

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

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TWO PLATES

The species considered at this time are virtually all from the mountains of Formosa, where they were collected chiefly by Prof. Syuti Issiki. An additional Formosan species was included in the extensive collections of crane flies made in August, 1921, by Prof. Teiso Esaki. A few species are from Kiushiu and Shikoku Islands, Japan, where they were collected by Messrs. Issiki and Uyē. One interesting form that is made the type of a new genus, *Riedelomyia*, was included in the very extensive collections of the Indian Museum, Calcutta, kindly loaned to me for study by the custodians, Messrs. Chopra and Singh Pruthi. I wish to thank all of the above-mentioned students for this kind coöperation in making known the very involved tipulid fauna of the Orient. Except where stated to the contrary, the types of the novelties herein described are preserved in my collection.

In this paper and all others prepared subsequent to 1926, I have adopted the modification of the radial field of the wing suggested by myself in other papers, especially in the extended account published in 1927.² At the same time, the rearrangement of tribes and subtribes based on the apparent phylogenetic relationships of the groups is adopted, this arrangement placing the Tipulinæ and the Cylindrotominæ at the beginning of the consideration and in much closer relationship to the tribe Limoniini than was realized earlier.

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

² Proc. Linn. Soc. New South Wales 52 (1927) 42-72, 92 figs.

TIPULINÆ

NESOPEZA CIRCE sp. nov.

General coloration brown; antennæ pale; wings gray with an extensive brown pattern, each mark bordered by a conspicuous whitish ring; a circular marginal area in cell 1st A remote from the veins; Sc_1 far before the tip of Sc_2 ; R_2 and r in perfect transverse alignment; forks of media short.

Male.—Length, about 9.5 millimeters; wing, 8.8.

Female.—Length, about 12 millimeters; wing, 11.

Rostrum and palpi dark brown. Antennæ with the scapal segments brown; flagellar segments pale yellow, vaguely darkened outwardly; flagellar segments cylindrical. Head grayish brown.

Pronotum dark brown. Mesonotal præscutum brownish testaceous with three darker brown stripes, the median one broad; scutum brownish testaceous, each lobe with two darker brown areas, the posterior one larger; scutellum brown, narrowly margined with brownish testaceous; postnotum brown, paler laterally. Propleura, anepisternum, sternopleurite, and meron dark brown, the pteropleurite and pleurotergite paler, more testaceous brown. Halteres long, pale yellow, the knobs dark brown. Legs with the fore coxæ dark brown, the remaining coxæ a little paler; trochanters pale yellow; remainder of legs broken. Wings with the ground color gray, with an extensive bright brown pattern, each marking broadly and conspicuously bordered with white to produce a remarkably beautiful pattern; cell C and outer end of cell Sc whitish. The brown areas are distributed as follows: Prearcular region except a small white spot before h; a large postarcular cloud, including all the cells except C, sparsely variegated with white in the bases of cells M, 1st A, and 2d A; a large area at near one-third the length of cell R; origin of Rs; a conspicuous band along the cord, completely traversing the wing but almost interrupted at M; wing tip in cells R_2 , R_3 , R_5 , and M_1 , each of these with a conspicuous white inclosed area near outer end; a large circular marginal area in cell 1st A, remote from either vein, inclosing a tiny white nucleus which lies on the wing margin; tips of veins M_2 , M_3 , M_4 , and 2d A, with small brown spots, similarly encircled with white; a small area on Sc_1 ; veins brown. A single small obliterative area traverses the basal section of M_{1+2} near midlength. Venation (Plate 1, figs. 1, 1a): Sc_1 far before the tip of Sc_2 , the latter nearly twice m-cu; Rs relatively

short, angulated and weakly spurred at origin, subequal to R_3 ; R_{2+3} about one-half R_3 ; basal section of R_2 long, perpendicular, in alignment with the similarly transverse r , the distal section of R_2 entirely atrophied; distal section of R_1 without macrotrichia; R_3 gently arcuated; forks of the radial veins relatively short.

Abdominal tergites brown, variegated laterally at base with restricted yellow markings; outer segments more uniformly darkened; sternites dark, segments 3 and 4 with a conspicuous yellow crossband on the posterior half, the extreme caudal margins of the segments narrowly blackened. In the female, the pale coloration is dirty white and less evident. Ovipositor with short, stout valves, the sternal valves ending in short needlelike points.

Habitat.—Formosa.

Holotype, male, Mount Rantaizan, altitude 4,000 feet, June 2, 1927 (*S. Issiki*). Allotopotype, female.

Nesopeza circe is very distinct from all described members of the genus. The details of venation, especially the position of Sc_1 , together with the transverse alignment of r and the basal section of R_2 , are noteworthy features.

TIPULA TETRACANTHA sp. nov.

General coloration dark, the base of the abdomen yellowish; antennal flagellum bicolorous, dark, the base of each segment yellow; wings yellowish brown, the stigma brown; male hypopygium with the outer dististyle a strongly curved rod that terminates in an acute spine; inner dististyle a flattened blade, the outer margin near base bearing two acute black spines.

Male.—Length, about 13 millimeters; wing, 17; antennæ, about 4.5.

Described from an alcoholic specimen.

Frontal prolongation of the head relatively short, obscure yellow, narrowly darkened medially; nasus long and slender; palpi pale. Antennæ of moderate length; scapal segments pale; flagellar segments dark brown, the basal enlargement of each segment yellow; only twelve antennal segments, the last very small. Vertex dark, the genæ pale.

Mesonotum dark, any pruinosity normally present invisible in the alcoholic type. Pleura dark, the pteropleurite and pleurotergite paler; dorsopleural region pale. Halteres pale. Legs long and slender; fore coxæ dark, the middle coxæ dark except

basally, the posterior coxæ pale; trochanters pale yellow; femora obscure yellow, the tips narrowly but conspicuously dark brown; tibiæ obscure yellow, darker outwardly, the tips dark brown; tarsi elongated, passing into dark brown. Wings with a yellowish brown suffusion, the base and cells C and Sc more yellowish; stigma oval, brown; oblitative areas relatively conspicuous, including one in the outer end of cell R, crossing cell 1st M_2 into the extreme base of cell M_3 ; veins brown. Venation: Basal section of R_2 very reduced; distal section entire; petiole of cell M_1 short, a trifle longer than m ; cell 2d A relatively narrow.

Abdomen with the basal segments yellowish, the subterminal segments passing into pale brown, the outer segments, including the hypopygium, blackened. Male hypopygium of moderate size, the tergite entirely separate from the sternite; basistyle fused with the sternite except beneath. Ninth tergite (Plate 2, fig. 13, *t*) long, narrowed outwardly, the apex terminating in two blackened subspinulose lobes that are separated from one another by a small V-shaped notch. Outer dististyle (Plate 2, fig. 13, *o*) a strongly curved, flattened, semichitinized blade that narrows to an acute black spine. Inner dististyle a broadly compressed yellow blade, the outer ventral margin armed with two conspicuous black spines (Plate 2, fig. 13, *i*). Ninth sternite with an acute notch from which hang ventrad two slender fleshy lobes that bear conspicuous yellow setæ. Eighth sternite unarmed.

Habitat.—Japan.

Holotype, male, Shikoku, July 4, 1926 (*S. Issiki*).

CYLINDROTOMINÆ

LIOGMA PECTINICORNIS sp. nov.

General coloration pale yellow, the præscutum and scutum conspicuously marked with black; flagellar segments with long apical pectinations; wings nearly hyaline, the stigma pale brown.

Male.—Length, about 9 millimeters; wing, 9; antenna, about 4. Described from an alcoholic specimen.

Rostrum pale yellow; palpi pale. Antennæ with the scapal segments yellow, the flagellum a little darker; antennæ (Plate 2, fig. 22) sixteen-segmented, with thirteen branched segments, the formula being $2 + 13 + 1$; all flagellar segments except the last with a conspicuous slender branch at the extreme apex

of the segment, the longest (on flagellar segments 4 and 5) nearly as long as the segment; last branch short, scarcely one-fourth the segment; segments with conspicuous elongate verticils, including a group of four or five on the outer face of the segment before the branch; each branch terminates in two elongate setæ, that of the longest approximately two-thirds the branch; terminal segment elongate, simple. Head above brownish black, the remainder obscure yellow.

Pronotum and mesonotum pale yellow, the præscutum with three shiny black stripes, the lateral stripes crossing the suture onto the scutal lobes. Pleura yellow. Halteres pale. Legs with the coxæ and trochanters yellow; remainder of legs brownish yellow, with dark setæ, the terminal tarsal segments darker. Wings nearly hyaline, the stigma pale brown; veins dark brown. Venation: Sc_1 not reaching the margin, appearing as a long spur; Sc_2 opposite midlength of the basal section of R_{4+5} ; tip of R_1 vaguely indicated; tip of R_2 atrophied; r-m short but distinct, m-cu close to the fork of M.

Abdomen light brown, the sternites paler.

Habitat.—Formosa.

Holotype, male, Musha, altitude about 3,500 feet, October 5, 1926 (*S. Issiki*).

Liogma pectinicornis marks the most extreme tendency toward serration of the antennæ in the *Cylindrotominæ* that has yet been discovered.

LIMONIINÆ

LIMONIA FRAUDULENTA sp. nov.

Thoracic dorsum shiny black; head obscure yellow, the vertex infuscated; antennæ moniliform; dorsal pleurites black, the ventral sclerites abruptly yellow; wings with a strong brown suffusion, the stigma darker; male hypopygium with the dorsal dististyle very reduced; tips of the gonapophyses obtuse.

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

Described from an alcoholic specimen.

Rostrum and palpi very short, rostrum yellow; palpi dark brown and apparently only two-segmented. Antennæ with the first scapal segment obscure yellow, the remainder of the organ dark brown; basal flagellar segments subglobular, a little broader than long, distinctly separated so as to appear moniliform; outer segments passing into oval; terminal segment elongate, pointed at apex. Head pale yellow, the vertex infuscated, paling into yellow behind.

Pronotum pale yellow in front, shiny black behind. Mesonotum entirely shiny black; pleura black dorsally, abruptly pale yellow ventrally, the latter color including the sternopleurite and meron. Halteres dusky, the knobs obscure yellow. Legs with the coxæ and trochanters yellow; femora obscure yellow, the tips infuscated; tibiæ brownish yellow, the tips narrowly infuscated, tarsi obscure brownish yellow, the terminal segment blackened. Wings with a strong brownish suffusion, the oval stigma darker brown; veins dark brown. Venation (Plate 1, fig. 2): Sc long, Sc₁ ending just beyond midlength of Rs, Sc₂ at its tip; Rs about twice the basal deflection of R₄₊₅; distal section of R₁ and basal section of R₂ in approximate transverse alignment; cell 1st M₂ relatively small, shorter than the veins beyond it; m-cu subequal to the distal section of Cu₁, placed shortly before the fork of M.

Abdominal tergites dark brown; sternites similar, the caudal margins of the intermediate segments narrowly yellowish; subterminal segment brownish yellow; hypopygium dark. Male hypopygium (Plate 2, fig. 14) with the ninth tergite low, the caudal margin gently emarginate. Basistyle relatively slender, the mesal lobe very large. Ventral dististyle smaller than the basistyle, fleshy, the rostral prolongation long and conspicuous, near its base with a small tubercle that bears two closely approximated pale spines. Dorsal dististyle reduced to a very small, slender rod. Ædeagus broad, with very broad subtending lateral wings. Gonapophyses stout, flattened, their tips obtuse.

Habitat.—Formosa.

Holotype, male, west side of Mount Daibu, altitude 3,000 to 5,000 feet, mid-March, 1927 (*S. Issiki*).

In its polished black thorax, *Limonia fraudulenta* bears a conspicuous superficial resemblance to species of *Dicranomyia* of the *morio* group.

LIMONIA REMISSA sp. nov.

General coloration pale ochreous, anterior vertex silvery; mesonotal præscutum with three darker brown stripes; a dorsal longitudinal brown stripe on the thoracic pleura; wings pale brownish yellow with an extensive pattern of brown spots and seams; Sc long.

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

Described from an alcoholic specimen.

Rostrum and palpi black. Antennæ with the first scapal segment black, the second a little paler; flagellum pale brown; flagellar segments oval, passing into elongate-oval; terminal segment elongate, nearly twice the penultimate. Anterior vertex silvery gray, with a small median tubercle; head behind blackened, the median area more silvery.

Pronotum pale ochreous above, dark brown laterally. Mesonotum pale ochreous, the præscutum with three darker brown stripes; scutal lobes and scutellum dark brown, the median area of the former paler; postnotum dark. Pleura yellow with a broad dark brown longitudinal stripe that extends from the cervical sclerites across the dorsal pleurites to the postnotum, including the pleurotergite; sternopleurite a little infuscated ventrally. Halteres relatively elongate, pale, the knobs infuscated. Legs with the coxæ obscure yellow; trochanters brownish yellow; femora brownish yellow, clearer yellow basally, the tips narrowly darker brown; tibiæ and tarsi darker brown, especially the distal segments of the latter. Wings with a pale brownish yellow suffusion, darker in the costal region and base of cell R; an extensive rich brown pattern, consisting of large spots and seams that are diffuse and poorly delimited, including the following: Base of cells R and M; a large area at origin of Rs, not reaching M; a smaller cloud at end of Sc, extending from the costa posteriorly almost across cell 1st R₁; the stigmal spot completely fusing with a broad seam along the cord and with conspicuous dusky seams that fill cells 2d R₁ and R₃ excepting a large pale spot beyond the stigma; a broad seam on the outer end of cell 1st M₂; large diffuse spots at ends of veins M₃, M₄, Cu₁, and the anal veins, becoming larger toward the wing base; veins pale brown, paler in the ground areas. Venation: Sc long, Sc₁ ending about opposite three-fifths the long Rs, Sc₂ not far from its tip; Rs angulated and short-spurred at origin; tip of R₁ in approximate alignment with R₂; cell 1st M₂ elongate, nearly as long as vein M₁₊₂ beyond it; m-cu a little shorter than the distal section of Cu₁, placed shortly before the fork of M.

Abdominal tergites dark brown, the incisures restrictedly pale; sternites 1 to 4 with the basal third or more conspicuously pale yellow. Male hypopygium (Plate 2, fig. 15) with the basistyle relatively large, the mesal lobe large, obtuse. Ventral dististyle smaller than the basistyle, pale, the apex bilobed, the outer or lateral portion setiferous, the inner portion larger,

produced mesally into a flattened beaklike rostrum; on the side of this inner lobule an oval area that is densely set with conspicuous tawny setæ; outer face of the rostrum with a similar fringe of setæ. Dorsal dististyle a relatively slender, curved chitinized rod, the tip acute, decurved. Gonapophyses very broad and flattened, the mesal apical angle produced caudad into a nearly straight slender lobe. *Ædeagus* broad.

Habitat.—Formosa.

Holotype, male, Musha, altitude about 3,500 feet, October 5, 1926 (*S. Issiki*).

LIMONIA EBRIOLA sp. nov.

General coloration dark brown; antennæ dark brown throughout; halteres and legs dark brown; wings with a strong brown suffusion, the stigma and seams on the transverse veins darker brown; male hypopygium with the spines of the rostral prolongation of the ventral dististyle long, slender, widely separated.

Male.—Length, about 6.2 millimeters; wing, 8.

Rostrum and palpi dark brown. Antennæ dark brown; flagellar segments oval, becoming more elongate-oval outwardly, with long conspicuous verticils. Head dark brown.

Pronotum dark brown. Mesonotum brown, the præscutal stripes somewhat darker brown, the surface sparsely yellowish pollinose, brighter sublaterally. Pleura dark brown, the surface pruinose, leaving narrow longitudinal stripes of the ground color on the sternopleurite and across the ventral anepisternum and pteropleurite; dorsopleural region broadly paler brown. Halteres dark brown, the base of the stem yellow. Legs with the fore coxæ brown, remaining coxæ yellow; trochanter yellow; remainder of legs dark brown, the femoral bases a little brighter. Wings with a strong brown suffusion, the oval stigma darker brown; narrow but conspicuous brown seams at origin of R_s , along the cord and outer end of cell 1st M_2 ; veins dark brown. Venation (Plate 1, fig. 3): Sc relatively short, Sc_1 ending about opposite one-third the length of R_s , Sc_2 not far from its tip. R_s weakly angulated near extreme origin; tip of R_1 distinct but pale; r and basal section of R_2 meeting angularly; cell 1st M_2 relatively short, rectangular, shorter than the veins issuing from it; $m-cu$ close to the fork of M .

Abdominal tergites brownish black; basal sternites yellowish brown, the caudal margins brighter; subterminal segments brighter; hypopygium dark. Male hypopygium (Plate 2, fig. 16) with the caudal margin of the ninth tergite produced into

two obtuse lobes that are conspicuously setiferous. Basistyle of moderate size, its mesal lobe large. Dorsal dististyle a strongly curved sickle-shaped hook. Ventral dististyle large and fleshy, with numerous microscopic setulæ and more sparse long setæ; rostral prolongation stout, the two slender spines widely separated; outer spine arising from a short enlarged base, gently curved; inner spine a little shorter and more nearly straight; space between the spines with sparse erect setulæ. Gonapophyses pale, broadly expanded, the mesal apical angle produced into a long, slender, gently curved rod.

Habitat.—Formosa.

Holotype, male, Mount Rantaizan, altitude 6,000 feet, June 3, 1927 (*S. Issiki*).

DICRANOMYIA CINGULIFERA sp. nov.

General coloration dark brown; rostrum relatively elongate; antennæ dark brown, the second segment pale yellow; pleura silvery gray with two longitudinal dark brown stripes; halteres yellow, the knobs dark brown; femora obscure yellow with a dark brown subterminal ring; wings whitish subhyaline, heavily variegated with dark brown, especially beyond the cord; Sc elongate; abdomen brownish black, the segments ringed caudally with silvery gray.

Female.—Length, 5.5 to 6 millimeters; wing, 5 to 5.8.

Rostrum relatively elongate, approximately as long as, or a little longer than, the remainder of the head, black; palpi black. Antennæ with the first scapal segment dark brown; second segment pale yellow; flagellum dark brown, the segments short-oval, the outer segments smaller and more nearly globular; terminal segment longer, the apex pointed. Head brownish gray.

Pronotum brown, with a yellowish pollen. Mesonotal præscutum yellowish gray, clearer gray laterally, with four narrow dark brown stripes, the intermediate stripes narrower, separated from one another by a slightly narrower line of the ground color; a circular brown spot near the lateral margin behind the pseudosutural foveæ; scutum yellowish gray, the centers of the lobes darker; scutellum and postnotum brownish gray, the latter darker behind. Pleura silvery gray, variegated with two longitudinal dark brown stripes, the narrow dorsal stripe crossing the ventral propleura and anepisternum, the broader ventral stripe including the ventral portion of the sternopleurite. Hal-

teres pale yellow, the knobs dark brown. Legs with the coxæ brown, paler apically, the fore coxæ more reddish brown; trochanters yellowish testaceous; femora obscure yellow with a relatively broad dark brown subterminal ring, the extreme tip narrowly pale yellow; tibiæ and basitarsi brownish yellow, the tips narrowly infuscated; remainder of tarsi darker brown. Wings whitish subhyaline, the base and costal region a trifle more yellowish; a conspicuous dark brown pattern that is much heavier beyond the cord; seams on h; Sc₂; a large spot beyond arculus; an elongate rectangular area at origin of Rs, extending from costa almost to M, including the tip of Sc₁; stigma short-oval to subrectangular, connected with a narrow seam along the cord; outer ends of cells 2d R₁ and R₃ heavily infuscated; a narrow seam on outer end of cell 1st M₂; marginal brown spots on veins M₁₊₂, M₃, and M₄; smaller similar spots on Cu₁ and 1st A; a large marginal spot on vein 2d A; veins pale, darker in the infuscated areas. Venation: Sc₁ ending just beyond the origin of Rs, Sc₂ far from its tip, at near mid-distance between arculus and origin of Rs; Rs weakly angulated at origin; tip of R₁ and base of R₂ in approximate transverse alignment; cell 1st M₂ elongate-rectangular, subequal to vein M₁₊₂ beyond it; elements closing the cell very faint; m-cu close to the fork of M, a little shorter than the distal section of Cu₁.

Abdomen brownish black, the segments broadly and conspicuously ringed caudally with silvery gray; base of genital segment blackened; valves of ovipositor relatively small, nearly straight, reddish horn color.

Habitat.—Formosa.

Holotype, female, Mount Rantaizan, altitude 7,000 feet, June 2, 1927 (*S. Issiki*). Paratopotypes, two females, with the type; one female, 6,000 feet, June 3, 1927.

DICRANOMYIA FRIVOLA sp. nov.

Female.—Length, about 6.5 millimeters; wing, 7.6, its greatest width, 2.2.

Belongs to the *pulchripennis* group, most closely allied to *D. shirakii* Alexander, from which it differs especially in the broader wings with the white ground color more extensive.

Antennal flagellum weakly bicolorous, the ground color of the basal segments obscure yellow, the outer segments brownish black with the bases narrowly pale. Femoral tips, tibial bases, and tibial tips broadly and conspicuously blackened. Wings

broad, as shown by the above measurements; whitish, the extreme base a little more yellowish; costal pattern as in *shirakii*, with five extensive costal blotches, the first three of which are entire and more or less T-shaped, the caudal extension of each blotch in cell R being much narrower than the dilated costal portion; the white ground color separating these dark costal areas wider than in *shirakii*; cell R_3 and the cephalic portion of R_5 with clearly defined, relatively small, dark brown spots that do not tend to become confluent; cells 2d M_2 , M_3 , and M_4 with the ground color more extensive, the dark pattern more contrasted.

The cells of the wing are wider than in *shirakii* due to the greater breadth of the wing; cell 1st M_2 relatively short, its lower face shorter than vein M_4 beyond it; m-cu more than one-half its length before the fork of M.

Habitat.—Formosa.

Holotype, female, Mount Rantaizan, altitude 7,000 feet, June 3, 1927 (S. Issiki).

DICRANOMYIA NESOMORIO sp. nov.

Belongs to the *morio* group; male hypopygium with the caudal margin of the ninth tergite bearing two widely separated slender lobes; mesal lobe of basistyle long and slender; dorsal dististyle bifid at apex.

Male.—Length, about 5 to 5.5 millimeters; wing, 6 to 6.8.

Rostrum and palpi black. Antennæ black throughout; flagellar segments oval, the outer segments becoming more elongate-oval. Head black, the anterior vertex silvery, the posterior vertex narrowly grayish.

Pronotum black, sparsely pruinose. Mesonotum shiny black, especially the præscutum; median region of scutum, scutellum, and postnotum more pruinose. Pleura black, heavily silvery pruinose. Halteres elongate, dark brown, the base of the stem narrowly pale. Legs with the fore and middle coxæ brownish black, pruinose, paler apically, the posterior coxæ uniformly pale; trochanters reddish yellow; remainder of the legs black, the femoral bases restrictedly obscure yellow. Wings with a strong brownish tinge, the oval stigma darker brown; very vague and narrow dusky seams on the cord; veins darker brown. Venation: Sc_1 ending just beyond the origin of the long Rs; distal section of R_1 weakly preserved, lying a little basal of the equally pale basal section of R_2 , r thus being preserved and

provided with two or three macrotrichiaë; cell 1st M_2 closed, a little shorter than vein M_{1+2} beyond it; m-cu subequal to the distal section of Cu_1 , lying shortly before the fork of M .

Abdomen black, the caudal margins of the tergites broadly brown; sternites black, the caudal margins of segments 2 to 5 broadly yellowish brown; hypopygium dark. Male hypopygium (Plate 2, fig. 17) with the ninth tergite having the caudal margin terminating in two long slender lobes, widely separated by a broad U-shaped notch, the tips of the lobes with conspicuous setæ. Basistyle relatively small, dark, bearing a small subterminal tubercle on dorsal mesal margin; mesal lobe very long and slender, narrowed gradually to the subacute apex, paler than the remainder of the style. Ventral dististyle larger than the basistyle, fleshly, the rostral prolongation bearing a single stout pale spine near base. Dorsal dististyle gently curved, the tip bifid, the outer spine obtuse, the inner spine acute. Gonapophyses small.

Habitat.—Formosa.

Holotype, male, Mount Rantaizan, altitude 6,000 feet, June 2, 1927 (*S. Issiki*). Paratopotype, male; paratype, male, Rengechi, altitude 1,500 to 2,000 feet, end of March, 1927 (*S. Issiki*).

Genus **PROTOHELIUS** novum

Rostrum short, not produced; palpi four-segmented, conspicuous, the terminal segment nearly twice the penultimate, slender. Antennæ sixteen-segmented; flagellar segments long-cylindrical, gradually decreasing in length and diameter outwardly; terminal segment about one-half the penultimate; verticils relatively inconspicuous, not longer than the segments. Anterior vertex relatively narrow, about one-third wider than the diameter of the first scapal segment, subequal in both sexes; eyes relatively large and protuberant, with delicate ommatidia. Pronotum relatively massive. Legs comparatively stout; no tibial spurs; claws simple; empodia distinct. Wings (Plate 1, figs. 5, 5a) broad; Sc long, Sc_1 ending beyond midlength of R_{8+2} , Sc_2 about opposite the fork of Rs ; tip of R_1 preserved; r short; basal section of R_2 preserved, perpendicular or even slightly recurrent at origin, the distal section preserved, without macrotrichiaë; tips of Sc_1 , R_1 , and R_2 all relatively close together at wing margin; R_{2+3} a little longer than the basal section of R_{4+5} ; cell 1st M_2 closed, irregularly pentagonal; m-cu at the

fork of M, subequal to the distal section of Cu₁; cell 2d A wide; h very faint, oblique. Male hypopygium (Plate 2, fig. 18) with the basistyle short and stout. Outer dististyle broad-based, narrowed into an elongate blackened tip, on the mesal face near midlength with a short blunt blackened lobe. Inner dististyle of almost the same length and form as the outer, terminating in a long pale outer lobe and bearing a shorter lateral fleshy lobe on mesal face near base. Phallosome modified into a cylindrical structure. Ovipositor with the valves long and straight, the tips of the tergal valves gently upcurved.

Genotype, *Protohelius issikii* sp. nov. (Oriental Region.)

Protohelius is of extreme importance in that it indicates the manner in which the radial field in the more-aberrant subtribes of the Limoniini (such as the Heliaria, Dicranoptycharia, Tonnoiromyaria, and Aphilimnobararia) may have been derived. From a study of this genus, it appears that it is usually the free tip of R₁ that atrophies, leaving the distal end of R₂ persistent.

PROTOHELIUS ISSIKII sp. nov.

General coloration yellow, the thoracic dorsum extensively shiny black; wings broad, grayish brown, the stigma darker; abdomen dark brown, the basal sternites yellow.

Male.—Length, about 8.5 millimeters; wing, about 10.

Female.—Length, about 10 to 10.5 millimeters; wing, 10.5 × 3.2.

Described from alcoholic specimens.

Rostrum pale, the palpi dark brown, the terminal segment paler apically. Antennæ with the scapal segments brownish yellow, the flagellum dark brown. Head dark brown, paler beneath.

Pronotum yellow. Mesonotum almost covered by a shiny black dorsal shield, the lateral margins of the præscutum broadly yellow; central portion of the transverse suture pale; lateral margins of the scutal lobes and the parascutella pale yellow. Pleura pale yellow, including the pleurotergite, the ventral sternopleurite darkened. Halteres pale, the knobs weakly darkened. Legs relatively stout; coxæ and trochanters yellow; femora yellow basally, passing into dark brown; remainder of legs yellowish brown, the terminal tarsal segments darker brown; tarsal segments 3 and 4 each with a stout spinous bristle near apex. Wings broad, with a grayish brown suffusion,

the prearcular region more yellowish; cells Sc and Cu₁ darker; stigma brown; veins darker than the ground color. Venation (Plate 1, figs. 5, 5a) as discussed under the genus.

Abdomen dark brown, the basal sternites yellow, the intermediate sternites with the lateral margins pale; hypopygium pale. Female with the genital segment horn yellow, the valves darker.

Habitat.—Formosa.

Holotype, male, Rengechi, altitude 1,500 to 2,000 feet, end of March, 1927 (*S. Issiki*). Allotopotype, female. Paratopotypes, one male, one female.

This peculiarly interesting type of crane fly is named in honor of my friend Prof. Syuti Issiki, to whom I am greatly indebted for coöperation in studying the crane flies of Japan and Formosa.

HELIUS RUFITHORAX sp. nov.

Rostrum elongate; head dark gray; mesonotum and pleura shiny ferruginous, without markings; wings grayish subhyaline, the base and costal region more yellowish; abdominal tergites with the distal segments uniformly blackened, this including the hypopygium.

Male.—Length (excluding rostrum), about 7.5 millimeters; wing, 8.6; rostrum, 2.8.

Female.—Length (excluding rostrum), about 8 millimeters; wing, 9 to 9.5; rostrum, 2.8.

Rostrum elongate, approximately equal to the combined head and thorax, black throughout; palpi black. Antennæ brownish black, the second scapal segment a little paler. Head dark gray, the anterior vertex narrow.

Mesonotum shiny ferruginous, without markings. Pleura shiny yellowish ferruginous. Halteres pale, the knobs infuscated. Legs with the coxæ concolorous with the pleura; trochanters a little more yellowish testaceous; femora obscure yellow, the tips narrowly blackened; tibiæ obscure brownish yellow, the tips very narrowly darkened; tarsi brown, the terminal two segments darker. Wings grayish yellow subhyaline, the base and cells C and Sc clearer yellow; stigma oval, dark brown; wing tip in cells 2d R₁ and R₃ narrowly darkened; a narrow vague seam on the anterior cord; a conspicuous dusky seam along vein Cu; veins brown, brighter in the basal and costal regions. Venation: Sc₁ ending opposite the fork of Rs, Sc₂

at its tip; r-m distinct; cell 1st M_2 relatively broad, subrectangular; m-cu shortly beyond the fork of M.

Abdomen with the basal tergites brownish yellow, the caudal margins of the segments darkened; outer four or five segments, including the hypopygium, uniformly blackened. Female with the tergites uniformly dark brown, the basal sternites obscure brownish yellow.

Habitat.—Formosa.

Holotype, male, Mount Rantaizan, altitude 7,000 feet, June 4, 1927 (*S. Issiki*). Allotopotype, female, 6,000 feet, June 3, 1927. Paratopotype, female, with the type.

Helius rufithorax is allied to the smaller *H. tenuirostris* Alexander, differing in the longer rostrum, the uniform thorax, the unvariegated abdominal segments, black hypopygium, and other characters.

EURHAMPHIDIA INELEGANS sp. nov.

General coloration pale brown, the mesonotum darker; head dark; legs with the femoral tips yellow; tibial bases very narrowly pale; tips of the tibiæ and most of the tarsi white; wings subhyaline, the stigma pale brown; Sc relatively long, veins R_3 and R_{4+5} strongly divergent.

Female.—Length, about 6 millimeters; wing, 5.3.

Described from an alcoholic specimen.

Rostrum obscure yellow, the apex darker; palpi dark brown. Antennæ with the first scapal segment yellow, the second dark brown; flagellum pale brown, the outer segments broken. Head dark brown.

Pronotum pale brown, yellowish laterally. Mesonotum pale brown, the præscutum with a broad median and narrower lateral stripes of a darker color; remainder of mesonotum chiefly dark brown. Pleura obscure yellow, sparsely variegated with brown on the sternopleurite and pleurotergite. Halteres pale brown, the base of the stem brighter. Legs with the coxæ obscure yellow, the outer faces more or less infuscated; trochanters obscure brownish yellow; femora pale brown, the tips paling into yellow; tibiæ darker brown, the extreme bases vaguely paler, the tips whitened; tarsi pure white, excepting the terminal two segments which are infuscated. Wings (Plate 1, fig. 4) subhyaline; cells C and Sc a trifle more yellowish; stigma oval, relatively small, pale brown; veins brown. Wings relatively short and broad, more so than in *E. abnormalis*

(Brunetti), the cells correspondingly widened, the prearcular cells shortened. Vein M_4 without macrotrichia. Venation: Sc relatively long, Sc_1 ending about opposite one-fourth the second section of Rs , Sc_2 longer, ending about opposite one-third the same; second section of Rs approximately three-fourths the first; veins R_3 and R_{4+5} strongly divergent and relatively short, cell R_3 at margin wide; $m-cu$ at near two-thirds the length of cell 1st M_2 .

Abdominal tergites pale brown, the sternites obscure yellow. Ovipositor with the valves strongly infuscated; tergal valves straight, the tips a little upcurved.

Habitat.—Formosa.

Holotype, female, Musha, altitude about 3,500 feet, October 5, 1926 (*S. Issiki*).

Eurhamphidia inelegans has the pattern of the femora and bases of the tibiae much more obscured and ill-defined than either *E. niveitarsis* (Skuse) or *E. abnormalis* (Brunetti).

DICRANOPTYCHA FORMOSENSIS sp. nov.

General coloration brownish gray, the thoracic pleura pale with the anepisternum darker; legs yellow, the tips of the segments very narrowly and inconspicuously blackened; wings grayish yellow, the costal region clearer yellow; costal fringe short; male hypopygium with the outer dististyle densely set with short setae, terminating in an acute black spine; gonapophyses elongate, terminating in a unilateral brush of long setae.

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

Female.—Length, about 9.5 to 10 millimeters; wing, 10.2 to 10.5.

Rostrum reddish brown, the palpi dark brown. Antennae reddish brown, the outer segments darker, feebly bicolorous, the joints being paler than the central portion of each segment. Head brownish gray.

Mesonotal praescutum brownish gray, the median area of the praescutum somewhat brighter brown; pseudosutural foveae black; scutum brownish gray; scutellum a little more reddish brown, pruinose; postnotum more heavily pruinose. Pleura pale, the anepisternum darker, the surface sparsely pruinose, in the paratype more heavily so. Halteres pale yellow, the knobs scarcely darker. Legs with the coxae pale, very sparsely pruinose; trochanters yellow; remainder of legs yellow, the extreme tips of the femora on the outer face, the similarly narrow tips of the tibiae and basitarsi, and the terminal tarsal segments

brownish black. Wings with a grayish yellow suffusion, the prearcular and costal regions clearer yellow; veins brownish yellow; costal fringe (male) short. Venation: Rs from one-third to one-half longer than cell 1st M_2 ; m-cu at near midlength of cell 1st M_2 .

Abdomen with the basal tergite dark brown; remaining segments obscure yellow, dark brown laterally; a subterminal dark brown ring; hypopygium yellow; sternites similar, the basal segments obscure yellow. Male hypopygium (Plate 2, fig. 19) with the outer dististyle a compressed elongate blade, densely set with relatively short setæ, the apex of the style narrowed into a long curved black spine. Inner dististyle longer, appearing as a flattened, parallel-sided elongate rod, the tip obtuse, the inner face set with erect spinous setæ. Gonapophyses very conspicuous, appearing as long taillike rods that are provided just before their tips with very long spinous setæ, arranged to form a subapical unilateral brush.

Habitat.—Formosa.

Holotype, male, Ranrun, altitude 1,000 feet, June 2, 1927 (*S. Issiki*). Allotopotype, female. Paratopotype, female.

DICRANOPTYCHA GENICULATA sp. nov.

General coloration brownish black; ventral pleurites paler; legs yellow, the tips of the femora broadly brownish black; bases and tips of the tibiæ similarly blackened; wings brownish, the bases and costal region more yellowish; costal fringe short; abdomen brownish black, the hypopygium obscure yellow; male hypopygium with outer dististyle having the outer surface spinous; gonapophyses elongate, the surface smooth.

Male.—Length, about 10 millimeters; wing, 9 to 9.5.

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

Described from alcoholic specimens.

Rostrum brownish testaceous, the palpi dark brown. Antennæ dark brown throughout, relatively long in both sexes; first flagellar segment approximately twice the length of the second; succeeding segments gradually becoming more elongate to the penultimate, the terminal segment about two-thirds the penultimate; verticils conspicuous, exceeding the segments in length. Head dark brown, with long yellow setæ, the occiput paler.

Mesonotum dark brown, the humeral region of the præscutum brighter; in cases the cephalic portion of the præscutum is paler, the posterior portion being largely covered by three

brownish black stripes. Pleura dark, the ventral pleurites paler, obscure yellow. Halteres pale, the base of the knobs darker. Legs with the coxæ and trochanters yellow; femora yellow, the tips broadly brownish black, the amount subequal on all the legs (about 1.25 millimeters); tibiæ yellow with the base narrowly, the apex more broadly brownish black; tarsal segments 1 and 2 obscure yellow, the tips brownish black; terminal tarsal segments uniformly darkened; legs with long, conspicuous, semi-erect setæ. Wings with a strong brown suffusion, the base and costal region more yellowish, cell Sc clearer yellow than cell C, the outer costa and stigmal region more infumed; veins pale brown, more yellowish in the costal region and along vein Cu; costal fringe (male) short. Venation: Rs relatively short, subequal to cell 1st M_2 ; m-cu at or not far beyond the fork of M, the first section of M_{3+4} subequal to or shorter than r-m.

Abdomen brownish black, the hypopygium obscure yellow. Male hypopygium (Plate 2, fig. 20) with the outer dististyle a curved rod, the apex produced into a stout blackened point, the outer surface with conspicuous erect spinous tubercles that form a low crest, the spines becoming smaller basally. Inner dististyle short and stout, fleshy, a little shorter than the outer dististyle, provided with long conspicuous setæ. Gonapophyses long and slender, sinuous, the apex unarmed. Ovipositor with the valves very short; tergal valves with the distal half blackened.

Habitat.—Formosa.

Holotype, male, without exact locality data, October, 1926 (S. Issiki). Allotopotype, female. Paratopotype, male.

PROANTOCHA UYËI sp. nov.

General coloration obscure yellow, variegated with dark brown; all legs provided with short spinous setæ; posterior femora conspicuously flattened, the apical tooth low and obtuse; posterior tibiæ elongate, conspicuously clavate at tip, the basal tooth slender; wings whitish subhyaline, the costal region more yellowish.

Male.—Length, about 7 millimeters; wing, 10.5. Fore leg, femur, 6.7; tibia, 9; tarsus, about 4.6. Middle leg, femur, 6.8; tibia, 6.7; tarsus, about 2.9. Hind leg, femur, 7.2; tibia, 11.7; tarsus, about 2.7.

Other specimens show a range in length from about 6 to 7.5 millimeters, the wing, 9 to 11, with the measurements of the segments of the legs in proportion.

Rostrum obscure brownish yellow, the palpi dark brown. Antennæ with the basal segment brown, obscure yellow basally, the remainder of the organ dark brown; flagellar segments oval with short verticils and a short erect pubescence; terminal segment elongate. Head brownish gray, more yellowish on the orbits.

Pronotum dark brown, paler laterally. Mesonotal præscutum obscure yellow with three brown stripes, the median stripe becoming obsolete before the suture; lateral stripes paler than the median, crossing the suture onto the scutal lobes; scutum broadly pale medially; scutellum broad, pale, with a dusky spot on either side at base; postnotal mediotergite dark, pruinose medially and behind, with a small yellow spot on either side at base. Pleura brownish yellow, conspicuously variegated with dark brown on the propleura, ventral anepisternum, the ventral sternopleurite, the dorsal pteropleurite, and the meron; pleurotergite largely pale, the ventral portion darkened. In other specimens the pleura is more uniformly darkened. Halteres pale, the knobs more or less infuscated. Legs with the coxæ pale, narrowly darker basally, the posterior coxæ large; trochanters obscure yellow; remainder of legs dark brownish yellow, the tarsi beyond the base dark brown; proportions of the segments of the legs shown by the above measurements; fore and middle legs unmodified, provided with a dense vestiture of very short spinous setæ; fore tarsi longest; posterior femora conspicuously flattened, the apical tooth low and obtuse; tibiæ with a slender basal tooth, as in the males of this genus; posterior tibiæ conspicuously clavate at tip; posterior tarsi very short; claws toothed. Wings whitish subhyaline, the costal region more yellowish; stigma faintly indicated, elongate, pale brown; vein Cu indistinctly seamed with dusky; prearcular veins pale; costal veins yellowish, remaining veins dark brown. Venation: Veins strong; basal section of R_2 nearly in alignment with r-m; m-cu shortly before the fork of M.

Abdomen dark brown, the intermediate segments narrowly margined caudally and laterally with yellow; basal sternites obscure yellow; hypopygium brownish yellow. Male hypopygium generally similar in structure to the other members of the genus.

Habitat.—Japan.

Holotype, male, Yamaga, Oita-ken, Kiushiu, on the banks of the Yasakawaga, altitude 225 feet, April 22, 1927 (*Tenji Uyê*). Paratopotypes, four males, April 21–22, 1927.

This interesting crane fly is named in honor of the collector, Mr. Tenji Uyē, to whom I am indebted for many crane flies from Kiushiu. *Proantocha uyēi* is very peculiar in the extreme modifications of the legs. The short, spinous vestiture of the fore and middle, as well as the posterior legs, together with the flattened posterior femora and clavate tibiæ readily distinguish the species from the two members of *Proantocha* hitherto made known (*P. spinifer* Alexander and *P. serricauda* Alexander, of Japan).

TRICYPHONA KIRISHIMENSIS sp. nov.

General coloration pale brownish yellow; antennæ yellow; head and apex of abdomen dark brown; legs yellow, the tips of the femora and tibiæ narrowly darkened; wings pale yellowish brown, the costal cell darker; r-m connecting with R_{4+5} ; cell M_2 open.

Male.—Length, about 11.5 millimeters; wing, 13.6.

Described from an alcoholic specimen.

Rostrum and palpi brownish black. Antennæ sixteen-segmented, pale yellow, the extreme base of the first segment darkened, the terminal three or four segments dusky. Head dark brown.

Thorax pale brownish yellow, without distinct markings, the postnotum somewhat darker. Halteres relatively elongate, pale. Legs with the coxæ obscure yellow; trochanters brownish yellow; femora yellow, the tips narrowly dark brown; tibiæ brownish yellow, the tips narrowly dark brown; tarsi dark brown, the outer segments blackened. Wings with a pale yellowish brown suffusion, cell C more strongly infumed; stigma pale yellow, vaguely encircled by dusky; very restricted pale brown seams at origin of Rs and along the cord; veins dark brown. Venation (Plate 1, fig. 6): Sc_2 far before the origin of Rs, the latter angulated and spurred at origin; r-m connecting with R_{4+5} at near one-fourth the length; R^{2+3} elongate; R_{1+2} a little shorter than R_2 ; petiole of cell R_4 nearly equal to r-m; cell M_2 open by the atrophy of m; m-cu subequal to the distal section of M_{3+4} .

Abdominal tergites obscure brownish yellow, with a continuous narrow dark brown median stripe; outer segments and hypopygium passing into dark brown; sternites brownish yellow, the base of the individual segments narrowly clearer yellow. Male hypopygium with the dististyle very large, bilobed, each lobe slender, with no armature other than abundant setæ of

various lengths. Interbases appearing as long, slender, chitinized spines. *Æ*deagus and gonapophyses appearing as broad blades, their tips obtuse.

Habitat.—Japan.

Holotype, male, Mount Kirishima, Kiushiu, June 9, 1926 (*S. Issiki*).

The only similar Japanese species is *Tricyphona confluens* Alexander,³ which differs in having the antennæ and legs dark brown; r-m connecting with Rs before its fork, and in other characters.

TRICYPHONA FORMOSANA Alexander.

Tricyphona formosana ALEXANDER, Ann. Ent. Soc. America 13 (1920) 260–261.

The type, a male, was from Arisan, Formosa, collected April 24, 1927, by Doctor Shiraki. The following additional records of occurrence of this small and inconspicuous but highly interesting crane fly are given: West side of Mount Daibu, Formosa, altitude 3,000 to 5,000 feet, mid-March, 1927 (*S. Issiki*). Mount Rantaizan, altitude 7,000 feet, June 2, 1927 (*S. Issiki*). The wing venation is shown on Plate 1, fig. 7.

PSEUDOLIMNOPHILA DESCRIPTA sp. nov.

General coloration dark brown; antennæ black; halteres dusky; wings with a strong brown suffusion, the stigma darker; Sc short; R_2 arising from R_{2+3+4} ; cell M_1 lacking; cell 1st M_2 relatively short.

Female.—Length, about 6.5 millimeters; wing, 6.4.

Rostrum very short, dark brown; palpi black. Antennæ black throughout; flagellar segments with long conspicuous verticils that are more than twice as long as the segments bearing them. Head dark brown, the anterior vertex and narrow posterior orbits light gray.

Pronotum gray. Mesonotal præscutum brown, more grayish laterally, the humeral region a little brighter, the dorsum with three scarcely evident darker brown stripes; pseudosutural foveæ relatively pale, a little darker than the ground color; scutum dark brown; scutellum and postnotum more pruinose. Pleura dark, the surface sparsely pruinose. Halteres dusky, the stem restrictedly paler at base. Legs with the coxæ brownish testaceous, paler apically; femora brown, a little darker out-

³ Insec. Inscit. Menst. 10 (1922) 186–187.

wardly, the bases more yellowish brown; tibiæ brown, the tips weakly darker; terminal tarsal segments darker brown. Wings with a strong brown suffusion, the elongate-oval stigma darker brown; veins darker brown. Venation (Plate 1, fig. 8): Sc_1 ending before the fork of Rs, Sc_2 at its tip; Rs relatively long, gently arcuated at origin; R_{2+3+4} elongate; R_2 longer than R_{3+4} ; R_{1+2} more than twice R_2 alone; cell M_1 lacking; cell 1st M_2 relatively short, less than one-half cell 2d M_2 beyond it; m-cu just beyond the fork of M, shorter than the distal section of Cu_1 ; anterior arculus preserved.

Abdomen dark brown; sternites obscure yellowish brown. Ovipositor with the long valves darkened, the tips somewhat brighter colored.

Habitat.—Formosa.

Holotype, female, Mount Rantaizan, altitude 4,000 feet, June 2, 1927 (*S. Issiki*).

Genus LIMNOPHILA Macquart

Subgenus TRICHOLIMNOPHILA novum

Characters as in the genus, differing as follows: Antennæ ranging from short to moderately elongate (*platystyla*), in the latter case, the ventral face of the flagellar segments a little protuberant; longest verticils exceeding the segments in length. Pseudosutural foveæ and tuberculate pits both present. Legs with conspicuous trichiæ; tibial spurs distinct. Wings with Sc relatively short, Sc_1 ending shortly before the fork of Rs, Sc_2 not far from its tip; R_2 from one-third to one-half R_{1+2} and from one-half to two-thirds R_{2+3+4} ; inner ends of cells R_4 , R_5 , and 1st M_2 in subtransverse to oblique alignment, in the latter case with cell 1st M_2 lying more basad; cell M_1 present; m-cu shortly before midlength of cell 1st M_2 ; anterior arculus preserved. Distal cells of wing (R_2 to M_3) with macrotrichiæ; in some species, these even more abundant, including the distal end of cell M_4 or even Cu_1 and 1st A. Male hypopygium with the outer dististyle more or less compressed, notably so in *platystyla*, the apex bidentate; inner dististyle deeply bilobed. Ovipositor with the valves elongate, nearly straight.

Type of the subgenus, *Limnophila pilifer* Alexander. (Eastern Palæarctic Region.)

Other included species are *L. breviramus* Alexander, *L. flavella* Alexander and its variety *saitamæ* Alexander, *L. platystyla* sp.

nov. and *L. macrotrichiata* Alexander of Japan and Formosa, and *L. punctum* (Meigen) of Europe.

I had formerly considered the members of this group as being referable to the subgenus *Lasiomastix* Osten Sacken, but the male hypopygium of the latter is distinct, the basistyles being elongate and the inner dististyle simple.

LIMNOPHILA (TRICHO-LIMNOPHILA) PLATYSTYLA sp. nov.

General coloration brown, usually dark brown; antennæ (male) relatively elongate, the flagellar segments with their lower faces bulging; wings grayish, with abundant macrotrichiæ in the outer cells; male hypopygium with the outer dististyle very broad, greatly compressed.

Male.—Length, about 5.5 millimeters; wing, 6 to 6.2; antenna, about 2.3.

Female.—Length, about 6 millimeters; wing, 6 to 6.1.

Rostrum dark brown; palpi black. Antennæ with the basal segment of the scape reddish brown; flagellum dark brown; antennæ (male) relatively elongate, as shown by the measurements; flagellar segments with their lower faces protuberant, the surface with a delicate erect white pubescence and a few verticils. Head dark brown, the anterior vertex paler.

Mesonotal præscutum varying from yellowish brown to dark brown, darkest medially, the surface sparsely dusted; pseudo-sutural foveæ black; scutal lobes likewise varying from yellowish brown to dark brown, the median area a little paler than the lobes; scutellum and postnotum pale brown, the surface sparsely pruinose. Pleura dark brown, the dorsal region of the sternopleurite paler to produce a broad vague paler stripe; dorsopleural region dusky. Halteres pale brown, the base of the stem restrictedly obscure yellow, the knobs infuscated. Legs with the coxæ and trochanters obscure yellow; femora obscure yellow, the tips scarcely darkened; tibiæ brownish yellow, the tips weakly infuscated; tarsi passing into dark brown. Wings with a strong grayish suffusion, the small stigma a little darker; veins dark brown. Macrotrichiæ of cells abundant, including all distal cells from R_2 to Cu, inclusive, in some specimens even including the outer end of cell 1st A. Venation: R_2 about one-third R_{1+2} and only a little shorter than R_{2+3+4} ; cell M_1 a little longer than its petiole; cell 1st M_2 small; m-cu variable in position, ranging from before to beyond midlength of the cell.

Abdomen, including the hypopygium, brownish black, the basal segments vaguely brightened except laterally. Male hypopygium (Plate 2, fig. 21) with the outer apical angle of the basistyle somewhat conically produced. Outer dististyle very broad, greatly compressed, the apex narrowly blackened, bifid, the outer spine more slender and less curved than the inner. Inner dististyle with the outer branch expanded at apex into an obtuse head which is densely set with conspicuous setiferous tubercles; inner branch small, likewise conspicuously setiferous.

Habitat.—Formosa.

Holotype, male, Mount Rantaizan, altitude 7,000 feet, June 2, 1927 (*S. Issiki*). Allotopotype, female. Paratopotypes, one male, two females.

ATARBA LEPTOXANTHA sp. nov.

Allied to *A. pallidicornis* Edwards in the general pale yellow coloration, with the femoral tips narrowly darkened, but the mesonotum is uniformly reddish yellow.

Male.—Length, 5 to 5.2 millimeters; wing, 6 to 6.3.

Female.—Length, 5.5 to 5.8 millimeters; wing, 6.8.

Rostrum and basal segments of the palpus yellow, the terminal palpal segments brownish black. Antennæ uniformly pale yellow. Head yellow.

Mesonotum reddish yellow, the sides of the præscutum paler, more yellowish testaceous. Pleura reddish yellow. Halteres pale yellow, the knobs brighter. Legs with the coxæ concolorous with pleura; trochanters yellow; femora light yellow, the tips very narrowly but conspicuously dark brown; tibiæ yellow, the tips even more narrowly and conspicuously infuscated; tarsi yellow, the terminal segments a little darker. Wings with a strong pale yellow suffusion, sometimes with faint brown streaks in the bases of cells C and Sc; veins brighter yellow. Venation as in *pallidicornis* but R_{3+4} shorter and straighter.

Abdomen brownish yellow, the terminal segments a little darker. In the female the tergites are pale brown, the sternites paler, weakly bicolorous, the apices of the segments being broadly but slightly infuscated.

Habitat.—Formosa.

Holotype, male, Tattaka, altitude about 7,400 feet, August 17, 1921 (*T. Esaki*). Allotype, female, Arisan, altitude 7,362

feet, August 24, 1921. Paratopotypes, three males, August 18, 1921.

CERATOCHEILUS FORMOSENSIS sp. nov.

General coloration dark brown; antennæ black; wings pale grayish; R_{2+3+4} long, gently sinuous; veins Cu and 1st A approximated basally for a short distance only; male hypopygium with the outer dististyle entirely blackened; gonapophyses elongate-filiform.

Male.—Length (excluding rostrum), about 4.3 millimeters; wing, 5.2; rostrum, about 4.

Rostrum elongate, almost as long as the remainder of the body, black throughout. Antennæ black. Head in front gray, the posterior vertex darker; anterior vertex of moderate width, at narrowest point approximately one-sixth the head; eyes more narrowly separated beneath, the exact distance uncertain because of a slight crushing of the head.

Mesonotal præscutum with three nearly confluent dark brown stripes; scutal lobes similarly colored; median region of scutum, the scutellum and postnotum a little paler, sparsely pruinose. Pleura dark brown, the dorsopleural membrane paler. Halteres pale, the knobs dusky. Legs with the coxæ and trochanters testaceous; remainder of legs passing into dark brown, the femoral bases narrowly paler. Wings with a pale grayish tinge, C and Sc a little brighter; veins pale brown. Macrotrichia on veins relatively long and abundant, distributed as follows: R_s , 1; basal section of R_5 about 7; distal section of the same very numerous and crowded, occurring the whole length of the vein; on distal sections of M_{1+2} and M_3 ; none on R_{2+3+4} . Venation (Plate 1, fig. 9): Sc_1 ending opposite the origin of R_s , the latter shorter than the basal section of R_5 ; R_{2+3+4} long, gently sinuous; vein R_5 powerful, diverging widely from the other branch of R_s ; cell 1st M_2 closed; m-cu just before the fork of M; approximation of veins Cu and 1st A slight.

Abdomen brown. Male hypopygium (Plate 2, fig. 25) with the ninth tergite bearing two low lateral lobes that are sparsely setiferous. Basistyle relatively short and stout; interbasal process pale, compressed, the flattened head obtuse. Dististyle entirely blackened, the outer lateral angle produced into a slender rod; surface of the style with a few microscopic setulæ,

smaller along the margin. Gonapophyses appearing as two elongate, filiform rods.

Habitat.—Formosa.

Holotype, male, Mount Rantaizan, altitude 6,000 feet, June 3, 1927 (*S. Issiki*).

LIPSOTHRIX TAIWANICA sp. nov.

General coloration pale brownish yellow, the præscutum with four darker brown stripes; legs pale, the tarsi whitened; wings strongly tinged with brown; basal section of R_5 strongly arcuated.

Male.—Length, 5.5 to 6 millimeters; wing, 6 to 6.8.

Described from alcoholic specimens.

Rostrum very small, pale; palpi pale brown. Antennæ pale, the outer segments darker; flagellar segments oval. Head pale brownish yellow.

Mesonotum obscure yellow, the præscutum with four brown stripes, the intermediate stripes separated only by a capillary pale vitta; scutal lobes conspicuously variegated with dark brown; scutellum pale at base, the apex dusky; postnotum pale. Pleura pale, the ventral pleurites a little darker. Halteres pale. Legs relatively long and slender; coxæ and trochanters pale; femora and tibiæ pale brown, the genua vaguely paler; tarsi paling to whitish, the claws black. Wings with a strong brown tinge, the center of the disk a little paler; veins darker than the ground color; macrotrichiæ dark brown, of moderate length only. Venation (Plate 1, fig. 10): Sc_1 ending about opposite one-third the length of R_{2+3+4} , Sc_2 near its tip; Rs relatively long; R_{2+3+4} longer than the basal section of R_5 ; R_2 a little longer than R_{1+2} ; R_{2+3} shorter than R_3 ; m shorter than the outer deflection of M_3 , in cases much shorter; m-cu at or close to the fork of M.

Abdomen pale brown, the basistyles more yellowish. Male hypopygium (Plate 2, fig. 26) with the basistyles relatively short and stout, the interbasal process appearing as a relatively slender pale rod. Outer dististyle heavily blackened, except at base, dilated outwardly, terminating in an acute spine; a second, slightly more curved spine on the mesal edge some distance from the tip, the space between these two spines appearing as a flattened blade. Inner dististyle pale with conspicuous setæ.

Habitat.—Formosa.

Holotype, male, west side of Mount Daibu, altitude 3,000 to 5,000 feet, mid-March, 1927 (*S. Issiki*). Paratopotypes, four males.

The discovery of a species of *Lipsothrix* in the Oriental Region is of considerable interest. *Limnophila sylvia* Alexander described from northeastern North America, should be transferred to *Lipsothrix*.

Genus RIEDELOMYIA novum

Rostrum short; palpi small, the terminal segment shorter than the penultimate. Antennæ (Plate 2, fig. 23) sixteen-segmented, the basal four to six segments of the flagellum closely united to form an elongate-conical fusion segment; first flagellar segment narrowed at base; segments 2 and 3 much wider than long; segment 4 a little longer than wide; remaining flagellar segments becoming elongate-cylindrical, the last segment longest; verticils of fusion segment relatively short and unilaterally arranged, on the outer segments becoming very long and conspicuous, between two and three times the segments; on the basal nine flagellar segments there are no outstanding verticils on the inner face of the segments; on the tenth and succeeding segments such a verticil is present, placed more distad than the verticils of the lateral face; terminal segment elongate, with four long terminal verticils. Vertex relatively wide. Pronotum massive. Pseudosutural foveæ large, elongate-oval; no tuberculate pits; meron greatly reduced. No tibial spurs; tarsi shorter than the tibiæ; tarsal claws relatively large, untoothed; arolia present. Wings (Plate 1, fig. 11) with Sc long, Sc₁ ending beyond the fork of Rs, Sc₂ some distance from the tip of Sc₁, being equal to or longer than m-cu alone; Rs long, strongly arcuated at origin, nearly in alignment with R₂₊₃₊₄; R₂ about two-thirds R₂₊₃₊₄ and about twice R₁₊₂ alone; cell R₂ very wide at margin; basal section of R₅ strongly arcuated; cell 1st M₂ closed, long to very long, m-cu close to the fork of M; veins Cu₁ and 2d A bent strongly into the wing margin; arculus pale but preserved. Ovipositor with relatively long valves, the tergal valves only gently upcurved.

Genotype, *Riedelomyia gratiosa* sp. nov. (Oriental Region.)

Other included species are *R. niveiapicalis* (Brunetti) of India and *R. teucholabina* (Alexander) of Fiji. This new group is named in honor of my old friend, Postamtrat M. P. Riedel, distinguished authority on the Tipulidæ.

The exact affinities of the species included in this new genus remain somewhat in doubt. The species hitherto described were placed in different genera of the Limoniini (*Dicranomyia* and *Limonia*) but a resemblance to *Teucholabis* was observed in the

case of both species. From a critical survey of the characters, as listed, it would now appear that the genus *Riedelomyia* should be placed in the Eriopterini in the general vicinity of *Teucholabis* and *Gonomyia*.

The first member of this group to be described was *Dicranomyia niveiapicalis* Brunetti⁴ from the North Canara District, Southwest India. The describer did not stress the essential characters of the fly, but in the same paper⁵ discussed a second specimen of the genus that was referred to *Teucholabis* with a query. The latter specimen has been restudied and is made the type of the genus under the name *Riedelomyia gratiosa* sp. nov. In his extremely valuable review of the Oriental Tipulidæ described by Brunetti, Edwards⁶ has reëxamined the type of *niveiapicalis*, has added further notes on the structure and coloration, and has indicated the relationship to *Teucholabis*. The probability that a new genus would be necessary to receive this fly was indicated.

The second species was described from Fiji as *Limnobia? teucholabina* Alexander⁷ and likewise was indicated as being an aberrant type that would probably require a new group for its reception. The antennæ of the latter species were not well preserved in the unique type specimen. The venation is about as in the genotype, differing as follows: Sc even longer, Sc₁ and R₁ close together at wing margin; cell R₂ not so wide, vein R₃ being strongly upcurved at outer end; cell 1st M₂ very elongate, longer than any of the veins issuing from it.

The construction of the fusion segment of the antennæ appears to vary rather surprisingly in the different species, and perhaps in the sexes of the same. *Riedelomyia niveiapicalis*, according to Edwards's observation on the dried type, has the basal six flagellar segments almost united into a large cone, the remaining segments of the flagellum very slender, with long verticils. *Riedelomyia gratiosa* has about four segments so involved in the fusion segment, while *R. teucholabina* would seem, from a study of the imperfectly preserved dried type, to have not more than three or four segments involved in the fusion.

⁴ Rec. Ind. Mus. 15 (1918) 285-286.

⁵ T. c. 306.

⁶ Rec. Ind. Mus. 26 (1924) 297.

⁷ Ann. & Mag. Nat. Hist. IX 8 (1921) 553-554.

RIEDELOMYIA GRATIOSA sp. nov.

? *Teucholabis* sp. BRUNETTI, Rec. Ind. Mus. 15 (1918) 306.

General coloration brown, the præscutum with four narrow dark brown stripes; pleura dark brown, with a narrow pale longitudinal stripe; wings grayish yellow, sparsely spotted with darker.

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

Rostrum brown; palpi brownish black. Antennæ (Plate 2, fig. 23) as described under the genus; scapal segments brown, the basal five or six segments of the flagellum orange, the remaining segments passing into dusky. Head brown.

Pronotum pale brown above, dark brown laterally. Mesonotal præscutum brownish yellow with four narrow dark brown stripes, the intermediate pair separated from one another by a subequal distance; sublateral stripes very short; lateral margins of the præscutum and scutal lobes narrowly darkened; remainder of mesonotum chiefly dark brown, the surface more or less yellowish gray pollinose; posterior portion of the postnotum pale. Pleura almost covered by two broad dark brown stripes, leaving only the dorsopleural region and a very narrow longitudinal stripe pale, yellowish pollinose; the dorsal brown stripe extends from the cervical sclerites to the pleurotergite, passing dorsad of the halteres; the ventral stripe extends from the fore coxæ to the base of the abdomen; the narrow pale dividing stripe extends from the extreme base of the fore coxa, passing across the dorsal sternopleurite and ventral pteropleurite to the posterior postnotum, including the base of the haltere. Halteres pale, the knobs weakly darkened. Legs with the fore coxæ infumed except at base, the remaining coxæ pale; trochanters yellow; only a single (posterior) leg remains; femora yellow, the tip narrowly but abruptly whitened, preceded by a slightly narrower brown ring; tibiæ yellow, the distal fifth paling into white; basitarsi white, the outer tarsal segments more yellowish. Wings with a grayish yellow suffusion, the base and cells C and Sc brighter; a heavy spotted brown pattern, distributed as follows: At h; arculus; origin of Rs, extending caudad to vein M; Sc₂; stigma; origin of basal section of R₅; remainder of cord and outer end of cell 1st M₂; small brown marginal clouds at ends of all the longitudinal veins except Sc₁. Paler grayish brown clouds as follows: A transverse series before the wing tip, extending from costa across cells R₂, R₄, and R₅; a conspicuous wash beyond midlength of cell M adjoining vein Cu₁;

smaller washes in the anal cells adjoining vein 2d A, including two in cell 2d A and one near the base of cell 1st A; veins yellow, dark brown in the infuscated areas. Venation (Plate 1, fig. 11) as defined under the genus.

Abdomen discolored, brown, the segments appearing darker brown laterally; sternites paler brown, darker laterally, the caudal margins narrowly pale.

Habitat.—India.

Holotype, female, Parambikulam, Cochin State, altitude 1,700 to 3,200 feet, September 16 to 24, 1914 (*F. H. Gravely*). Type in the collection of the Indian Museum.

The present species is allied to *R. niveiapicalis* (Brunetti), differing especially in the details of coloration and structure. The broad dark stripes of the thoracic pleura are very different in their arrangement. The type of *niveiapicalis* has not been studied, but Edwards describes the ventral stripe as extending from the neck to the base of the abdomen. In *gratiosa* this stripe extends from the fore coxa to the base of the abdomen, the dorsal stripe being the one that includes the neck and lateral propleura.

Genus TAIWANINA novum

Rostrum slender, approximately two-thirds as long as the remainder of the head, clothed with a very delicate pubescence and long scattered setæ; palpi greatly reduced or lacking. Antennæ (Plate 2, fig. 24) twelve-segmented, short, the scapal segments enlarged, especially the large, oval second segment; flagellum with only ten evident segments, the basal one a large fusion segment which is only slightly separated from the following segment; nine flagellar segments beyond the fusion segment, these short-cylindrical, becoming longer and more slender outwardly; outer segments very elongate, with conspicuous setæ, the terminal segment with the tip narrowed, provided with four long setæ; vestiture of the flagellar segments including three distinct types of setæ, very elongate verticils, a microscopic pubescence, and small setæ set in conspicuous punctures. Anterior vertex relatively narrow, approximately twice the diameter of the first scapal segment; eyes beneath narrowly contiguous. Pronotum of moderate size, hidden beneath the produced præscutum. Tuberculate pits present, placed close together at the cephalic margin of the præscutum; pseudosutural foveæ relatively large, lying close to the margin of the sclerite. Meron greatly reduced, the middle and posterior coxæ nearly contiguous.

Legs long and slender; no tibial spurs; setæ of legs simple; claws elongate, slender, simple except for an appressed spine on outer face at about three-fourths the length; arolia lacking. Wings (Plate 1, fig. 12) with Sc moderately long, Sc₁ ending shortly beyond midlength of Rs, Sc₂ a short distance from its tip; Rs relatively short, in alignment with the basal section of R₅; R₂₊₃₊₄ at origin subperpendicular to the end of Rs, thence gently sinuous to the margin; R₂ lacking; R₃ and R₄ fused to margin, obliterating cell R₃; r-m much shorter than the basal section of R₅; cell M₁ lacking; cell 1st M₂ closed, its inner end arcuated; m-cu at or beyond midlength of the cell, equal to or longer than the distal section of Cu₁; Cu₂ very conspicuous; anterior arculus lacking. Male hypopygium with the tergite produced medially, the apex obtusely rounded. Basistyles relatively short, the two dististyles nearly terminal in position; outer style a slender, nearly straight chitinized rod terminating in two decurved teeth of which the outer is smaller; inner dististyle longer, the outer half narrowed. Ædeagus and gonapophyses inconspicuous. Anal tube conspicuous.

Genotype, *Taiwanina pandoxa* sp. nov. (Oriental Region.)

Despite the loss of cell R₃ of the wing, the new genus *Taiwanina* appears to be placed correctly in one of the lower subtribes of the Eriopterini, near such groups as the Gonomyaria, Toxorhinaria, and Claduraria, with all of which it shows some features in common. The slightly elongated rostrum, with very reduced palpi, together with the structure of the antennæ, reminds one very strongly of the Toxorhinaria; but the setæ of the legs are simple and it seems probable that the relationship is not especially close. The combination of antennal and hypopygial structure, and the wing venation, separates this beautiful little fly as an isolated type. At first sight one is reminded by the venation and short rostrum of the subtribe Heliaria, but the structure of the antennæ and thorax renders such an assignment less probable.

TAIWANINA PANDOXA sp. nov.

General coloration black; pronotum and a longitudinal stripe on the thoracic pleura yellow; halteres yellow, the knobs dark brown; femora black, the bases yellowish; tibiæ orange, the base and apex white; basitarsi obscure orange, the base infuscated, remainder of tarsi white; wings strongly infumed, variegated with yellow, the costa broadly so; intermediate abdominal sternites with a whitish spot on either side at base.

Male.—Length, about 5 to 5.5 millimeters; wing, 5 to 7.2.

Rostrum and remainder of head black. Antennæ brownish black throughout.

Cervical sclerites black, brighter above. Pronotum light yellow. Mesonotal præscutum brown, darker behind, paling into yellowish brown in front, without evident pattern; tuberculate pits and pseudosutural foveæ nearly concolorous; remainder of mesonotum dark brown. Pleura brownish black with a conspicuous pale longitudinal stripe extending from the propleura, narrowed behind, ending beneath the wing root, posteriorly with the surface whitish pruinose. Halteres of moderate length, yellow, the knobs dark brown. Legs with the fore coxæ pale yellowish brown, darker apically, the remaining coxæ and all trochanters black; femora black, the bases broadly and conspicuously yellow, the middle femora almost entirely blackened; tibiæ bright orange, the base narrowly pure white, the apex more broadly of this color, the latter preceded by a more or less distinct darkened ring; basitarsi obscure orange, the extreme base infuscated, the apex and remainder of the tarsi pure white, the terminal segment a trifle more yellowish. Wings strongly infumed, the prearcular and costal regions broadly and conspicuously bright yellow, more rarely a trifle obscured, sending large caudal extensions caudad over the arculus, in cell R before Rs and in cell R₂ beyond Rs; conspicuous yellow marginal spots in outer ends of cells R₂ and R₄; small paler spots in outer ends of cells R₅, 2d M₂, M₃, and M₄; large geminate yellow spots at margin on either side of both anal veins; vague pale centers in the cells adjoining the cord; posterior arculus dark; veins pale brown, C, Sc, and R clear light yellow except where traversed by dark areas. Venation (Plate 1, fig. 12) as discussed under the genus; Rs relatively short, strongly arcuated to weakly angulated at origin; basal section of R₅ variable in length; cell R₄ strongly widened at outer end; anal veins bent abruptly into the margin.

Abdomen black; sternites 3 to 7 laterally at base with a conspicuous oval whitish spot; hypopygium dark, the tergal region paler. Male hypopygium as discussed under the genus.

Habitat.—Formosa.

Holotype, male, Mount Rantaizan, altitude 6,000 feet, June 7, 1927 (*S. Issiki*). Paratopotypes, two males, June 3 to 7, 1927; paratype, alcoholic male, Rengechi, altitude 1,500 to 2,000 feet, end of March, 1927 (*S. Issiki*).

Taiwanina pandoxa is a striking fly similar to no species so far described.

MOLOPHILUS PALLIDIBASIS sp. nov.

Belongs to the *gracilis* group; allied to *M. costalis* Edwards; antennæ whitish; mesonotum pale brown; wings with a grayish yellow tinge, the costal region brighter yellow; male hypopygium with the dorsal lobe of the basistyle a cylindrical fleshy lobe that is setiferous to the blunt apex.

Male.—Length, about 3.5 millimeters; wing, 4.3.

Described from an alcoholic specimen.

Rostrum and palpi brown. Antennæ with the first scapal segment dark, the remainder of the organ whitish. Head ochreous brown, the vertex a little darker.

Pronotum whitish above, darker laterally. Mesonotal præscutum pale brown, the præscutum with scarcely differentiated paler stripes. Pleura brown, the dorsopleural region whitened. Halteres dusky, the knobs a little more whitish. Legs with the coxæ and trochanters obscure yellow; remainder of legs obscure yellow, the tarsi passing into darker. Wings with a grayish yellow suffusion, the costal region brighter yellow; veins brownish yellow, those in the costal region brighter. Venation: R_2 lying proximad of the basal section of R_3 ; petiole of cell M_3 more than twice m-cu; vein 2d A ending about opposite m-cu.

Abdominal tergites brown, the sternites paler. Male hypopygium (Plate 2, fig. 27) with the dorsal lobe of the basistyle relatively long and slender, cylindrical setiferous to the tip; mesal lobe shorter and broader; a blunt setiferous tubercle near base of the style. Outer dististyle relatively slender, the base expanded, the remainder of the style heavily blackened, the tip narrowed into an acute curved spine; surface of the style with microscopic appressed spinules. Inner dististyle subequal in length to the outer, sinuous, the apex a little widened, obtuse, the inner margin produced into a small spinous point; inner margin of the stem with a few microscopic spinules.

Habitat.—Formosa.

Holotype, male, west side of Mount Daibu, altitude 3,000 to 5,000 feet, mid-March, 1927 (*S. Issiki*).

MOLOPHILUS ALBOCOSTALIS sp. nov.

Belongs to the *gracilis* group; allied to *M. costalis* Edwards; antennæ whitish; mesonotum dark brown, the lateral margins conspicuously yellowish white; wings tinged with brown, the costal margin whitish; a small dark brown spot on the anterior

arculus; male hypopygium with the dorsal lobe of the basistyle a flattened glabrous blade, the tip obtusely rounded.

Male.—Length, about 2.6 to 3 millimeters; wing, 3.3 to 4.2.

Rostrum and palpi dark brown. Antennæ with the basal five or six segments whitish, the outer segments more infuscated. Head yellow, the center of the vertex with a large oval dark brownish gray spot.

Pronotum yellowish white, darker laterally; anterior lateral pretergites yellowish white. Mesonotal præscutum brownish gray, the lateral margins yellowish white; remainder of mesonotum dark brown. Pleura dark brown. Halteres dusky, the base of the stem restrictedly paler. Legs with the coxæ dusky, the middle and hind coxæ a trifle more yellowish; trochanters yellowish testaceous; remainder of legs dark brown, the tarsal segments darker. Wings with a brownish tinge, the costal margin whitish; a small dark brown spot on the anterior arculus; veins pale brown, yellowish in the costal region; macrotrichiæ dark brown. Venation: R_2 lying proximad of the basal section of R_5 ; petiole of cell M_1 more than twice m-cu; vein 2d A relatively short, ending some distance before m-cu.

Abdomen dark brown, the hypopygium brighter. Male hypopygium (Plate 2, fig. 28) with the basistyle relatively long and slender, the dorsal lobe a flattened glabrous blade, the apex broadly rounded; mesal lobe much shorter, obtuse, provided with a few conspicuous setæ; mesal tubercle of the basistyle lying on distal half of the style. Outer dististyle a slender blackened rod, narrowed gradually to the acute curved apex, the surface with abundant microscopic appressed spinules. Inner dististyle longer and broader, near midlength markedly constricted, the apical half narrowed to the acute tip, this expanded headlike portion with abundant microscopic spinules.

Habitat.—Formosa.

Holotype, male, Mount Rantaizan, altitude 7,000 feet, June 2, 1927 (*S. Issiki*). Paratopotypes, several males.

Molophilus costalis Edwards (Plate 2, fig. 29) and *M. arisanus* Alexander (Plate 2, fig. 30) are readily distinguished from the two allied species described at this time by the elongate spinous dorsal lobe of the basistyle of the male hypopygium. The structure of the styli of these four Formosan species is shown in Plate 2, figs. 27 to 30.

ILLUSTRATIONS

[Legend: *b*, basistyle; *i*, interbase; *o*, outer dististyle; *R*, radial vein and its branches; *Rs*, radial sector; *t*, tergite. Venational terminology used, Comstock-Needham-Tillyard, as modified by Alexander. Hypopygial terminology used, Crampton.]

PLATE 1

- FIG. 1. *Nesopeza circe* sp. nov., wing.
1a. *Nesopeza circe* sp. nov., detail of radial field of wing.
2. *Limonia fraudulenta* sp. nov., wing.
3. *Limonia ebriola* sp. nov., wing.
4. *Eurhamphidia inelegans* sp. nov., wing.
5. *Protohelius issikii* gen. et sp. nov., wing.
5a. *Protohelius issikii* gen. et sp. nov., detail of radial field of wing.
6. *Tricyphona kirishimensis* sp. nov., wing.
7. *Tricyphona formosana* Alexander, wing.
8. *Pseudolimnophila descripta* sp. nov., wing.
9. *Ceratocheilus formosensis* sp. nov., wing.
10. *Lipsothrix taiwanica* sp. nov., wing.
11. *Riedelomyia gratiosa* gen. et sp. nov., wing.
12. *Taiwanina pandoxa* gen. et sp. nov., wing.

PLATE 2

- FIG. 13. *Tipula tetracantha* sp. nov., details of male hypopygium.
14. *Limonia fraudulenta* sp. nov., male hypopygium.
15. *Limonia remissa* sp. nov., male hypopygium.
16. *Limonia ebriola* sp. nov., male hypopygium.
17. *Dicranomyia nesomorio* sp. nov., male hypopygium.
18. *Protohelius issikii* gen. et sp. nov., male hypopygium.
19. *Dicranoptycha formosensis* sp. nov., male hypopygium.
20. *Dicranoptycha geniculata* sp. nov., male hypopygium.
21. *Limnophila (Tricholimnophila) platystyle* sp. nov., male hypopygium.
22. *Liogma pectinicornis* sp. nov., antenna of male.
23. *Riedelomyia gratiosa* gen. et sp. nov., antenna of female.
24. *Taiwanina pandoxa* gen. et sp. nov., antenna of male.
25. *Ceratocheilus formosensis* sp. nov., male hypopygium.
26. *Lipsothrix taiwanica* sp. nov., male hypopygium.
27. *Molophilus pallidibasis* sp. nov., male hypopygium.
28. *Molophilus albocostalis* sp. nov., male hypopygium.
29. *Molophilus costalis* Edwards, male hypopygium.
30. *Molophilus arisanus* Alexander, male hypopygium.

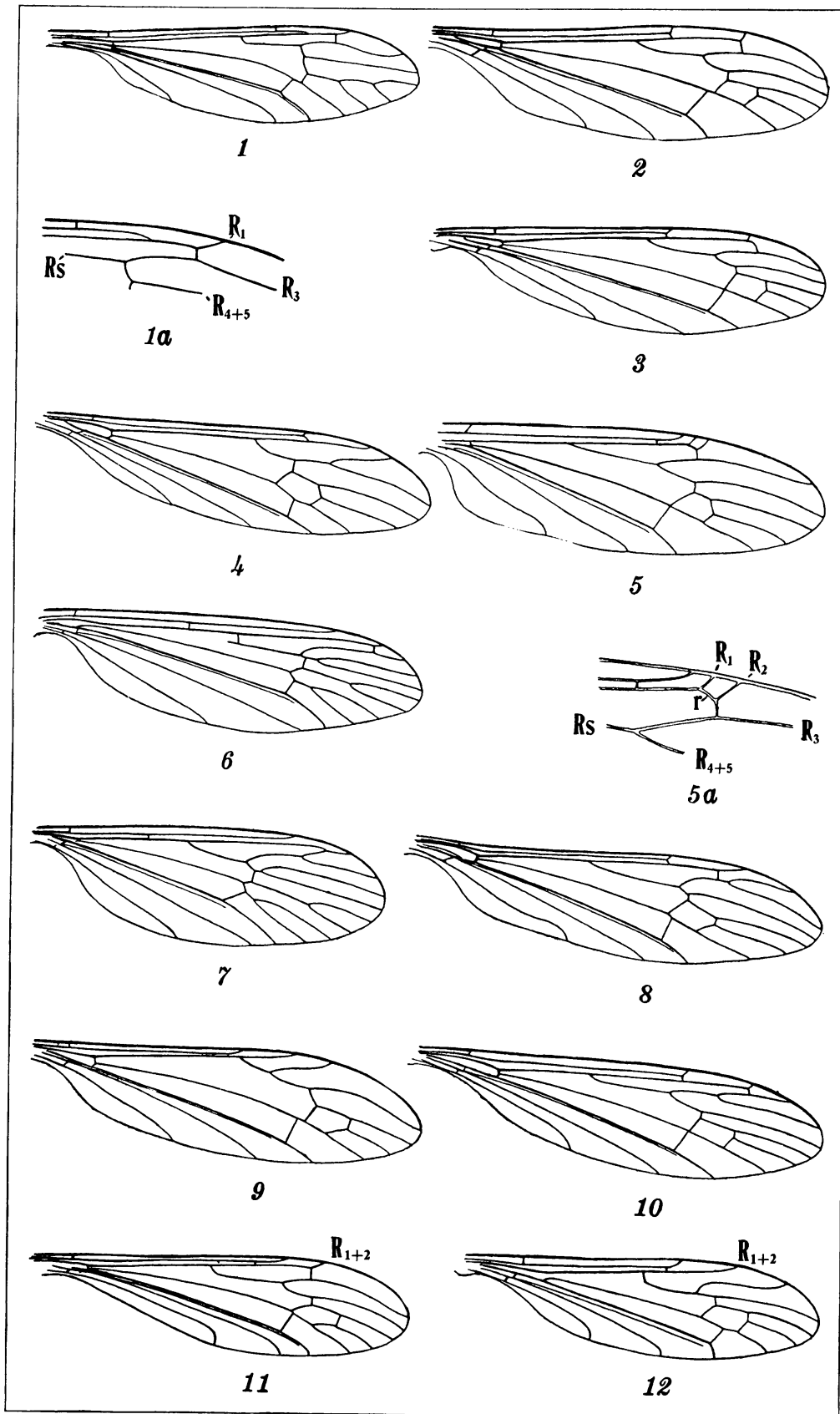


PLATE 1.

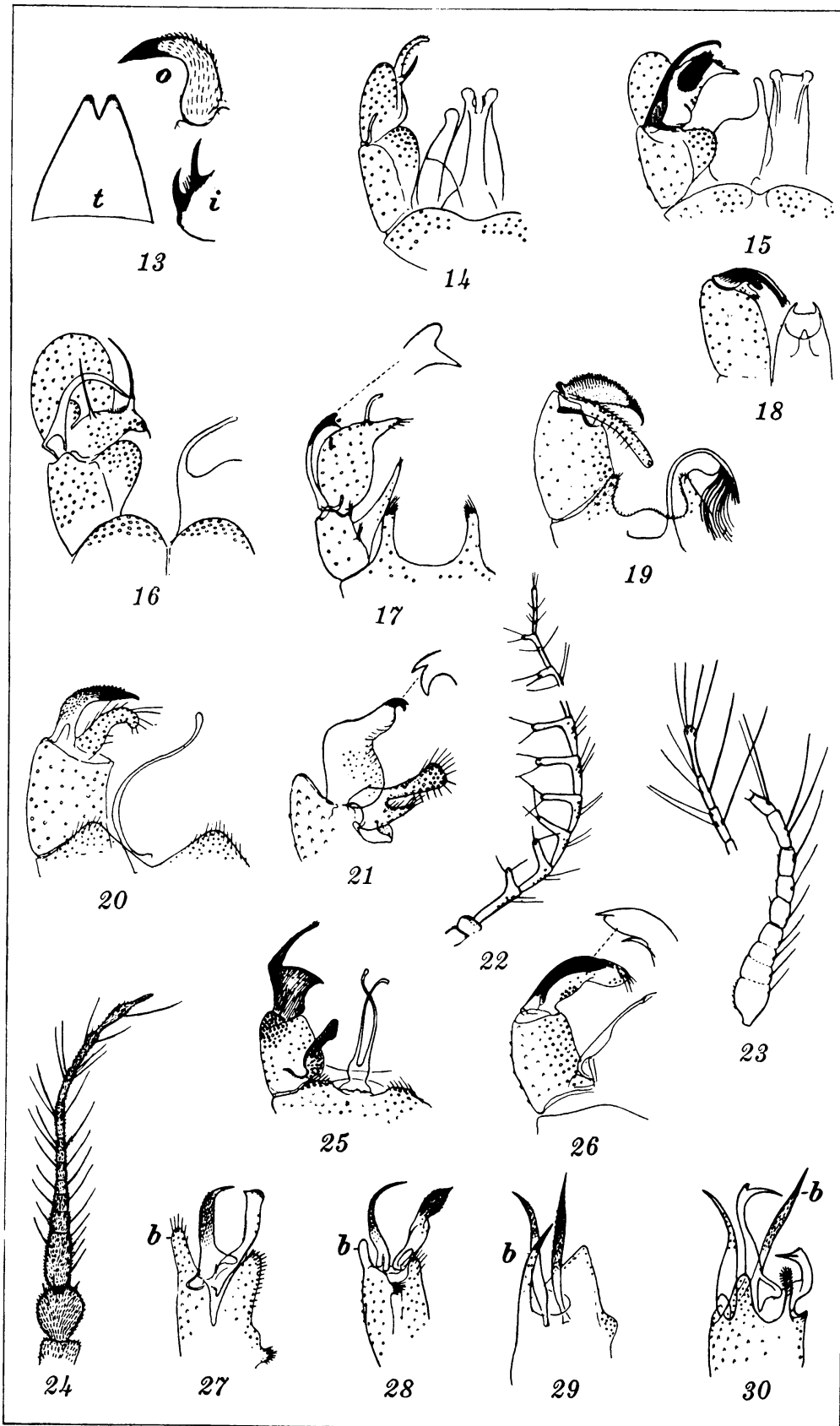


PLATE 2.

ERRATA

Page 55, in the fourth line from the bottom, *for* Chamberlain,
read Chamberlin,

Page 57, in line 20, *for* giving birth *read* the liberation of

Page 57, in footnote 5, *for* (1912) *read* (1913)

Page 58, in the third paragraph, line 2, cancel the comma.

Page 61, insert a center head INSECTA above the center head
ORTHOPTERA

Page 62, in the quotation from Imms, in line 5, *after* soil
insert very much after the manner of the "casts" of earthworms.
In many parts of the tropics there is scarcely a cubic yard of
soil

Page 63, footnote 11, in line 2, *for* 234 *read* 243

Page 70, in line 26, *for* by others. *read* by others *for* *Ochro-*
myia.

Page 70, in line 29, *for* *Ochrimyia*. *read* *Ochromyia*.

Page 72, in the second line from the bottom, *for* *gibolensis*
read *gilolensis*

Page 73, to footnote 29, *add* 210.

Page 75, in the thirteenth line from the bottom, *for* centi-
meters, *read* centimeters;

Page 75, in the third line from the bottom, cancel both commas.

Page 76, in the sixth line of the quotation, cancel the semi-
colon.

Page 76, in the sixth line from the bottom, *for* *chrysogona*
read *chrysozona*

Page 80, in line 19, *for* Notodontidæ *read* Notodontidæ

Page 82, to footnote 37, *add* 325-326.

Page 83, in line 24, *for* *Chalbyion* *read* *Chalybion*

Page 83, in the thirteenth line from the bottom, *for* of Bull.
read of my Bull.

Page 83, in the eleventh line from the bottom, *for* *interudens*
read *intrudens*

Page 86, in the second paragraph, line 2, and in footnote 43,
for 1927 *read* 1928

Page 87, in the second paragraph, line 5, *for* *Cephalomomyia*.
read *Cephalonomyia*.

Page 93, for line 4, *read* of the nests of certain other ants, like those of *Anoplolepis*—

Page 96, to footnote 57, add the date 1923.

Page 97, line 8, delete the first comma.

Page 97, in line 11, *for* pluræ, *read* plura,

Page 97, in line 22, *for* mesopluræ, *read* mesoplura,

Page 98, in line 5, *for* margination *read* emargination

Page 98, in line 17, *for* margins *read* margin

Page 100, in line 16, *for* reticulate; drawn *read* reticulate, drawn

Page 100, in line 17, *for* place; *read* thorn;

Page 105, in the ninth line from the bottom, cancel “and not very loud.”

Page 108, in footnote 65, *for* 187. *read* 185.

Page 108, in footnote 66, *for* 27: 408. *read* 27 (1920) 409.

Page 109, cancel the center heading.

Page 112, in footnote 69, *for* (1922). *read* (1907) 1022.

Page 112, in footnote 70, *for* (September, 1925). *read* (1925) 326.

Page 118, in the description of Plate 7, fig. 1, *for* *celebensis* *read* *celebesensis*