to *T. microcellula* Alexander, also from Formosa, but actually belongs to an entirely different group of species.

LIMONIINÆ

PEDICIINI

TRICYPHONA OROPHILA sp. nov.

General coloration dark gray, the præscutum with three black stripes; antennæ 16-segmented, black throughout; halteres yellow, the knobs weakly infuscated; legs black, the femoral bases yellow; wings yellowish brown, the base clearer yellow; r-m connecting with R_{4+5} just beyond origin; m at fork of M_{1+2} male hypopygium with the interbases appearing as very large, flattened, curved blades.

Male.—Length, about 8 millimeters; wing, 10.

Rostrum and palpi black. Antennæ 16-segmented, black throughout, the basal segment sparsely pruinose; flagellar segments short-oval, the outer segments more elongate oval and less crowded. Head dark gray; vertical tubercle conspicuous, simple.

Pronotum dark gray. Mesonotum dark gray, the præscutum with three black stripes, the median stripe weakly bifid behind; extreme margin of humeral region more chitinized, obscure horn yellow; scutal lobes black, the median area and remainder of the notum gray pruinose. Pleura dark gray. Halteres relatively elongate, pale yellow, the extreme base of the stem more orange, the knobs weakly infuscated. Legs with the coxæ dark gray, the lower faces more yellowish, especially of the fore coxæ; trochanters brownish yellow; femora black, the bases broadly yellow, narrowest on the fore femora where it includes only about the basal sixth, broader on the hind legs where nearly the basal half is brightened; fore and middle tibiæ black, hind tibiæ paler, the tips darkened; tarsi black. Wings with a strong yellowish brown tinge, the base more strongly yellow; narrow and vague dusky seams along the cord; veins dark brown, the subcostal and prearcular veins more yellowish. Venation (Plate 1, fig. 5): Sc long, Sc_1 extending to just beyond the base of cell R_4; Sc_2 some distance before the origin of Rs; R_2 about twice R_{1+2}; r-m connecting with R_{4+5} just beyond the end of Rs; cell R_4 deep; m present, opposite the fork of M_{1+2} m-cu connecting with M_4 just beyond its base.

Abdomen brownish black, including the hypopygium. Male hypopygium (Plate 2, fig. 9) with the ninth tergite, *t*, very large, the caudal margin subtruncate or very feebly emarginate, provided with low lobes. Basistyle, *b*, moderately slender, deeply bifid at apex, the outer lobe a little more elongate, spinose and

setose at tip, the inner lobe more flattened, with very elongate setæ. Dististyle, *d*, single, in the notch of the basistyle, provided with short, black, peglike spines. Interbase, *i* (only one shown in figure), very powerful, appearing as flattened divergent blades, strongly curved, the inner margin with a few microscopic setulæ, the apex strongly recurved, obtuse, set with low spinous teeth.

Habitat.—Formosa.

Holotype, male, Noko, altitude 9,000 feet, June 26, 1927 (*S. Issiki*).

Tricyphona orophila is very different from other described members of the genus; in general appearance it is most similar to *T. optabilis* Alexander, of Japan, but is still very distinct.

RHAPHIDOLABIS (RHAPHIDOLABIS) ATRIPES sp. nov.

General coloration light gray, the præscutum with four narrow dark brown stripes; antennæ 14-segmented, black throughout; legs black, the femoral bases restrictedly paler; wings subhyaline, stigma brown, prearcular region light yellow; cell R_3 petiolate; cell M_2 open.

Male.—Length, about 5.5 millimeters; wing, 7.

Rostrum gray; palpi black. Antennæ 14-segmented, the terminal segment longer than the penultimate; antennæ black, the basal segment a little pruinose; second scapal segment long, nearly equal in length to the first flagellar; intermediate flagellar segments oval. Head light gray, the center of the vertex a little infuscated.

Pronotum light gray. Mesonotum light gray, the præscutum with four narrow dark brown stripes, the intermediate pair not reaching the suture; each scutal lobe with two dark markings. Pleura clear light gray, including the dorsopleural membrane. Halteres pale, the knobs infuscated. Legs with the coxæ gray; trochanters light brown; remainder of legs black, only the extreme bases of the femora somewhat paler. Wings subhyaline, the ill-delimited stigma brown; prearcular region light yellow; veins dark brown. Venation (Plate 1, fig. 6): Sc_2 + R approximately two-thirds Sc_2 + R_1; R_2 gently oblique in position, much longer than R_{1+2}; Rs weakly angulated near midlength; R_{2+3+4} longer than R_2; cell M_1 short; cell M_2 open; m-cu at about one-third its length beyond the fork of M.

Abdomen dark brown, sparsely pruinose. Male hypopygium (Plate 2, fig. 10) with the lateral lobes of the ninth tergite, *t*, large, conspicuously setiferous, the median area smooth, sub-

chitinized. Lateral lobe of the basistyle, *b*, with abundant setæ and short spines. Dististyle, *d*, parallel-sided, a little longer than the lobe of the basistyle. Interbase broad at base, gradually narrowed to the curved acute tip.

Habitat.—Formosa.

Holotype, male, Higashinoko, altitude 7,500 feet, June 27, 1927 (*S. Issiki*).

Rhaphidolabis atripes is allied to *R. flavibasis* Alexander, of Japan, differing in the smaller size, shorter antennæ, the presence of four instead of three præscutal stripes, and slight differences in the male hypopygium. This may possibly be the species recorded as *R. brunettii* Edwards [6] based on a female specimen from Arisan. Brunetti's description [7] differs in many regards from the present form in the coloration and structure of the antennæ. It is possible that the high mountains of Formosa support a rather considerable number of species of pediciine crane flies.

LIMONIINI

ORIMARGA PRUINOSA sp. nov.

General coloration of head and thorax light gray; wings grayish subhyaline, the veins pale; R_{2+3} elongate, nearly as long as R_3 alone; abdomen elongate, the tergites dark brown.

Female.—Length, about 7 millimeters; wing, 5.8.

Rostrum brown; palpi dark brown. Antennæ with the scapal segments brown; flagellum black; antennæ relatively short, if bent backward ending some distance before the wing root; flagellar segments oval. Head light gray, brighter anteriorly.

Mesonotum light gray, the præscutum with four slightly darker gray stripes; anterior lateral pretergites restrictedly orange-yellow. Pleura gray. Halteres pale orange-yellow, the knobs a trifle darker. Legs with the coxæ dark brown, sparsely pruinose; trochanters yellowish brown; remainder of legs brownish yellow, the terminal tarsal segments darker. Wings grayish subhyaline, the veins pale. Macrotrichiæ of veins relatively abundant; none on Rs, R_2, or the basal two-thirds of R_{2+3}; a series of trichiæ on the other longitudinal veins beyond the cord; no trichiæ on Cu or the anal veins. Venation (Plate 1, fig. 7): Sc long, Sc_1 ending nearly opposite the fork of Rs, Sc_2 a short distance from its tip; free tip of Sc_2 very pale and indistinct but present; R_{2+3} elongate, nearly as long

[6] Ann. & Mag. Nat. Hist. VIII 18 (1916) 254; IX 8 (1921) 101.

[7] Fauna British India, Dipt. Nematocera (1912) 492.

as R_3; R_2 a little shorter than R_{1+2}; petiole of cell M_3 shorter than M_4; m-cu shortly before midlength of Rs.

Abdomen elongate; tergites dark brown; sternites a little more yellowish brown; genital segment obscure orange. Ovipositor with the tergal valves slender, gently upcurved to the acute tips.

Habitat.—Japan (Honshiu).

Holotype, female, Mount Bantaizan, Fukushima-ken, August 4, 1927 (*S. Issiki*).

Orimarga pruinosa is most closely allied to *O. formosicola* Alexander, of Fomosa, which differs in the narrower wings with darker veins and slightly different venation. The genus *Orimarga* had not been recorded hitherto from the main islands of Japan.

DICRANOPTYCHA CAESIA sp. nov.

Antennæ brown throughout; thorax clear light gray, the præscutum with light brown stripes; tips of the femora weakly infuscated; wings strongly tinged with yellow; m greatly reduced in length; abdomen obscure yellow.

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

Rostrum dark, sparsely pruinose; palpi dark brown. Antennæ brown throughout, the first scapal segment still darker, pruinose; flagellar segments oval, with relatively short verticils. Head light gray.

Pronotum and mesonotum clear light gray, the præscutum with two narrow submedian pale brown stripes that are obsolete anterior to the small tuberculate pits; lateral stripes less distinct; pseudosutural foveæ black. Pleura clear light gray. Halteres pale yellow. Legs with the coxæ yellow, the extreme bases of the fore and middle coxæ a little darkened and sparsely pruinose; femora yellow, the tips narrowly and weakly infuscated; tibiæ and basitarsi yellow, the tips narrowly brown; remainder of tarsi dark brown. Wings strongly tinged with yellow, iridescent; veins brown, the costal, subcostal, and radial veins yellow. Costal fringe (female) short. Venation: Rs a little longer than cell 1st M_2; m greatly reduced, the basal section of M_3 correspondingly lengthened; m-cu about one-half its length beyond the fork of M.

Abdomen obscure yellow, the segments more infuscated laterally. Ovipositor with the tergal valves conspicuously compressed, the tips obtusely rounded.

Habitat.—Japan (Honshiu).

Holotype, female, Tatusawa, near Inawasiro, Fukushimaken, altitude 2,000 feet, August 5, 1927 (*S. Issiki*).

Dicranoptycha caesia may be confused only with *D. yamata* Alexander, which is distinguished by the much larger size and different coloration, such as the pale antennal scape and uniformly darkened abdomen.

HEXATOMINI

EPIPHRAGMA NYMPHICA sp. nov.

General coloration dark brown; antennæ with the scape black, the basal flagellar segment yellow; outer flagellar segments passing into dark brown; halteres with the apices of the knobs light yellow; legs yellow, the femora with a broad black subterminal ring; wings creamy, the costal region light yellow, the disk with a broken, more or less ocelliform, dark brown pattern; radial cells extensively free from markings.

Male.—Length, about 8 to 9 millimeters; wing, 9.5 to 11.

Rostrum brownish black; palpi black. Antennæ with the scapal segments black; basal segment of flagellum enlarged, bright yellow; second segment slightly more obscure; succeeding flagellar segments testaceous, the outer segments passing into dark brown; flagellar segments cylindrical, with relatively long verticils. Head dark brown, the posterior orbits a little brighter.

Pronotum and mesonotum dark brown, the præscutum with a narrow velvety black median stripe that is narrowed to a point behind and becomes obsolete some distance before the suture; anterior half of the sclerite a little dusted with golden-yellow pollen; lateral margins of the sclerite blackened. Pleura, including the dorsopleural region, black; surface vaguely variegated with areas of yellowish pollen. Halteres dark brown, the base of the stem restrictedly pale, the apices of the knobs light yellow. Legs with the coxæ brownish yellow; trochanters obscure yellow; femora yellow with a relatively broad black ring before the tips, this ring nearly twice as extensive as the pale apex beyond; tibiæ and tarsi yellow, the terminal tarsal segment brown. Wings creamy, the costal region broadly light yellow; a handsome dark brown pattern, consisting of confluent broken circles in cells C to M, having as centers a point beyond the arculus and the origin of Rs, the latter ocellus connected with a large solid area in the cubital and anal cells, ending at vein 2d A, with a connecting area at near two-thirds the length of cell 2d A; the basal ocellus is connected with the prearcular region; base of cell 2d A darkened;

a third, very extensive, broken ocellus has the entire cord as a center; beyond the cord an irregular arcuated brown band extending from the end of cell R_5, across the outer end of cell 1st M_2 to the wing margin in cells Cu and 1st A; besides the above major areas there are scattered isolated marks at h, the supernumerary crossvein in cell C, tip of R_3, and tips of veins M_3 and M_4; the radial cells are thus conspicuously free from markings except basally and in cell R_5; veins yellow, especially bright in the outer costal region, dark brown in the infuscated areas. Venation: Supernumerary crossvein in cell C perpendicular; R_{2+3+4} longer than R_{2+3}; cell M_1 about as long as its petiole; cell 1st M_2 large, gently widened outwardly; m-cu near the inner end of cell 1st M_2, about its own length beyond the fork of M.

Abdominal tergites dark brown, the segments variegated caudally and medially with obscure yellowish gray; sternites dark, obscure yellow medially, the caudal margins narrowly gray; hypopygium yellowish brown.

Habitat.—Formosa.

Holotype, male, Kirakei, altitude 4,000 feet, June 28, 1927 (*S. Issiki*). Paratopotype, male.

Epiphragma nymphica is separated from the rather numerous species in southern and eastern Asia by the diagnostic features listed above. The species appears to be most similar to *E. vicina* Brunetti in the black femoral ring but differs in many important details of coloration.

PSEUDOLIMNOPHILA NOKONIS sp. nov.

General coloration of thorax dark brown, the præscutum dull ocherous, with a broad black median stripe; pleura with a narrow black longitudinal stripe; rostrum and palpi yellow; antennæ black; wings yellow, sparsely variegated with brown; cells beyond the cord unusually short for a member of this genus.

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

Rostrum and palpi yellow. Antennæ black throughout; flagellar segments long-oval. Head brownish gray.

Pronotum ocherous brown, somewhat darker laterally. Mesonotal praescutum dull ocherous, with three brown stripes, the median stripe broad and conspicuous, especially behind, the lateral stripes scarcely evident; tuberculate pits lacking; pseudosutural foveæ reduced to small pale depressions close to the margin; remainder of mesonotum dark brown, sparsely pruinose. Pleura with a narrow black longitudinal stripe extending

from the cervical sclerites, passing above the fore coxæ, traversing the anepisternum and middle portion of the pteropleurite to the pleurotergite, where it is more pruinose; ventral pleurites pale gray; dorsopleural region pale. Halteres relatively long, pale yellow, the knobs infuscated. Legs with the coxæ and trochanters yellow; remainder of legs yellow, the tips of the tibiæ weakly infuscated, the terminal tarsal segments passing into dark brown. Wings with a strong yellow suffusion; stigma long-oval, pale brown; very narrow and vague brown seams at origin of Rs, along the cord and the outer end of cell 1st M_2; veins dark brown, the basal veins more yellowish. Venation (Plate 1, fig. 8): Sc short, both Sc_1 and Sc_2 ending before the fork of Rs; Rs strongly arcuated at origin; R_{2+3+4} only gently arcuated; R_2 subequal to R_{1+2}; all cells beyond the cord unusually short; cell M_1 about three times its petiole; cell 1st M_2 large; m-cu about one-half its length from the outer end of the cell; anterior arculus lacking.

Abdominal tergites dark brown, the caudal margins of the individual segments obscure yellow; sternites clearer yellow. Ovipositor with the valves horn-colored, the sternal valves black at base; tergal valves very slender and only gently upcurved.

Habitat.—Formosa.

Holotype, female, Noko, altitude 8,000 feet, June 26, 1927 (*S. Issiki*).

Pseudolimnophila nokonis is somewhat similar to *P. kirishimensis* (Alexander), of southern Japan, differing from this and all other regional species by the short subcosta and the unusually short veins and cells beyond the cord, in combination with the petiolate cell M_1 and position of m-cu.

LIMNOPHILA (TRICHOLIMNOPHILA) EXCELSA sp. nov.

General coloration black, the thorax sparsely pruinose; antennæ black; halteres yellow; legs yellow, the tips of the femora broadly, of the tibiæ more narrowly, blackened; wings brownish yellow, sparsely variegated with brown; macrotrichiæ of cells restricted to outer ends of cells R_2 to M_3.

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

Rostrum and palpi black. Antennæ black, the first scapal segment vaguely paler at base; flagellar segments with long verticils. Head black, heavily gray pruinose.

Pronotum black, gray pruinose. Mesonotum coal-black, the surface very sparsely pruinose to give a subnitidous appearance; postnotum more pruinose. Pleura black, the surface slightly

pruinose. Halteres pale yellow. Legs with the fore coxæ dusky, the remaining coxæ testaceous yellow; trochanters yellow; femora yellow, the tips broadly brownish black; tibiæ yellow, the tips narrowly blackened; tarsi testaceous yellow, the tips of segments 1 and 2 and the terminal segments darker; legs with long conspicuous setæ. Wings with a strong brownish yellow suffusion, the base and costal region clearer yellow; stigma oval, dark brown; narrow brown seams along the cord and outer end of cell 1st M_2; veins brown, more yellowish near the wing base. Macrotrichiæ of veins of moderate length; of the cells restricted to the distal ends of cells R_2, R_3, R_4, R_5, 2d M_2, and M_3, more abundant in cell M_1. Venation (Plate 1, fig. 9): Sc relatively short, Sc_1 ending before the fork of Rs; cell M_1 longer than its petiole; cell 1st M_2 rectangular; m-cu about two-thirds its length beyond the fork of M.

Abdomen brownish black, including the genital segment. Ovipositor with the elongate valves yellowish horn color; tergal valves straight, the tips gently upcurved.

Habitat.—Formosa.

Holotype, female, Noko, altitude 8,000 feet, June 26, 1927 (*S. Issiki*).

Limnophila excelsa is entirely distinct from *L. platystyla* Alexander, the only other species of the subgenus *Tricholimnophila* known from Formosa. It is more closely allied to the more northern *L. pilifer* Alexander, differing especially in the smaller size, dark antennæ, more intensely black thorax, and other characters. The male, when discovered, will very probably furnish additional hypopygial differences.

LIMNOPHILA (PRIONOLABIS) ORITROPHA sp. nov.

Size relatively large (wing, male, over 10 millimeters); general coloration coal-black; halteres yellow; femora extensively blackened, especially the fore and middle femora; male hypopygium with the outer dististyle bispinous.

Male.—Length, about 9 millimeters; wing, 11.5.

Rostrum, palpi, and antennæ black; flagellar segments with the ventral face a little produced, the segments rapidly decreasing in size outwardly. Head black, very sparsely pruinose.

Pronotum black. Mesonotum polished coal-black, especially the region of the præscutal stripes. Pleura black, a little duller than the notum. Halteres yellow. Legs with the coxæ and trochanters black; fore femora black, only the extreme base pale; middle femora with about the distal half blackened; hind

femora testaceous yellow, only about the distal sixth blackened; tibiæ testaceous brown, the bases and tips blackened; basitarsi brownish testaceous, the tips and remaining tarsal segments passing into black; legs with conspicuous black setæ. Wings with a strong yellow suffusion, the base and costal region even brighter in color; stigma very small, dark brown; origin of Rs, the cord and outer end of cell 1st M_2 narrowly seamed with brown; Cu and the longitudinal veins beyond the cord vaguely seamed with dusky; veins dark brown, the basal and costal veins yellow. Costal fringe and macrotrichiæ of the veins beyond the cord relatively elongate. Venation (Plate 1, fig. 10): Sc_1 ending about opposite the fork of R_{2+3+4}, Sc_2 opposite the fork of Rs; R_{2+3+4} subequal to the basal section of R_5; cell M_1 about equal to its petiole; m-cu beyond midlength of the lower face of cell 1st M_2.

Abdomen black, including the hypopygium. Male hypopygium (Plate 2, fig. 11) with the caudal margin of the ninth tergite, *t*, emarginate, thickened, and provided with microscopic spiculæ. Outer dististyle, *d*, conspicuously setiferous, terminating in a slender black spine, with a similar subterminal spine. Inner dististyle stout, terminating in a narrow, truncated, black point, before the apex with a group of small spines, the number of the latter variable, there being a group of four on one style of the type and only two on the other, as figure. Gonapophyses and ædeagus as in the subgenus.

Habitat.—Formosa.

Holotype, male Noko, altitude 8,500 feet, June 26, 1927 (*S. Issiki*).

The subgenus *Prionolabis* had not been recorded from Formosa.

ERIOCERA ISSIKII sp. nov.

Belongs to the *E. spinosa* group; antennæ (male) short; mesonotal præscutum golden-yellow with three conspicuous black stripes; legs black, the femoral bases broadly fulvous; wings brownish, the base broadly bright yellow, the apex paler yellow; abdomen black.

Male.—Length, about 18 millimeters; wing, 18; first flagellar segment of antenna, 1.4.

Rostrum dark brown, the long palpi black. Antennæ broken beyond the first flagellar segment but from this evidently short for a member of this genus; antennæ black throughout; first scapal segment tumid; first flagellar segment shorter than the

second segment of the palpi, unarmed except for scattered appressed setæ. Head velvety black medially, the broad lateral margins of the vertex buffy brown; vertical tubercle weakly bifid in front.

Mesonotal præscutum golden-yellow with three conspicuous black stripes; scutal lobes black, the suture and anterior portion of the median area of the scutum black, the posterior portion more pruinose; scutellum heavily dusted with yellowish pollen; postnotum black. Pleura with the dorsopleural membrane yellowish gray pollinose; a broad stripe crossing the anepisternum and anterior portion of the pteropleurite; sternopleurite and pleurotergite densely covered with a miscroscopic yellowish gray pubescence. Halteres obscure yellow, the knobs brownish black. Legs with the coxæ black, heavily yellowish gray pruinose; trochanters obscure fulvous; remainder of legs black, the femoral bases broadly fulvous, this including about the basal third of the fore femora and about the basal half of the posterior femora. Wings with a strong brownish suffusion, the base broadly bright yellow; cells beyond the cord fading into paler yellow; stigma small, dark brown; most of the longitudinal veins further seamed with brown; veins dark brown, yellowish in the flavous costal and basal areas. Venation (Plate 1, fig. 11): R_{2+3+4} shorter than the basal section of R_5; cell M_1 present, nearly as long as its petiole; distal section of Cu_1 very short.

Abdomen, including the hypopygium, black; basal sternites a little paler.

Habitat.—Japan (Honshiu).

Holotype, male, Zyogi, near Sendai, Miyagi-ken, August 2, 1927 (*S. Issiki*).

Eriocera issikii is very distinct from all other Asiatic species of the *E. spinosa* group. I take great pleasure in naming this very distinct crane fly in honor of the collector, Prof. Syuti T. Issiki, who has added very materially to our knowledge of the Tipulidæ of Japan and Formosa.

ELEPHANTOMYIA (ELEPHANTOMYIA) LUCULENTA sp. nov.

General coloration reddish yellow; rostrum short, not exceeding one-half the length of the body in either sex; wings with a strong yellow suffusion; cell 1st M_2 large; m-cu at near midlength of the cell, longer than the distal section of Cu_1.

Male.—Length (excluding rostrum), about 6 millimeters; wing, 7.5; rostrum, about 3.

Female.—Length (excluding rostrum), about 8.5 millimeters; wing, 8.5; rostrum, about 3.2.

Rostrum dark brown, not exceeding one-half the length of the body in either sex. Antennæ with the first scapal segment ocherous; remainder of antennæ dark brown; outer flagellar segments linear with elongate verticils. Head reddish ocherous, the narrow anterior vertex and posterior orbits more whitish.

Thorax somewhat reddish yellow, the surface subnitidous. Halteres obscure yellow, the knobs a little darker. Legs with the coxæ and trochanters yellowish testaceous; remainder of legs obscure brownish yellow, the tarsi somewhat brighter in color; tibial spurs slender. Wings with a strong yellow suffusion, more intense in the costal and apical regions; veins yellowish brown. Venation (Plate 1, fig. 12): Sc_1 ending just before the fork of Rs, Sc_2 close to its tip; cell 1st M_2 very large, nearly as long as vein M_3 beyond it; m-cu at near midlength of cell 1st M_2, longer than the distal section of Cu_1.

Abdominal tergites brownish yellow, the sternites clearer yellow; hypopygium yellow; in the male with a subterminal black ring that includes segment 8. Ovipositor with the tergal valves very long and slender, nearly straight, the tip gently upcurved; sternal valves shorter and stouter.

Habitat.—Formosa.

Holotype, male, Higashinoko, altitude 7,500 feet, June 27, 1927 (*S. Issiki*).

ERIOPTERINI

GNOPHOMYIA LATEROSPINOSA sp. nov.

General coloration dark brown; antennæ relatively elongate; head dark gray; halteres yellow; wings tinged with yellow; cell 1st M_2 long, subequal to vein M_4 beyond it; male hypopygium with the outer dististyle a long slender rod that bears a conspicuous erect spine just before midlength.

Male.—Length, about 4.5 millimeters; wing, 5.2; antenna, about 1.7.

Rostrum and palpi brownish black. Antennæ (male) relatively elongate, as shown by the measurements, black throughout; flagellar segments elongate-cylindrical, clothed with a dense, erect, white pubescence. Head dark gray.

Pronotum dark brown. Anterior lateral pretergites restrictedly yellow, the posterior pretergites narrowly darkened before the suture. Mesonotal præscutum and scutum dark brown; scutellum a little more testaceous; postnotum dark brown.

Pleura dark brown, the dorsopleural region restrictedly pale. Halteres pale, the knobs light yellow. Legs with the fore coxæ dark brown, the remaining coxæ more testaceous; trochanters testaceous; femora yellowish brown with delicate dark setæ; tibiæ and tarsi passing into dark brown. Wings with a strong yellowish suffusion; stigma lacking; veins brownish yellow. Venation (Plate 1, fig. 13): Sc_1 ending about opposite R_{2+3+4}, Sc_2 some distance from its tip; Rs in alignment with R_5; r-m at the end of Rs; cell 1st M_2 relatively long, gently widened outwardly, about as long as vein M_4 beyong it; m-cu about its own length beyong the fork of M.

Abdomen brownish black, the basal sternites more yellowish. Male hypopygium (Plate 2, fig. 12) with the basistyles, *b*, short and stout, the mesal face armed with four distinct groups of stout spinous setæ, the largest of these setæ being two located on the extreme cephalic mesal portion. Outer dististyle, *d*, very long and slender, appearing as a nearly straight rod that is longer than the basistyle, a little expanded at apex, the mesal edge of which is microscopically toothed, the surface of the rod at apex with small setulæ; before midlength of the rod a conspicuous erect spine. Inner dististyle small, the apex armed with long conspicuous setæ from conspicuous raised tubercles.

Habitat.—Japan (Honshiu).

Holotype, male, Tatusawa, near Inawasiro, Fukushima-ken, altitude 2,000 feet, August 5, 1927 (*S. Issiki*).

GONOMYIA (PTILOSTENA) PALLENS sp. nov.

General coloration yellow, the præscutum and scutum marked with reddish brown; pleura striped; wings grayish yellow; petiole of cell R_3 subangularly bent near midlength and here with a distinct spur of R_2; male hypopygium with the tergal region produced caudad into two slender, feebly divergent rods.

Male.—Length, about 4.8 millimeters; wing, 5.5.

Rostrum and palpi black. Antennæ with the scapal segments light yellow, the basal flagellar segments brownish yellow, the outer flagellar segments passing into dark brown; antennæ of moderate length, if bent backward extending approximately to the wing-root; flagellar segments elongate-oval, with moderately long verticils. Head conspicuously light yellow, not at all darkened behind.

Mesonotal stripes and scutal lobes more reddish brown than in *G.* (*P.*) *sachalinensis;* scutellum somewhat obscure yellow.

Pleura and postnotal mediotergite marked as in *sachalinensis*. Legs with the tips of the femora not at all darkened, the tips of the tibiæ rather narrowly infuscated but scarcely blackened. Wings with a grayish yellow tinge, the base and costal region clearer yellow; veins brown, more luteous in the yellow areas. Venation (Plate 1, fig. 14): Sc long, Sc_1 extending about to mid-length of Rs, Sc_2 opposite the origin of Rs; petiole of cell R_3 shorter than in *sachalinensis*, subangularly bent, at the point of angulation with a distinct spur of R_2; petiole of cell M_2 short.

Abdominal tergites dark brown, the caudal margins of the segments conspicuously yellow; hypopygium yellow. Male hypopygium (Plate 2, fig. 13) with two elongate, gently divergent pale rods (only one shown in the figure) arising from what appears to be the ninth tergite, these rods conspicuously setiferous near base. Basistyle, *b*, stout basally, the outer apical angle produced into a large pale setiferous lobe. Three dististyles present, the outer, *d*, a long simple acicular rod, its tip an elongate black spine; the largest dististyle appears as a glabrous flattened blade, on the outer margin with a long slender glabrous rod that bears a large black tooth at base; innermost dististyle slender, bifid, the arms appressed, the outer arm a slender, black-tipped spine, the inner arm pale, with conspicuous setæ. Ædeagus with a conspicuous blackened bispinous head, as figured.

Habitat.—Japan (Honshiu).

Holotype, male, Sakunami, near Sendai, Miyagi-ken, August 2, 1927 (*S. Issiki*).

Gonomyia (*Ptilostena*) *pallens* is closely allied to *G.* (*P.*) *sachalinensis* Alexander, of Karafuto, which differs chiefly in details of venation. The male of the last-named species is still unknown.

GONOMYIA (LIPOPHLEPS) PTILOSTENOIDES sp. nov.

General coloration black, the thorax variegated with yellow; halteres and legs black; wings with a faint blackish suffusion; Sc_1 ending opposite the origin Rs; medial field of the wing as in the subgenus *Ptilostena;* abdomen black, the pleural membrane sulphur yellow.

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

Rostrum and palpi black. Antennæ black, the first scapal segment pruinose; flagellar segments oval, becoming smaller outwardly; verticils relatively short. Head black, the surface

sparsely pruinose; front and anterior orbits broadly buffy yellow.

Pronotum black, the anterior lateral pretergites broadly light yellow; posterior lateral pretergites very narrowly light yellow. Mesonotal præscutum chiefly plumbeous black, the lateral and humeral portions restrictedly shiny black; scutum dull black, the median area in front restrictedly pale; a small yellow spot above the wing root; scutellum broadly light yellow; postnotum black. Pleura black, the dorsopleural region yellow; a narrow, longitudinal, yellowish white stripe extending from behind the fore coxæ, crossing the dorsal portion of the sternopleurite, becoming more extensive on the metapleura and pteropleurite. Halteres black, the knobs scarcely paler. Legs black throughout. Wings with a faint blackish suffusion; veins brownish black, the basal section of M_{1+2} paler. Macrotrichiæ of veins relatively short and sparse. Venation (Plate 1, fig. 15): Sc short, Sc_1 ending opposite the origin of Rs, Sc_2 some distance from its tip; Rs gently arcuated at origin; M in alignment with M_{3+4}; cell M_2 small, much shorter than its petiole; m-cu more than its own length before the fork of M.

Abdomen black, the pleural membrane sulphur yellow. Ovipositor with the valves yellowish horn-color, the tips of the tergal valves extensively blackened; tergal valves slender, only gently upcurved.

Habitat.—Formosa.

Holotype, female, Noko, altitude 8,000 feet, June 26, 1927 (*S. Issiki*).

Gonomyia (*Lipophleps*) *ptilostenoides* is a very puzzling species. The venation of the radial field of the wing is as in the subgenus *Lipophleps,* but that of the medial field is as definitely that of the subgenus *Ptilostena.* Until more material is forthcoming, I am referring the fly to *Lipophleps,* where it would run by means of existing keys.

GONOMYIA (GONOMYIA) GILVIPENNIS sp. nov.

General coloration of mesonotum and scutum dark brown; scutellum light yellow; pleura pale reddish with a whitish longitudinal stripe; head gray; halteres yellow; wings with a strong yellowish suffusion; vein Sc relatively long; cell 1st M_2 closed; male hypopygium with a single dististyle; phallosome asymmetrical.

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

Female.—Length, about 4.5 millimeters; wing, 5.2.

Rostrum obscure brownish yellow; palpi dark brown. Antennæ brownish black, the first scapal segment a trifle paler; flagellar segments oval, with a delicate white pubescence. Head gray, brighter anteriorly.

Pronotum yellow. Mesonotal præscutum dark brown, the humeral triangle and broad lateral margins yellow; scutal lobes dark brown, the median region broadly obscure yellow; scutellum light yellow; postnotum dark brown. Pleura pale reddish with a whitish longitudinal stripe across the dorsal portion of the sternopleurite; dorsopleural region pale yellow. Halteres relatively elongate, yellow. Legs with the coxæ and trochanters yellowish testaceous; femora obscure yellow at base, passing into dark brown; tibiæ and basitarsi pale brown, the terminal tarsal segments a little darker, with yellow setæ. Wings with a strong yellowish suffusion, the stigmal region vaguely darker; veins pale brown, the basal and subcostal veins somewhat more yellow. Venation (Plate 1, fig. 16): Sc relatively long, Sc_1 extending to from one-third to nearly opposite midlength of Rs, Sc_2 shortly beyond this origin; cell R_3 large; cell 1st M_2 closed; m-cu close to the fork of M, in cases a short distance beyond. In the allotype, the basal section of M_3 is only weakly preserved in both wings.

Abdominal tergites dark brown, the lateral margins and sternites more yellowish. Male hypopygium (Plate 2, fig. 14) with the basistyles, *b*, relatively slender, the outer apical angle produced caudad into a very long slender lobe that is approximately as long as the basal portion of the style; a smaller oval lobe at apex of basistyle, this provided with microscopic setulæ in addition to stouter setæ. A single dististyle, *d*, present, this appearing as a powerful chitinized blade that terminates in a slender curved spine; on the inner face of the style near base with a stout pale lobe that bears two stouter fasciculate setæ in addition to smaller normal setæ. Phallosome, *p*, consisting of a very long pale compressed blade that is irregularly bifid near apex, a long slender rod that is gently sinuous, the tip blackened, and a much smaller and slenderer needlelike spine. Ovipositor with the valves elongate, the tergal valves gently upcurved.

Habitat.—Japan (Honshiu).

Holotype, male, Tatusawa, near Inawasiro, Fukushimaken, altitude 2,000 feet, August 5, 1927 (*S. Issiki*). Allotopotype, female. Paratopotypes, 2 males.

DASYMOLOPHILUS NOKOENSIS sp. nov.

General coloration brown; antennæ short; wings pale grayish subhyaline, the cells virtually without macrotrichiæ.

Male.—Length, about 1.8 millimeters; wing, 2.8.

Female.—Length, about 2 millimeters; wing, 3.

Rostrum and palpi dark brown. Antennæ short, dark brown throughout, if bent backward extending nearly to the wing root. Head dark brown.

Mesonotum and pleura brown, with long conspicuous dark brown setæ. Halteres dark brown, only the base of the stem restrictedly pale. Legs with the coxæ and trochanters brownish testaceous; remainder of legs brownish testaceous, covered with long dark setæ. Wings pale grayish subhyaline, the very long abundant macrotrichiæ of the veins dark brown; veins pale brown, relatively inconspicuous. Macrotrichiæ of cells virtually lacking, there being a row of from eight to ten punctures in cell R_1 in alignment with R_3; in the male a few scattered punctures in the extreme outer end of cell R_3. Venation (Plate 1, fig. 17): R_{2+3} perpendicular to the end of Rs, subequal to and in alignment with R_2; basal section of R_5 and r-m lying just beyond the fork of Rs.

Abdomen brownish black, including the male hypopygium. Ovipositor with the tergal valves very powerfully constructed, compressed, strongly upcurved.

Habitat.—Formosa.

Holotype, female, Noko, altitude 9,800 feet, June 26, 1927 (*S. Issiki*). Allotopotype, a broken male, altitude 9,000 feet.

Dasymolophilus nokoensis is the first member of the genus to be described from Asia. It is distinguished from the known species of the genus by the virtual lack of macrotrichiæ in the cells of the wing. The nearest approach to this condition known hitherto is found in *D. subnudus* Alexander, of western North America, where the trichiæ are sparse in the distal cells of the wing although well distributed basad of the cord.

The relationships of *Dasymolophilus* with *Tasiocera* Skuse seem evident. The genus *Dasymolophilus* is based on the combination of venation, presence of macrotrichiæ in the distal cells of the wing, and presence of a single dististyle in the male hypopygium. Certain New Zealand species of *Molophilus* have macrotrichiæ in the distal cells of the wing, while other members of the same genus have but a single dististyle (*M. monostylus* Alexander, of Chile). Despite these points of contact there can be little question of the validity of the group.

MOLOPHILUS NIGRIPES Edwards.

Molophilus nigripes EDWARDS, Ann. & Mag. Nat. Hist. IX 8 (1921) 104.

A male specimen from the type locality (Noko, Formosa, altitude 9,800 feet, June 26, 1927, *S. Issiki*).

The specimen agrees entirely with Edward's description. The male hypopygium has not been adequately described. Male hypopygium (Plate 2, fig. 15) with the dorsal lobe of the basistyle, *b*, developed only as a low obtuse lobe; mesal lobe broadly flattened, the tip obtuse; ventral lobe appearing as a long cylindrical structure that is provided with large scattered setæ and microscopic setulæ. Outer dististyle, *d*, slenderer, appearing as a pale straight rod the tip a little expanded, blunt, provided with six or seven small denticles. Inner dististyle of approximately the same length, dilated at base, gradually narrowed to the acute tip, the outer margin before apex microscopically setulose. Ædeagus slender, a little longer than the dististyles.

MOLOPHILUS NOKONIS sp. nov.

Belongs to the *M. gracilis* group and subgroup; general coloration plumbeous black; antennæ short, black; halteres dirty yellow; wings with a brownish suffusion; vein 2d A short; male hypopygium with ventral lateral portion of the basistyle produced into a needlelike spine; inner dististyle a sinuous black rod, the apex with conspicuous spinous teeth.

Male.—Length, about 3.2 millimeters; wing, 4 to 4.2.

Female.—Length, about 3.6 millimeters; wing, 4.8.

Rostrum and palpi black. Antennæ black throughout, relatively short, if bent backward extending approximately to the wing root. Head dark gray.

General coloration of the thorax dull plumbeous black, in cases with the anterior lateral pretergites and humeral triangles restrictedly brightened; pseudosutural foveæ shiny black. Halteres dirty yellow. Legs with the coxæ and trochanters yellowish testaceous; femora obscure yellow basally, passing into dark brown; tibiæ and tarsi light brown, passing into darker brown outwardly. Wings with a brownish suffusion, the base and costal region more yellowish; veins pale brown; macrotrichiæ dark brown. Venation: R_{2+3} only gently arcuated; R_2 in alignment with r-m; petiole of cell M_3 more than twice m-cu; vein 2d A relatively short, ending just before m-cu.

Abdomen black, the hypopygium yellowish brown. Male hypopygium (Plate 2, fig. 16) with the basistyles, *b*, relatively

short and stout, the dorsal lobe (not shown in figure) relatively small and stout, provided with setæ and delicate setulæ to the apex; ventromesal lobe very large, fleshy, conspicuously setiferous, a little constricted at base; ventrolateral region of the style produced into a long acicular spine, its base a little expanded. Outer dististyle, *d*, glabrous, very broadly dilated at base, soon narrowed into a flattened blade, in lateral aspect appearing to be a long acute spine; from what appears to be the basal portion of this style arises a smaller, nearly straight spine. Inner dististyle blackened, sinuous, the basal portion a little more enlarged, the apex provided with conspicuous spinous teeth, the apex acute. Ædeagus elongate. Ovipositor with the valves long and slender, the tergal valves blackened basally, the slender gently upcurved tips pale horn yellow; sternal valves long and straight.

Habitat.—Formosa.

Holotype, male, Noko, altitude 7,000 to 9,000 feet, June 26, 1927 (*S. Issiki*). Allotopotype, female, altitude 8,000 feet, June 26, 1927. Paratopotype, 2 males, with the allotype.

MOLOPHILUS ISSIKII sp. nov.

Belongs to the *Molophilus gracilis* group and subgroup; general coloration dark brownish gray; antennæ short, dark brown; halteres yellow; wings with a yellowish brown tinge; vein 2d A moderately elongate; abdomen, with hypopygium, black; male hypopygium with the dorsal lobe of the basistyle very much reduced, two ventral lobes, the outer a slender flattened spine; both dististyles acute at tips.

Male.—Length, about 4.2 millimeters; wing, 5.2.

Rostrum and palpi black. Antennæ dark brown throughout, relatively short, if bent backward scarcely attaining the wing root; flagellar segments oval with long conspicuous verticils. Head dark brownish gray.

Mesonotum dark brownish gray, clearer gray on the scutellum and postnotum; anterior lateral pretergites whitish; pseudosutural foveæ blackened. Pleura plumbeous black. Halteres yellow, the central portion of the stem a trifle darker, the elongate knobs brightening into citron yellow. Legs with the coxæ and trochanters testaceous yellow; femora dark brown, the bases obscure yellow; tibiæ and tarsi dark brown. Wings with a faint yellowish brown tinge, the base clearer yellow; veins pale brown, the abundant macrotrichiæ darker brown. Venation: R_{2+3} gently arcuated, longer than R_{4+5}; petiole

of the deep cell M_3 a little more than twice m-cu; vein 2d A relatively long but nearly straight beyond the basal fourth, extending to about opposite one-fourth the length of the second section of M_{3+4}.

Abdomen, including the hypopygium, blackened. Male hypopygium (Plate 2, fig. 17) with the basistyle, *b*, unusually large; dorsal margin not produced into a lobe, appearing merely as a low yellow ridge, the margin crenulate (not shown in figure); ventromesal lobe relatively small, with comparatively few long setæ and numerous microscopic setulæ; ventrolateral region of the style produced caudad into a slender, gently sinuous flattened blade, the tip acute, the surface microscopically roughened; between these two ventral lobes of the basistyle a powerful, strongly curved, black rod; mesal lobe of basistyle larger than the ventromesal, with more delicate setæ. Outer dististyle a glabrous structure, strongly curved into an elongate spinous tip. Inner dististyle, *d*, approximately as long, less strongly curved, gradually narrowed into a long spine, the surface with rather numerous punctures. Ædeagus relatively small.

Habitat.—Formosa.

Holotype, male Noko, altitude 9,800 feet, June 26, 1927 (*S. Issiki*).

This very distinct species of *Monophilus* is named in honor of the collector, Prof. Syuti T. Issiki, distinguished student of the Mecoptera of eastern Asia.

MOLOPHILUS EDITUS sp. nov.

General coloration of mesonotum plumbeous brown, the anterior part of the præscutum castaneous; pleura testaceous yellow, especially the sternopleurite; antennæ black; halteres dark brown; wings with a brownish suffusion; vein 2d A short.

Female.—Length, about 4 millimeters; wing, 4.4 to 4.5.

Rostrum and palpi brownish black. Antennæ black throughout; flagellar segments truncate-oval to subcylindrical, with verticils that exceed the segments. Head dark plumbeous gray.

Mesonotum posteriorly pale brown, with plumbeous reflections, the præscutum in front brightening into castaneous, this including the broad lateral margins, the humeral triangles, and the cephalic portion of the sclerite. Pleura testaceous yellow, the posterior sclerites a little more plumbeous. Halteres dark brown. Legs with the coxæ yellowish testaceous;

trochanters yellow; remainder of legs passing into dark brown, the femoral bases a little paler. Wings with a brownish suffusion, the base and costal region more yellowish; veins brown, more yellowish in the flavous areas above described; macrotrichiæ rather bright brown. Venation: R_2 lying shortly proximad of the level of the basal section of R_5; m-cu oblique in position, a little less than one-half the petiole of cell M_3; vein 2d A short, ending about opposite the caudal end of m-cu.

Abdominal tergites dark brown, the sternites more yellowish brown. Ovipositor with the valves long and slender, the tergal valves gently upcurved to the acute tips, the sternal valves a trifle stouter, straight.

Habitat.—Formosa.

Holotype, female, Noko, altitude 8,000 feet, June 26, 1927 (*S. Issiki*). Paratopotype, female.

Molophilus editus is distinguished from the other Formosan species of the genus by the combination of thoracic coloration, dark antennæ and halteres, and uniformly unfumed wings.

ORMOSIA DIPLOTERGATA sp. nov.

General coloration of thorax light reddish brown, the præscutum unmarked; antennæ (male) short; halteres light yellow; legs obscure yellow, clothed with dark setæ, the outer segments brown; wings pale brown, the stigma dark brown; cell 1st M_2 open by the atrophy of the basal section of M_3; vein 2d A elongate, sinuous; male hypopygium with the gonapophyses hairy; ninth tergite appearing as two superimposed flattened plates.

Male.—Length, about 3.6 millimeters; wing, 4.5.

Rostrum and palpi dark brown. Antennæ short, dark brown, the scapal segments a little paler; flagellar segments oval with long conspicuous verticils. Head brownish gray, with long yellow setæ.

Pronotum and mesonotum light reddish brown, the anterior lateral pretergites more yellowish; posterior sclerites of the notum a little more plumbeous. Pleura slightly plumbeous. Halteres light yellow. Legs with the coxæ obscure yellow; trochanters yellow; remainder of legs obscure yellow, with dark setæ, the outer segments passing into brown. Wings with a faint brown tinge, the conspicuous stigma dark brown; veins brown. Venation (Plate 1, fig. 18): Cell M_2 open by the atrophy of the basal section of M_3; m-cu at the fork of M;

vein 2d A elongate, sinuous, the cell narrowed just before the outer end.

Abdomen brown, the hypopygium somewhat brighter, yellowish brown. Male hypopygium (Plate 2, fig. 18) with the ninth tergite appearing double, there being two depressed median plates, one lying immediately above the other. Dististyle two, the outer very small, appearing as a gently curved structure, the outer surface somewhat squamose. Inner dististyle, *d*, much larger, pale, shaped as in the figure. Gonapophyses, *g*, two on either side, the larger pair appearing as flattened hairy structures that terminate in a long black spine; second pair of apophyses appearing as a slender black spine on either side.

Habitat.—Formosa.

Holotype, male, Higashinoko, altitude 7,500 feet, June 27, 1927 (*S. Issiki*).

ILLUSTRATIONS

[Legend; *a*, ædeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *i*, interbase; *p*, phallosome: R_{1+2}, $Radius_{1+2}$; *s*, 9th sternite; Sc_1, Sc_2, Subcosta; *t*, 9th tergite. Venational terminology used, Comstock-Needham-Tillyard, the radial field as modified by Alexander. Hypopygial terminology used, Crampton.]

PLATE 1

FIG. 1. *Paracladura cuneata* sp. nov., venation.
2. *Nesopeza trichopyga* sp. nov., venation.
3. *Nesopeza taiwania* Alexander, venation.
4. *Tipula sparsissima* sp. nov., venation.
5. *Tricyphona orophila* sp. nov., venation.
6. *Rhaphidolabis atripes* sp. nov., venation.
7. *Orimarga pruinosa* sp. nov., venation.
8. *Pseudolimnophila nokonis* sp. nov., venation.
9. *Limnophila* (*Tricholimnophila*) *excelsa* sp. nov., venation.
10. *Limnophila* (*Prionolabis*) *oritropha* sp. nov., venation.
11. *Eriocera issikii* sp. nov., venation.
12. *Elephantomyia luculenta* sp. nov., venation.
13. *Gnophomyia laterospinosa* sp. nov., venation.
14. *Gonomyia* (*Ptilostena*) *pallens* sp. nov., venation.
15. *Gonomyia* (*Lipophleps*) *ptilostenoides* sp. nov., venation.
16. *Gonomyia* (*Gonomyia*) *gilvipennis* sp. nov., venation.
17. *Dasymolophilus nokoensis* sp. nov., venation.
18. *Ormosia diplotergata* sp. nov., venation.

PLATE 2

FIG. 1. *Paracladura cuneata* sp. nov., male hypopygium.
2. *Nesopeza trichopyga* sp. nov., male hypopygium, lateral.
3. *Nesopeza trichopyga* sp. nov., base of antenna.
4. *Nesopeza taiwania* Alexander, base of antenna.
5. *Tipula lackschewitziana* sp. nov.. male hypopygium, lateral; 5*a*, outer dististyle of male hypopygium, caudal.
6. *Tipula nokonis* sp. nov., male hypopygium, lateral.
7. *Tipula nokonis* sp. nov., ninth tergite, dorsal.
8. *Tipula sparsissima* sp. nov., male hypopygium, lateral.
9. *Tricyphona orophila* sp. nov., male hypopygium.
10. *Rhaphidolabis atripes* sp. nov., male hypopygium.
11. *Limnophila* (*Prionolabis*) *oritropha* sp. nov., male hypopygium.
12. *Gnophomyia laterospinosa* sp. nov., male hypopygium.
13. *Gonomyia* (*Ptilostena*) *pallens* sp. nov., male hypopygium.
14. *Gonomyia* (*Gonomyia*) *gilvipennis* sp. nov., male hypopygium.
15. *Molophilus nigripes* Edwards, male hypopygium.
16. *Molophilus nokonis* sp. nov., male hypopygium.
17. *Molophilus issikii* sp. nov., male hypopygium.
18. *Ormosia diplotergata* sp. nov., male hypopygium.

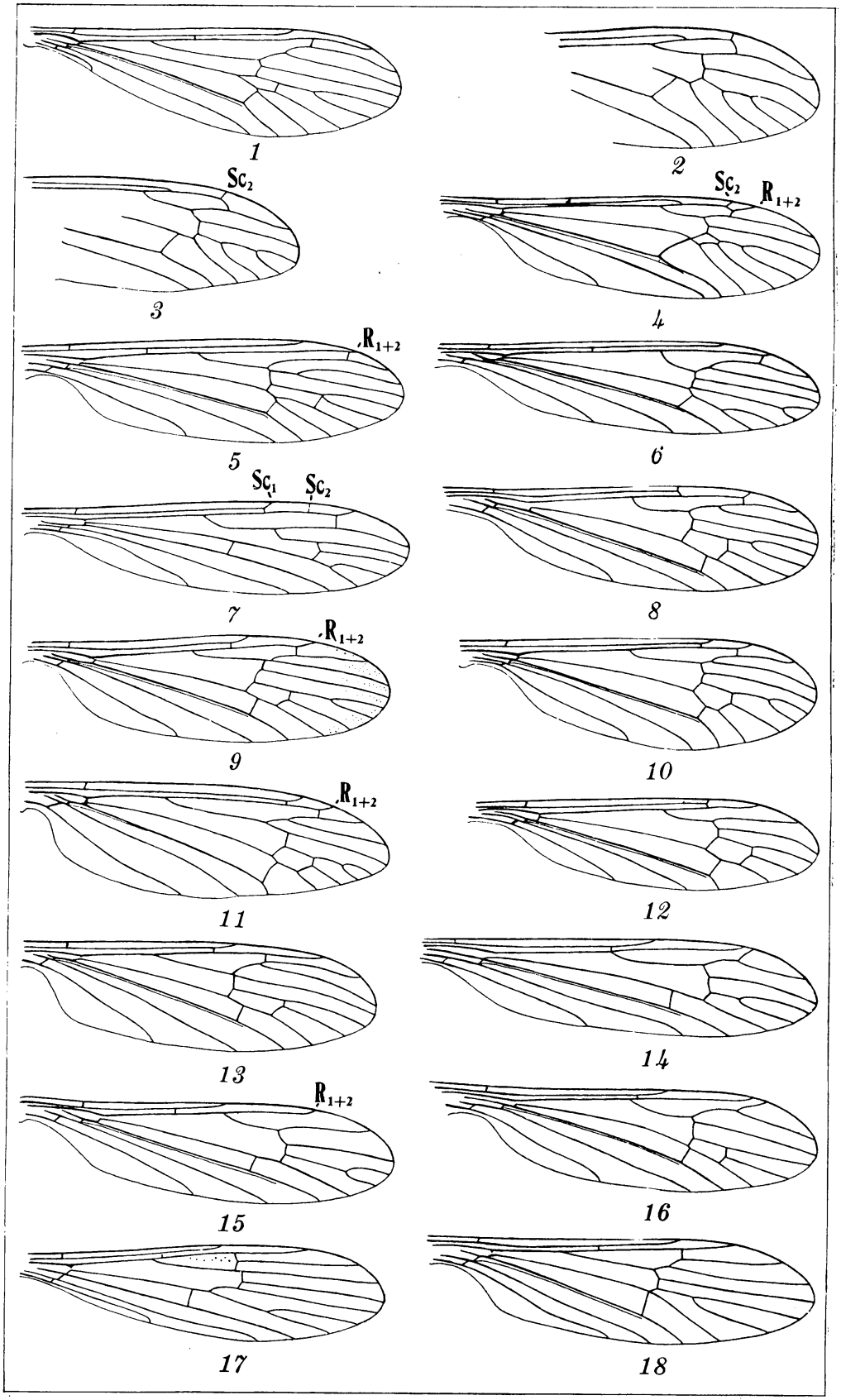

PLATE 1.

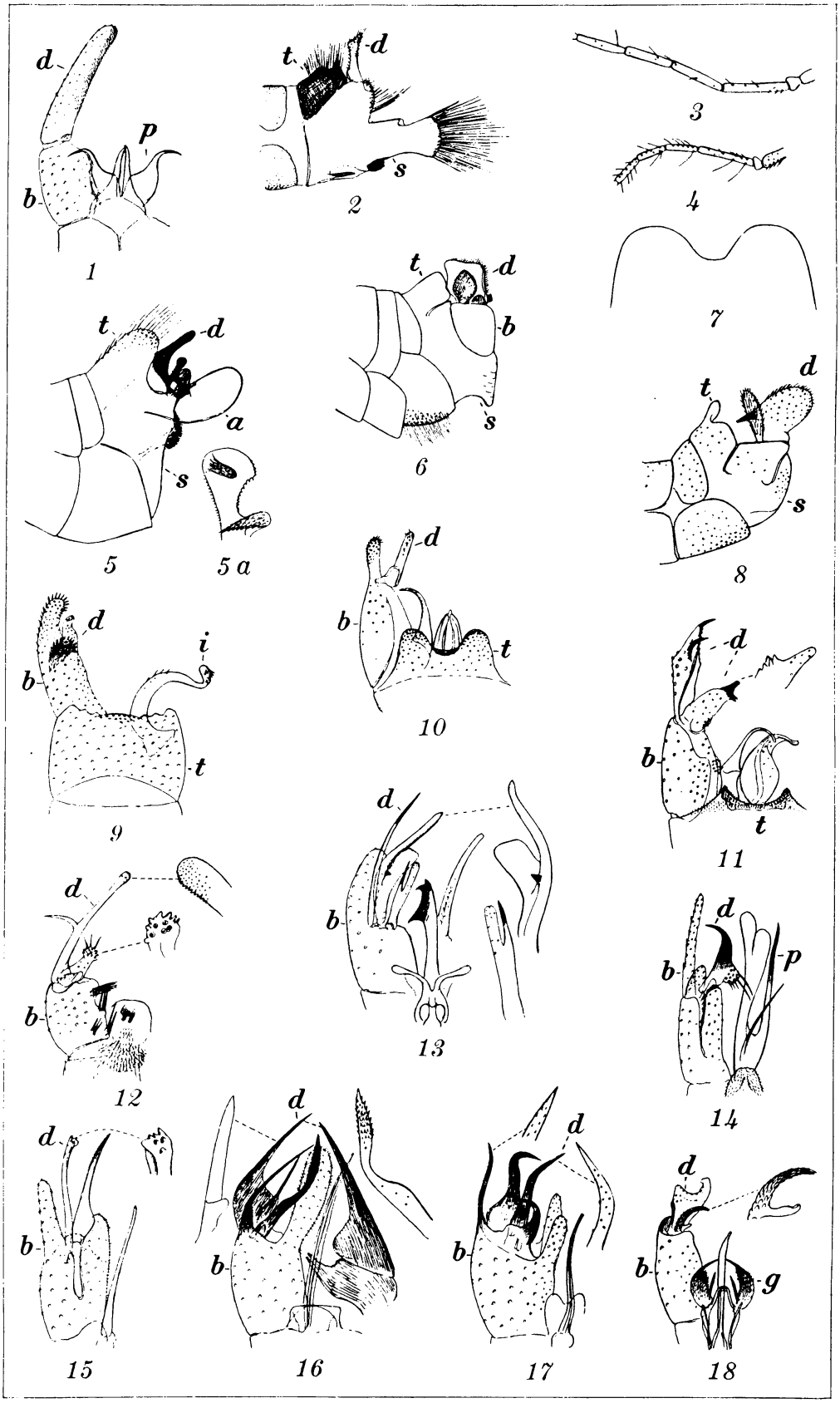

PLATE 2.