

10, 16, 1924

207

UNDESCRIBED SPECIES OF JAPANESE CRANE-FLIES.*

PART V.*

ENTOMOLOGICAL
BIS
JON K. GELHAU

HONOLULU 17, HAWAII

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The preceding parts under this general title were published in these ANNALS in 1919, 1921, 1923, and 1924. The species described at this time are chiefly from the mountains of Honshiu and Kiushiu, where they were collected by my friends, Messrs. Esaki, H. Hori, Machida, Takeuchi and Yokoyama. A few additional forms were taken in Hokkaido by Messrs. M. Hori and Kuwayama. Still other species from Saghalien, the Loochoo Islands and Taiwan were taken by Messrs Kuwayama, Sakaguchi and Takeuchi, respectively. My sincere thanks are extended to all of the above collectors for their kind co-operation in making known the very extensive Tipuloidean fauna of the Japanese Empire. The types of the new species are preserved in the collection of the writer.

The question has been raised by Professor Cockerell as to whether Taiwan (Formosa) should justly and correctly be included in a paper having a general title such as the present one. A great number of works and papers on Japanese insects have included Taiwan in their scope and the writer can see no vital objection to such a course, either from a faunistic or political viewpoint. I am greatly indebted to my friend, Professor Teiso Esaki, for an expression of his opinion as to what should be considered as being "Japan Proper," and what possessions fall outside this strict application. Professor Esaki has an intimate first-hand knowledge of virtually the entire Empire, having travelled and collected from Saghalien to Taiwan, and his opinions may be taken as authoritative: "I believe that in its strict sense, Japan should be considered as consisting of *Honshiu* (Hondo, the main island of Japan), with Sado, Oki, Awaji and Izu Islands (Oshima, Hachijojima, Miyakejima, etc.); *Shikoku*; *Kiushiu* (with Iki, Tsushima and Osumi Islands), and *Hokkaido* (Yezo) with the Kurile Islands.

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

irregular crossbands; cell *C* with three of these marks, restricting the interspaces to narrow quadrate areas, the marks continued into cell *R*, where they are gray, bordered with brown, ending abruptly just before reaching vein *M*; the fourth or stigmal band includes the stigma and is confluent with a circular, pale-centered ring at the fork of *Rs*, connected outwardly with the fifth or subterminal band; narrow brown seams along the cord and outer end of cell *1st M*₂; wing-apex and very extensive but vague cloudings at the tips of all the longitudinal veins, pale gray; veins dark brown, the wing-base, *C*, *Sc* and *R* yellowish. Venation: *Sc*₁ ending just beyond the origin of *Rs*, *Sc*₂ not evident in the type-specimen; *r* at tip of *R*₁; cell *1st M*₂ elongate-rectangular, a little shorter than *M*₁₊₂ beyond it; basal deflection of *Cu*₁ just before the fork of *M*.

Abdomen dark brown, the subterminal segments passing into black; fleshy dististyle of male hypopygium paler brown.

Habitat: Japan (Kiu-shiu). Holotype, ♂, Mt. Kirishima, on boundary between Osumi and Hiuga, altitude 3,250 feet, October 30, 1923, (T. Esaki).

Dicranomyia pammelas sp. n.

Head and thorax shiny coal-black; fore femora largely black with a subterminal obscure yellow ring; wings whitish subhyaline, the base and costal region conspicuously light yellow, the disk with a heavy brown pattern.

Male. Length, 7 mm.; wing, 7.2 mm.

Rostrum and palpi black. Antennæ with the scapal segments black, the flagellar segments brown, the latter oval, becoming more elongate and darker colored outwardly. Head black, very sparsely pruinose.

Pronotum and mesonotum shiny coal-black, the cephalic margin of the postnotal pleurotergite with a narrow line of silvery microscopic pubescence. Halteres yellow, the apices of the knobs conspicuously dark brown. Legs with the coxæ shiny black, narrowly paler apically; trochanters obscure yellow; fore femora black, the basal fourth obscure yellow, before the apex with a narrow obscure yellow ring that is about one-half as wide as the dark tip; remaining femora obscure yellow, the tips conspicuously blackened; tibiæ and tarsi brownish yellow, the tips narrowly and indistinctly infuscated; tarsi brown, passing into black. Wings whitish subhyaline, the base and costal region conspicuously light yellow; a heavy brown pattern, distributed as follows: A blotch at end of *Sc*, confluent with a larger area at origin of *Rs*; stigma oval and slightly darker brown; a circular spot at fork of *Rs*, barely touching the stigma; cord and outer end of cell *1st M*₂ conspicuously seamed; wing-apex extensively darkened, this including the outer half of cell *2nd R*₁, outer two-thirds of cells *R*₃, *R*₅, and almost all of cells *2nd M*₂ and *M*₃; a conspicuous cloud along vein *Cu* in cell *M* and conspicuous marginal clouds at ends of all the longitudinal veins; anal angle more or less darkened; veins dark brown, yellow in the flavous areas. Venation: *Sc* short, *Sc*₁ ending shortly beyond the origin of *Rs*, *Sc*₂ at its tip; *r* at tip of *R*₁, the latter beyond it very short; *Rs* feebly angulated at base;

The Loochoo (Riukiu) Islands, including Okinawa, and the Bonin Islands (Ogasawarajima) are not included in Japan Proper. Likewise, the new domains of the Japanese Empire, i. e., Formosa (Taiwan), Southern Saghalien (Karafuto) and Corea (Chosen) are not included in Japan Proper."—Esaki.

Dicranomyia Stephens.

Dicranomyia (*Euglochina*) *okinawensis* sp. n.

Male. Length, 8 mm.; wing, 8.8 mm.

Female. Length, about 7 mm.; wing, 7.5 mm.

Generally similar to *D. (E.) fuscibasis* Alexander (India), differing as follows: Size larger. Infuscated proximal ends of basitarsi narrower, broadest on posterior legs where about the basal fifth is darkened. Wings tinged with brown, the oval stigma a little darker brown. Venation: *Sc* short, *Sc*₂ near the tip of *Sc*₁, the distance between the end of the latter and the origin of *Rs* fully three times *Rs*; *Rs* angulated and spurred near midlength; cell *1st M*₂ elongate-rectangular, longer than any of the veins issuing from it; basal deflection of *Cu*₁ just before midlength of cell *1st M*₂.

Habitat: Japan (Loocho Islands). Holotype, ♂, Kunjangan, Okinaw, altitude 500–1,000 feet, May, 1923, (S. Sakaguchi).

Dicranomyia kirishimana sp. n.

General coloration dark brown, the thorax with silvery patches; legs yellow, the femoral tips conspicuously dark brown, the tibial bases and tips narrowly infuscated; wings whitish subhyaline, with a heavy brown crossbanded pattern.

Male. Length, 5 mm.; wing, 6.5 mm.

Rostrum black, the palpi dark brown. Antennal scape brownish black; flagellar segments oval, obscure yellow, the tips weakly infuscated to produce an indistinct bicolorous effect, the terminal segments more uniformly infuscated. Head silvery gray, the vertex with a black longitudinal mark on either side of a subequal median gray stripe, these marks continued to the occiput; genæ duller gray.

Pronotum and mesonotum brownish black with silvery patches, the praescutum with a median stripe of the ground color; scutellum and postnotum silvery pruinose. Pleura silvery gray, with a vague longitudinal brownish black stripe across the mesopleura. Halteres relatively short, pale yellow, the large knobs dark brown. Legs with the coxæ dark brown, vaguely pruinose; trochanters concolorous, the tips paler; femora yellow, the tips conspicuously dark brown; tibiæ yellow, the bases narrowly but conspicuously dark brown, the tips narrowly and less distinctly infuscated; tarsi yellow, the terminal segments passing into brown. Wings whitish subhyaline, the extreme base yellow; a heavy and conspicuous brown and gray pattern that assumes the form of five

R_{4+5} longer than the basal section of R_{2+3} ; cell 1st M_2 relatively small, subrectangular; basal deflection of Cu_1 about one-half its length before the fork of M .

Abdomen black, the caudal margins of the segments narrowly pale; hypopygium black.

Habitat: Japan (Honshiu, Kiushiu). Holotype, ♂, Mt. Minomo, Settsu-no-kuni, June 22, 1922, (T. Esaki). Paratypes, ♂ ♂, Kashii, near Fukuoka, Kiushiu, June 11, 1924, (H. Hori).

Dicranomyia pammelae bears a marked resemblance to *D. takeuchii* Alexander (Japan), differing conspicuously in the wing-pattern, there being no conspicuous brown clouds in the radial field basad of the origin of R_s .

Libnotes Westwood.

Libnotes puella sp. n.

Belongs to the *poeciloptera* group; allied to *L. strigivena* (Walker); size very small (wing, ♀, less than 10 mm.); antennal flagellum brownish black throughout; thoracic pleura narrowly lined with dark brown; femora with narrow and relatively indistinct brown subterminal rings; r at the tip of R_1 .

Female. Length about 9 mm.; wing 9.5 mm.

Rostrum and palpi pale brown. Antennal scape obscure brownish yellow, the flagellar segments brownish black, broadly oval with short pedicels; terminal segments passing into elongate-oval. Head obscure rufous medially, the vertex more infuscated, the orbital region gray; vertex between the eyes reduced to a narrow strip.

Pronotum brown, pale laterally. Mesonotal praescutum obscure yellow with three confluent brown stripes, the broad median stripe irregular, becoming abruptly obliterated, brownish gray, before the suture and more or less constricted near midlength; the narrow lateral stripes touch the median stripe at their anterior mesal ends; lateral margin of the praescutum infuscated; remainder of the mesonotum light gray pruinose, the lateral half of each scutal lobe and the broad lateral margins of the postnotal mediotergite conspicuously infuscated. Pleura light gray pruinose, less so in front, with two narrow dark brown longitudinal stripes, the dorsal one beginning on the cervical sclerites, crossing the propleura and anepisternum onto the pteropleurite; the ventral stripe begins on the fore coxa, crosses the sternopleurite onto the extreme dorsal edge of the meso-coxa and meron. Halteres yellow, the knobs infuscated. Legs with the coxae and trochanters pale brownish testaceous, the coxae marked with brown as described above; femora yellow with a narrow brown subterminal ring about its own length before the yellow tips; tibiae and basitarsi obscure yellow, the tips narrowly infuscated; terminal tarsal segments brownish black. Wings pale yellow, rather sparsely variegated with small brown spots and gray dots and clouds; the brown spots occur on the veins at intervals, as in

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the *poeciloptera* group; the gray clouds and dots occupy all the cells, becoming somewhat larger along the posterior margin of the wings; veins yellow, dark brown in the infuscated areas. Venation: r at tip of R_1 and a little longer than it; R_s about one-half longer than the deflection of R_{4+5} ; m about twice the outer deflection of M_3 , gently arcuated; basal deflection of Cu_1 more than its length beyond the fork of M .

Abdomen obscure brownish yellow, the extreme lateral margins of the segments dark brown, forming a narrow pleural stripe. Ovipositor with the bases of the valves black.

Habitat: Japan (Kiushiu and Loochoo Islands). Holotype, ♀, Mt. Kirishima, on boundary between Osumi and Hiuga, Kiushiu, altitude 3,250 feet, October 30, 1923, (T. Esaki). Paratypes, 2 ♀ ♀, Iriomote, Loochoo Islands, altitude 300–500 feet, Late July, 1923, (S. Sakaguchi).

Molophilus Curtis.

Molophilus (Molophilus) albohalterata sp. n.

General coloration black; antennæ short in both sexes; halteres conspicuously yellowish white; wings strongly tinged with brown, the extreme bases paler.

Male. Length, 3–3.5 mm.; wing, 4–4.5 mm.

Female. Length, 3.6–4.4 mm.; wing, 4.4–4.8 mm.

Rostrum and palpi black. Antennæ short, the basal segments black, the terminal segments passing into dark brown. Head black.

Thorax entirely black. Halteres very conspicuously pale yellowish white. Legs brownish black throughout. Wings strongly tinged with brown, the extreme base pale; distal half of the wing a little paler than the basal half; veins and macrotrichia darker brown. Venation: R_1 deflected cephalad beyond r ; basal deflection of Cu_1 about two-fifths the fusion of M_{3+Cu_1} ; vein 2nd A long and sinuous.

Abdomen black, including the hypopygium. Male hypopygium with the apical style a small, sickle-shaped hook, the points directed dorsad, each with a small erect spine at its base; basal dististyle slender, straight, the slender apex blackened and provided with microscopic setæ, the appendage barely exceeding the apices of the basistyle and not reaching the tip of the long, straight, yellow aedeagus. Apex of each basistyle on the apparent dorsal face produced caudad into a long, stout, digitiform lobe, the apex of each contiguous on the mid-dorsal line. Ovipositor with the valves horn-colored; tergal valves stout, only gently upcurved.

Habitat: Japan (Honshiu). Holotype, ♂, Mt. Takao, Musashi-no-kuni, altitude 1,000–2,000 feet, May 7, 1922, (T. Esaki). Allotopotype, ♀. Paratopotypes, 9 ♂ ♀.

Rhabdomastix Skuse.**Rhabdomastix (Sacandaga) atrata** sp. n.

Coloration brownish black throughout, including the halteres and legs; wings strongly tinged with blackish; tips of R_1 and R_2 remote from one another.

Male. Length about 3.3 mm.; wing, 3.4 mm.

Rostrum and palpi brownish black. Antennæ short, black throughout, the flagellar segments oval. Head brownish black.

Prothorax and mesothorax entirely brownish black. Halteres brownish black, the extreme base of the stem vaguely brightened. Legs dark brown, the tarsi passing into brownish black. Wings with a strong blackish tinge, the stigmal region indistinctly darker; veins brown. Anal angle of wing moderately prominent. Venation: Sc_1 ending about opposite midlength of Rs , Sc_2 about three times its length from the tip of Sc_1 ; R_2 short, remote from the tip of R_1 at the margin, the distance between them along costa being about two and one-half times R_2 alone; inner end of cell $1st\ M_2$ pointed.

Abdomen dark brown, the basal sternites a trifle paler on their anterior portions; hypopygium brownish black.

Habitat: Japan (Honshiu). Holotype, ♂, Emi-mura, Chiba-Ken, July 6, 1923, (T. Yokoyama).

Cladura Osten Sacken.**Cladura decem-notata** sp. n.

General coloration pale yellow; mesonotal praescutum with four black spots; extreme anterior lateral angles of scutal lobes blackened; black spots on anepisternum and sternopleurite; tips of femora and tibiae narrowly darkened; wings pale yellow, $r-m$ faintly seamed with brown.

Female. Length, 6.5 mm.; wing, 8-8.2 mm.

Rostrum and palpi brownish testaceous. Antennæ pale throughout, the flagellar segments oval. Head brownish yellow.

Pronotum light yellow throughout. Mesonotum pale yellow, with two oval to linear intermediate black spots, representing the anterior ends of the usual praescutal stripes; lateral stripes represented by slightly larger black spots; scutum similar, the extreme anterior lateral angles with a triangular black spot; remainder of mesonotum yellowish testaceous. In one paratype, the posterior margin of the postnotal mediotergite with two oval black spots. Pleura yellowish testaceous, with an elongate-triangular black spot on the anepisternum and a smaller and more diffuse brownish black one on the posterior lateral portion of the sternopleurite, the latter sometimes weakly indicated. Halteres pale, the knobs weakly infuscated. Legs with the coxæ and trochanters yellowish testaceous; femora yellow, the tips narrowly infuscated; tibiae yellow, the tips narrowly blackened; basitarsi obscure yellow, soon passing into brown. Wings with a pale yellow tinge, the

base and costal region more saturated yellow; an indistinct brown seam on $r-m$; veins dark brown, C , Sc , R , base of Cu and the veins at the wing-base more yellowish; squamal region of the wing blackened. Venation: Sc_1 extending to beyond the base of R_2 , Sc_2 a short distance before the fork of R_{2+3} ; petiole of cell M_1 from once to twice the length of m ; basal deflection of Cu_1 at or close to the fork of M .

Abdominal tergites obscure yellow, the lateral margins extensively pale brown, the color continued across the caudal margins of the segments as narrow borders; sternites pale yellow, the caudal margins narrowly more orange-yellow. Ovipositor with the long valves reddish horn-color.

Habitat: Japan (Kiushiu). Holotype, ♀, Aburayama, Chikuzen, November 17, 1923, (H. Hori). Paratypes, 2 ♀ ♀, Mt. Kirishima, on boundary between Osumi and Hiuga, altitude 3,250 feet, October 31, 1923, (T. Esaki).

Limnophila Macquart.**Limnophila (Prionolabis) neomunda** sp. n.

Male. Length, 5.5-6 mm.; wing, 6.8-7.8 mm.

Female. Length about 5.5 mm.; wing 6.7 mm.

Closely related to *L. submunda* Alexander, differing as follows: Legs stouter; wings less extensively clouded with brown, there being no distinct blotch at the origin of Rs , no seam along vein of Cu , the mark along the cord much more restricted in extent and less conspicuous, and the wing apex scarcely darkened. Venation: Sc_1 ends about opposite mid-length of R_{2+3} , Sc_1 much shorter than in *submunda*; R_{2+3} subequal to or even a little longer than the basal deflection of Cu_1 ; cell M_1 and its petiole subequal. Hypopygium with the inner dististyle very different in structure; this appendage is relatively small, feebly bifid at apex, the lateral arm very short to subobsolete, with a few yellow setæ, the mesal arm a little longer, its apex with three or four tiny denticles. Outer dististyle with about four teeth in addition to the long apical tooth. Base of aedeagus not reticulate.

Habitat: Japan (Hokkaido). Holotype, ♂, Sapporo, Ishikari-no-kuni, June 1, 1921 (M. Hori). Allotopotype, ♀. Paratopotypes, 2 broken ♂ ♂.

Limnophila (Ephelia) dietziana sp. n.

General coloration light grey, the praescutum variegated with small brown spots and dots; legs light yellow, the femoral tips conspicuously and broadly blackened; wings whitish subhyaline, spotted and dotted with dark brown, all the cells with numerous dots between the larger markings.

Male. Length about 3.6-3.8 mm.; wing, 4.5-5.3 mm.

Rostrum and palpi brownish black. Antennæ with the scape dark brown; flagellum yellow, the base of each segment narrowly infuscated. Head light grey, narrowly dark brown medially.

Pronotum light grey, infuscated medially. Mesonotal praescutum light grey, the usual striped pattern very much broken up into fuscous spots and dots; the median stripe is represented by two parallel or divergent lines before midlength of the sclerite and a single, median, rectangular blotch just before the suture; lateral stripes small, triangular, remote from the suture; between the median and lateral stripes are two small, elongate dashes that are sometimes broken; lateral margins of the praescutum extensively and conspicuously dark brown, including a linear dash anterior to the pseudosutural foveæ; transverse suture with a U-shaped median brown portion, the ends of the U, in cases, with detached dots; scutum grey; each lobe with a small brown triangle; a small caudo-median spot extending onto the scutellum; postnotum gray, extensively infuscated behind. Pleura gray, variegated with dark brown spots. Halteres yellow, the knobs darkened. Legs with the coxæ gray, variegated with brown spots; trochanters light brown; femora yellow, the tips broadly and abruptly blackened, each femur at base on inner face with a linear black dash; tibiae yellow, the tips narrowly but conspicuously blackened; tarsi yellow, the segments narrowly tipped with dark brown, the terminal segments uniformly infuscated. Wings whitish subhyaline, conspicuously spotted and dotted with dark brown, distributed as follows: A series of five costal blotches, the second at origin of R_s ; third at tip of Sc , fourth at tip of R_1 , the last connected along the cord to form a V; fifth area at tip of R_2 ; wing-apex darkened; smaller spots at the supernumerary cross-vein in cell M ; along the cord and outer end of cell $1st M_2$; a series along vein Cu and one just before the tip of vein $2nd A$; all of the remaining cells of the wing are densely dotted with brown; veins dark brown, paler in the ground areas. Venation: R_s square at origin; basal deflection of Cu_1 more than one-half its length beyond the fork of M .

Abdomen dark brown, including the hypopygium.

Habitat: Japan (Honshiu). Holotype, ♂, Mt. Hakone, Sagami-no-kuni, altitude 2,300 feet, July 13, 1923, (T. Esaki). Paratype, Sex? Tamagawa, Musashi-no-kuni, September 7, 1922, (J. Machida).

Additional specimens of this very distinct fly are in the collection of Dr. William G. Dietz, in whose honor the species is named.

Limnophila kirishimensis sp. n.

Allied to *L. ochracea* Meigen; general coloration uniformly pale brown, pleura with an incomplete longitudinal pale brown stripe; wings brownish yellow, the stigma darker brown; basal deflection of Cu_1 far out beneath the outer end of cell $1st M_2$.

Male. Length, 6.5 mm.; wing, 7.8 mm.

Female. Length, 7.5–8 mm.; wing, 8.2–8.8 mm.

Rostrum pale brown, the palpi dark brown. Antennæ black, the second scapal segment brown; base of first flagellar segment obscure

brownish yellow; antennæ of male of moderate length, if bent backward extending about to the base of the abdomen, the flagellar segments elongate-oval to fusiform; antennæ of female short, extending about to wing-root. Head gray.

Mesonotum rather uniformly pale brown with a more or less distinct median paler stripe on the praescutum. Pleura obscure buffy with a narrow brown longitudinal stripe extending from the cervical sclerites across the dorsal pleurites to beneath the wing-root. Halteres long and slender, pale brown, the base of the stem narrowly yellow. Legs with the coxæ and trochanters yellow; femora light brown, the tips scarcely darkened; tibiae and tarsi somewhat darker brown. Wings with a brownish yellow tinge, the elongate oval stigma darker brown; veins brown, more yellowish in the costal region. Venation: Sc_1 ending about opposite one-third the length of R_{2+3} , Sc_2 at its extreme tip; R_s angulated and weakly spurred at origin; R_{2+3} longer than the basal section of R_2 and fully twice the basal deflection of Cu_1 , gently arcuated; r at tip of R_1 ; distal section of R_2 angularly sinuate; inner ends of cells R_3 , R_5 and $1st M_2$ in approximate alignment; cell $1st M_2$ pentagonally rectangular; cell M_1 very deep, its petiole about one-half longer than m ; basal deflection of Cu_1 far out at the distal end of cell $1st M_2$, the fusion of M and Cu being subequal to or less than m ; anterior arculus broken.

Abdominal tergites brown, the caudal margins of the segments vaguely paler; sternites obscure yellow, the bases of the segments a little darkened.

Habitat: Japan (Kiushiu). Holotype, ♂, Mt. Kirishima, on boundary between Osumi and Hiuga, altitude 3,250 feet, October 30, 1923, (T. Esaki). Allotopotype, ♀, October 31, 1923. Paratopotypes, 6 ♂ ♀, October 30–31, 1923.

It seems that this species, as well as *toxoneura* Osten Sacken (Eastern North America), *badia* Doane (Western North America), *ochracea* (Meigen), of Europe, and *illustris* Alexander (Taiwan) should all be referred to *Pseudolimnophila* Alexander or in its near vicinity.

Limnophila inaequalis sp. n.

Related to *L. nemoralis* (Meigen); general coloration dark brown; wings with r about five times its length from the tip of R_1 ; R_{2+3} and basal section of R_{4+5} subequal; abdomen dark brown; gonapophyses of male hypopygium produced apically into long slender points.

Male. Length about 5 mm.; wing 6 mm.

Rostrum, palpi and antennæ uniformly dark brown, the second scapal segment globular. Head dark brown.

Pronotum brown, darker medially. Mesonotum dark reddish brown, very sparsely pruinose, the humeral region of the praescutum a little brighter, the scutal lobes, scutellum and postnotum more heavily pruinose. Pleura plumbeous. Halteres pale. Legs with the coxæ infuscated; trochanters obscure testaceous, the margins dark brown;

remainder of legs brownish yellow, the tarsi becoming darker. Wings with a yellowish tinge, the stigma pale; veins brownish yellow; *r* near proximal end of stigma. Venation: *Rs* angulated at base; *R*₂₊₃ very short, about equal to the basal deflection of *R*₄₊₅; *r* far from the tip of *R*₁, approximately five times its length, and about twice its length beyond the fork of *R*₂₊₃; cell *M*₁ small, about two-fifths its petiole; cell *1st M*₂ rectangular, the basal deflection of *Cu*₁ near two-fifths its length.

Abdomen dark brown, the hypopygium paler. Gonapophyses very different from the condition obtaining in *nemoralis* and allies, these being broad at base, a little enlarged beyond midlength, the tips produced into long, slender points, the apophyses decussate or nearly so.

Habitat: Japan (Taiwan). Holotype, ♂, Musha, altitude about 3,500 feet, May 19, 1922, (K. Takeuchi).

Limnophila kuwayamai sp. n.

Allied to *subpoetica* Alexander; general coloration ferruginous; hypopygium black; legs brownish black; wings faintly infuscated, stigma darker brown.

Male. Length, 8 mm.; wing, 8.5 mm.

Rostrum obscure yellowish brown, the mouthparts and palpi dark brown. Antennæ elongate, if bent backward, extending about to one-third the length of the abdomen; scapal segments pale brown, the flagellum black with an erect white pubescence. Head dark brown.

Pronotum dark brown. Mesonotum shiny ferruginous, more yellowish posteriorly. Pleura yellowish testaceous. Halteres broken. Legs with the coxæ and trochanters concolorous with the pleura; remainder of legs brownish black, the femoral bases rather narrowly paler. Wings faintly tinged with brown; stigma darker brown; wing-apex, a small cloud at origin of *Rs*, the cord and outer end of cell *1st M*₂ faintly darkened. Venation: *Rs* angulated and spurred at origin; *r* at tip of *R*₁; petiole of cell *M*₁ a little longer than *R*₂₊₃; basal deflection of *Cu*₁ just before midlength of cell *1st M*₂.

Abdomen brownish yellow, the tergites somewhat darker laterally; hypopygium and penultimate segment black.

Habitat: Japan (Hokkaido). Holotype, ♂, Sapporo, Ishikari-no-kuni, End of July, 1921 (S. Kuwayama); collector's number 89.

This interesting crane-fly is named in honor of the collector, Professor Satoru Kuwayama.

Tricyphona Zetterstedt.

Tricyphona gaudens sp. n.

General coloration light gray; antennæ 13-segmented, the flagellum obscure fulvous; wings pale brown, the costal region brown with a subcostal darker brown longitudinal stripe, uniting with a conspicuous dark brown seam along the cord; center of the disk in cells *R*₁, *M*, and

ker. Wings yellow; *r* near *e*; *R*₂₊₃ very from the tip *e* its length petiole; cell *1st M*₂ rectangular, the basal deflection of *Cu*₁ near two-fifths its length. Gonapophyses very allies, these the tips produced into long, slender points, the apophyses decussate or nearly so.

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flagellum with a sub-spacious *M*, and

bases of cells *R*₅ and *1st M*₂ yellow; *Sc*₂ beyond the origin of *Rs*; *r-m* long, sinuous, oblique in position, connecting with *Rs* before the tip; cell *1st M*₂ closed.

Male. Length, 19 mm.; wing, 18 mm.

Rostrum and palpi black. Antennæ short, 13-segmented, the terminal four segments narrowed and crowded; scape black; flagellum obscure fulvous, the basal seven segments stout, short-cylindrical to subglobular; terminal four segments infuscated. Head dark gray, the anterior region of vertex variegated with lighter gray, the orbits narrowly of the same color.

Pronotum dusted with gray, the scutellum brown medially, obscure yellow laterally. Mesonotum light gray, the praescutum with four blue-gray stripes, the intermediate pair separated only by a capillary vitta of the ground-color, the interspaces with golden setæ; scutum light gray, the lobes variegated with blue-gray; scutellum and postnotum light gray. Pleura dark, light gray pruinose. Halteres yellow, the knobs infuscated, especially apically. Legs with the coxæ yellow, very sparsely pruinose; trochanters yellow; femora yellow, the tips conspicuously but rather narrowly dark brown; tibiae and tarsi dark brown. Wings pale brown, the center of the disk clear yellow; cells *C* and *Sc* brown, bordered caudally by a dark brown longitudinal stripe extending from the wing-root, along cell *R*, following the sector and *R*₂₊₃ to the wing-tip; a broad and conspicuous darker brown seam along the cord; stigma oval, brown; cell *R*₂ and all but the subbasal region of *R*₃ darkened; veins brownish yellow, darker in the infuscated areas. Venation: *Sc*₂ lying about twice its length beyond the origin of *Rs*, the latter very long, straight, the origin strongly arcuated; *R*₂ uniting with *R*₁ a little less than its own length from the tip; *r-m* long, sinuous, connecting *Rs* immediately before its tip with *M*₁₊₂; petiole of cell *R*₄ about equal to the basal deflection of *Cu*₁; cell *1st M*₂ closed, *m* a little more than twice the petiole of cell *M*₁; basal deflection of *Cu*₁ beyond the fork of *M*, the distance a little less than the basal section of *M*₁₊₂, the fusion of *M*₃ and *Cu*₁, a little longer than the basal deflection of *Cu*₁ alone.

Abdomen with the basal segment dark brown; segments two and three brown, variegated with obscure yellow, the lateral margins of the subterminal segments broadly light gray; hypopygium brownish black.

Habitat: Japan (Honshiu). Holotype, ♂, Kyoto, May 9, 1923, (K. Takeuchi).

Tricyphona gaudens approaches the type of *Pedicia*, especially in the wing-pattern, although the brown seam along vein *Cu*, characteristic of all known species of *Pedicia*, is lacking in the present form.

Tanyptera Latreille.

Tanyptera angustistylus sp. n.

Size very small (wing, ♂, under 12 mm.); wings with a brownish yellow tinge; tip of vein *R*₂ atrophied; dististyle of male hypopygium long and narrow.

Male. Length 11.5–12 mm.; wing 9.8–11 mm.

Frontal prolongation of head and palpi black. Antennal scape black, the flagellar segments and branches dark brown. Head black.

Pronotum black, obscure yellow dorso-medially. Thorax shiny black, the dorso-pleural membrane light sulphur-yellow. Halteres yellow, the knobs sulphur-yellow. Legs with the coxæ and trochanters black; femora brownish yellow, brighter basally, the tips conspicuously blackened; tibiae yellowish brown, the base narrowly, the tip more broadly infuscated; tarsi dark brown; tibial spurs black, densely provided with appressed yellow setæ, especially the posterior pair. Wings with a brownish yellow tinge, the base and costal region brighter yellow; stigma somewhat subcircular, brown; veins dark brown, those in the flavous areas and behind vein *Cu* more yellowish. Venation: Tip of vein R_2 atrophied for from one-half to three-fourths its length back from margin; cell $1st\ M_2$ small; *m-cu* elongate.

Abdomen black, the sublateral portions of the tergites conspicuously obscure brownish yellow, broader and more distinct on the antepenultimate segment; caudal margins of the segments narrowly obscure brownish yellow, the sternites more broadly so. Male hypopygium large, black; dististyle relatively long and narrow, projecting, narrowed gradually to the blackened tips.

Habitat: Japan (Hokkaido). Holotype, ♂, Mt. Moiwa, Ishikari-no-kuni, June 15, 1923, (S. Kuwayama). Paratopotypes, 3 ♂♂.

Cnemoncosis Enderlein.

Cnemoncosis uniplagiata sp. n.

Female. Length 21 mm.; wing 15 mm.

Generally similar to the genotype, *C. nohiræ* (Matsumura) (*hilgen-dorfi* Enderlein), differing as follows:

Size much smaller, as shown by the measurements. Dorsum of the frontal prolongation of the head infuscated. Antennæ with the flagellum less conspicuously serrate, the basal flagellar segments rufous. Pronotum broadly yellow medially. Mesonotum with the usual praescutal stripes black, confluent, but leaving parts of the yellow ground-color as humeral triangles and narrow posterior interspaces before the suture; each scutal lobe with a conspicuous yellow spot on posterior margin; postnotal mediotergite with a broad oblique yellow stripe on either side, divergent and narrowed behind. Fore and middle femora with the tips broadly and conspicuously blackened; posterior legs nearly as in *nohiræ*, but the subbasal swelling of the tibia only feebly indicated. Wings subhyaline, the base, costal region and stigma bright yellow; a large, conspicuous brown blotch before the tip, occupying parts of cells $2nd\ R_1$, R_2 , R_3 , R_5 , M_1 , $1st\ M_2$ and $2nd\ M_2$; the medial band of the genotype is represented only by a barely visible clouding in cell *R*.

Habitat: Japan (Hokkaido). Holotype, ♀, Maruyama, near Sapporo, Ishikari-no-kuni, July, 1923, (S. Kuwayama). Paratopotype, a teneral ♀ in poor condition.

Tipula Linnaeus.

Tipula macrotrichiata sp. n.

General coloration pale yellowish brown; antennæ of male elongate, the flagellar segments bicolorous; wings yellow, the stigma dark brown; conspicuous brown seams on certain of the veins, most evident on the basal deflection of Cu_1 ; cell $1st\ M_2$ small, irregularly quadrangular; conspicuous macrotrichiae in cells R_3 to $2nd\ M_2$.

Male. Length about 10 mm.; wing, 12 mm.

Female. Length about 11.5 mm.; wing, 12.2 mm.

Frontal prolongation of head yellow, including the nasus, the ventral surface of the prolongation more infuscated; palpi dark brown. Antennæ elongate, especially in the male, if bent backward extending to opposite midlength of the abdomen; antennæ yellow, the basal swelling of the segments brownish black, the terminal segments becoming more uniformly infuscated; in the female, the antennæ do not extend beyond the wing-root. Head pale brown, indistinctly darker medially; anterior part of front whitish.

Mesonotal praescutum yellowish brown with four very faintly indicated darker brown stripes, the intermediate pair strongly narrowed behind; remainder of mesonotum pale brown, the postnotum in the male more pruinose; pleurotergite with a large, oval, pale area immediately above the base of each halter. Pleura obscure yellow, sparsely pruinose, with two longitudinal blackish stripes, the more dorsal across the ventral margin of the anepisternum, the ventral one across the sternopleurite; ventral margin of meron likewise faintly darkened. Halteres pale brownish yellow, the base of the stem and the knobs clearer yellow. Legs with the coxæ yellow, the fore coxæ weakly infuscated; trochanters yellow; femora obscure yellowish brown, the tips indistinctly darkened; tibiae and tarsi passing into dark brown. Wings light yellow, the base and costal region still clearer; stigma oval, dark brown; conspicuous brown clouds along *Cu* and its branches; wing-tip infuscated, more evidently in cells R_2 and R_3 ; longitudinal veins and anterior cord seamed with darker; a brown cloud at tip of vein $2nd\ A$; veins pale, darker in the infuscated areas. Obliterative areas before the cord. Conspicuous macrotrichiae in cells R_3 , R_5 , M_1 and $2nd\ M_2$, in the female being more extensive in the radial cells. Venation: *Rs* moderately long, gently arcuated; R_2 preserved throughout its length; cell $1st\ M_2$ small, irregularly quadrangular, *m* being very short; basal section of M_{1+2} and basal section of M_3 subequal, pale; basal deflection of Cu_1 at the fork of *M*, the fusion rather extensive, about equal to *r*; basal deflection of Cu_1 long, sinuous.

Abdomen obscure yellow, the lateral margins of the tergites with a conspicuous dark brown longitudinal stripe, the sutures of the tergites less distinctly infuscated; eighth tergite blackened in male; basal sternites yellow, the intermediate segments more infuscated.

Habitat: Japan (Honshiu). Holotype, ♂, Kyoto, May 12, 1923, (K. Takeuchi). Allotopotype, ♀.

In its general appearance this fly suggests *T. nipponensis* Alexander and allies, but differs conspicuously in the macrotrichia of the wings. The obliteration of the basal section of M_3 would produce a venation very like *Dolichopeza*.

***Tipula kiushiensis* sp. n.**

General coloration gray, the praescutum with four narrow dark brown stripes; wings grayish, with a marmorate subhyaline pattern; vein R_3 strongly arcuated toward R_{4+5} ; ninth tergite of male hypopygium with a V-shaped notch, the arms of the notch projecting as short, divergent spines.

Male. Length, 13 mm.; wing, 15 mm.

Female. Length, 16 mm.; wing, 18 mm.

Frontal prolongation of head dark gray, the nasus narrowly tipped with reddish; palpi brownish black. Antennae with the scapal segments yellow, the flagellum black; antennae of moderate length, in the male, if bent backward, extending nearly to the base of the halteres. In the female the antennae are short and only the second scapal segment is yellow. Head yellowish gray, the vertex somewhat darker.

Pronotum high, grayish yellow. Mesonotal praescutum light yellowish gray with four narrow dark brown stripes, the anterior ends of the intermediate stripes obliterated; pseudosutural foveae reduced to a circular black spot; scutum gray, each lobe with two conspicuous brown spots; scutellum and postnotum brownish gray. Pleura yellowish gray, the sternopleura darker. Halteres yellow, the knobs dark brown with the tips indistinctly paler. Legs with the coxae yellowish gray; trochanters reddish yellow; femora obscure brownish yellow, the tips rather broadly blackened; tibiae brown, the tips narrowly darker; tarsi dark brown. Wings grayish, with a marmorate subhyaline pattern much as in the *marmorata* group; cell *Sc* entirely dark brown; stigma oval, dark brown; a small seam at origin of R_s ; anterior cord and outer deflection of Cu_1 indistinctly seamed with brown; a brown seam behind vein Cu and its branches, widest marginally at the tip of Cu_2 ; the subhyaline areas lie before and beyond the stigma, before and beyond midlength of cells R and M , near midlength of cell $1st A$, and marginal areas in the ends of both anal cells; veins dark brown, costa more yellowish. Venation: R_s a little longer than R_{2+3} ; vein R_3 bent strongly toward R_{4+5} , which is bent slightly cephalad, cell R_3 being narrowed at this point as in *Ctenacrosclis*; cell $1st M_2$ large, the cephalic margin arcuated; petiole of cell M_1 about equal to m ; $m-cu$ preserved.

Abdomen yellow, the lateral margins of the tergites vaguely darker; a subterminal dark brown ring, including segments six to eight, tergite nine and the basal half of sternite nine. Male hypopygium large, the caudal third of the ninth tergite deflected, the margin with a conspicuous V-shaped notch, the lateral angles running out into short black divergent spines. Eighth sternite unarmed, projecting slightly caudad. Ovipositor with long, slender, smooth valves.

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Habitat: Japan (Kiushiu). Holotype, ♂, Mt. Kirishima, on boundary between Osumi and Hiuga, altitude 3,250 feet, October 30, 1923, (T. Esaki). Allotopotype, ♀.

***Tipula nigrocostata* sp. n.**

General coloration light gray with darker gray stripes; antennae elongate, feebly bicolorous; halteres elongate; wings subhyaline, cells C and Sc brownish black; wings sparsely variegated with darker; male hypopygium with the tergite having a blackened disk, the margin trifid, the median lobe rectangular, the lateral lobes acute.

Male. Length, 13-14 mm.; wing, 15-17 mm.

Frontal prolongation of head grayish, the nasus long and slender, black; palpi brownish black. Antennae elongate, being approximately one-half the length of the body; basal segment brownish black; second segment brown; first segment of flagellum brown with an obscure yellow ring near midlength; remaining segments with the basal enlargement black, the remainder varying from brownish yellow to dark brown to produce a more or less distinct bicolorous effect. Head yellowish gray, the vertex with an ill-defined brown median line.

Pronotum brownish gray. Mesonotal praescutum light gray with three dark gray to blackish gray stripes, the median stripe cuneiform with the anterior part more suffused with light gray and further divided by a capillary dark brown vitta; scutum gray, each lobe with two blackish gray areas, the posterior mesal one larger; scutellum and postnotum more brownish gray, with a continuous capillary dark brown median vitta. Pleura pale whitish gray, the ventral two-thirds of the anepisternum and the ventral half of the sternopleurite darker gray to produce an indistinct longitudinally striped appearance; dorso-pleural membrane pale. Halteres elongate, dark brown, the extreme base of the stem yellow. Legs with the coxae pale gray pruinose, especially basally; trochanters yellow, the apex on the mesal face with a conspicuous brown spot; femora brown, the bases paler; remainder of legs black; tarsi long and slender. Wings subhyaline, cells C and Sc brownish black; prearcular region pale; stigma elongate-oval, dark brown, completely filling cells Sc_1 and $2nd R_1$; anterior cord seamed with brown; cell M with a dusky area beyond midlength and another at the outer end, with an irregular area of the ground-color between; anterior cord and adjacent part of R_s seamed with brown; wing-apex in the radial cells extensively infuscated; veins dark brown, pale in the subhyaline areas. Venation: R_s elongate; terminal section of R_2 preserved, but without macrotrichia; petiole of cell M_1 a little longer than m ; $m-cu$ punctiform.

Abdomen with the basal tergites yellowish, passing through yellowish brown to brown on the outer segments, with a median dark brown stripe that is narrowly interrupted at the caudal margins of the segments; sternites obscure brownish yellow, the terminal segments darkened. Male hypopygium small, the tergite of very remarkable form, the disk and apex heavily blackened and chitinized, the margin jutting caudad into a conspicuous rectangular median lobe, the lateral angles of this

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chitinized disk acute; the anterior or cephalic margin of the disk with an acute suberect spine on either side of the median line. Basistyles complete, triangularly produced caudad into conspicuous lobes.

Habitat: Japan (Kiushiu). Holotype, ♂, Mt. Kirishima, on boundary between Osumi and Hiuga, altitude 3,250 feet, October 30, 1923, (T. Esaki). Paratopotypes, 3 ♂♂. Paratype, ♂, Aburayama, Chikuzen, November 17, 1923, (H. Hori).

Nephrotoma Meigen.

Nephrotoma hokkaidensis sp. n.

Size large, (wing, 15 mm. or more); general coloration yellow; head, scutellum, postnotum and pleura largely gray; wings subhyaline; stigma dark brown; a narrow brown seam along the cord; wing-apex infuscated.

Male. Length, 13 mm.; wing, 15-16 mm.

Female. Length, 20-22 mm.; wing, 15.5-17.5 mm.

Frontal prolongation of the head brownish black; in the male the sides, at apex, yellow; palpi dark brown. Antennæ of moderate length, shorter in female, dark brown, the second segment and apex of the first beneath obscure yellow; flagellar segments moderately incised beneath. Head gray, the anterior part of vertex and the front clear yellow to orange-yellow, the front silvery white laterally; a dark spot on either side at the narrowest point of the vertex, adjoining the eye; genæ, adjoining the eyes, restrictedly pale.

Pronotum whitish, darker laterally. Mesonotal praescutum shiny yellow with three conspicuous shiny black stripes that are distinctly separated; lateral stripes straight; scutum yellow, each lobe with a conspicuous black mark; scutellum dark gray, yellowish laterally; postnotum with the mediotergite broadly gray medially, the lateral margins dull yellow; pleurotergite with a very conspicuous white or yellowish white elongate mark between the bases of the wing and the halteres. Pleura gray, the dorso-pleural region broadly sulphur-yellow; pleurites more or less variegated with pale, including a more or less distinct longitudinal stripe across the mesepisternum. Halteres pale brownish yellow, the knobs clearer yellow. Legs with the coxæ gray, sometimes pale apically; trochanters yellow; femora and tibiæ light brown, passing into darker brown apically; tarsi black. Wings subhyaline; cells *C* and *Sc* more yellowish; stigma dark brown, sending a brown seam along the cord to the posterior margin; wing-apex in cells *R*₃, *R*₅ and *M*₁ narrowly but conspicuously darkened; veins dark brown. Venation: *R*_s longer than *R*₂₊₃, arcuated; cell *M*₁ sessile; *m-cu* near the fork of *M*.

Abdomen reddish yellow; first tergite gray; tergites two to six each with a glabrous basal band; the median area of the tergites with the exception of the basal band, dark brown, this area variable in extent; surface of tergites with small yellow setæ; sternites yellow; terminal segments and hypopygium black; outer dististyle pale. Male hypopygium

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Kirishima, 3,250 feet, ♂. Paratype, (H. Hori).

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with the eighth sternite unarmed. In the female, the brown median stripe of the abdomen is more or less continuous and there is, in addition, a very narrow lateral tergal stripe.

Habitat: Japan (Hokkaido). Holotype, ♂, Yoichi, Shiribeshi-no-kuni, June 26, 1921, (S. Kuwayama). Allotopotype, ♀. Paratopotypes, 2 ♂♀. Paratypes, ♂♀, in copula, Sapporo, Ishikari-no-kuni, June 15, 1921 (M. Hori); 2 ♀♀, Sapporo, end of July, 1921, (S. Kuwayama); ♂♀, Mt. Moiwa, Ishikari-no-kuni, June 15, 1923, (S. Kuwayama).

Some of the paratypes are in the collection of the Hokkaido Agricultural Experiment Station.

Nephrotoma saghaliensis sp. n.

General coloration yellow, the thoracic markings black; wings faintly yellow, the base and costal region brighter; stigma dark brown; conspicuous macrotrichiae in the apical cells; abdomen yellow, the terminal segments black; tergites narrowly trilineate with brownish black; a conspicuous capitate appendage jutting from beneath the eighth sternite of the male hypopygium.

Male. Length, 10 mm.; wing, 11.8 mm.

Frontal prolongation of head yellow, the dorsum, including the nasus, dark brown. Antennæ relatively short; scape obscure yellow; basal flagellar segment light brown; remaining flagellar segments brownish black, the incisures of the basal segments a little paler. Head orange-yellow; occipital brand conspicuous.

Pronotum light yellow, dark brown laterally. Mesonotal praescutum shiny yellow, with three conspicuous black stripes; laterad of the cephalic end of the lateral stripe a paler brown spot that gives to the stripe the appearance of being outcurved; scutum yellow, each lobe very extensively marked with black; remainder of mesonotum yellow, the postnotum darker posteriorly. Pleura light brown, variegated with yellow; a conspicuous china-white area on the lateral sclerites of the postnotum between the bases of the wings and halteres. Halteres pale brown, the base of the stem and the knobs yellow. Legs with the coxæ obscure yellow, their bases weakly infuscated; trochanters obscure yellow; femora brown, the tips conspicuously brownish black, very extensive on the fore legs, where about the outer two-fifths is included; tibiæ light brown, the tips rather narrowly but conspicuously blackened; tarsi black. Wings with a faint yellowish tinge, the base and costal region brighter yellow; anal cells grayish yellow; stigma oval, dark brown; oblitative areas before and beyond the stigma and at the fork of *M*; a brown seam on the deflection of *R*₄₊₅ and *r-m*. Conspicuous macrotrichiae in the distal ends of cells *R*₃ to 2nd *M*₂. Venation: Cell *M*₁ barely sessile.

Abdomen yellow, the tergites narrowly trilineate with brownish black, the median stripe narrowly interrupted at the posterior margin of

each segment, the lateral stripes more continuous; segments six and seven black, yellowish sublaterally; segments eight and nine black, including the hypopygium. Male hypopygium with a conspicuous slender rod emerging from beneath sternite eight, as in the *cornicina* group, this rod black, the apex capitate, reddish, covered with an appressed pubescence.

Habitat: Japan (Saghalien, Honshiu). Holotype, ♂, Toyohara, Saghalien, August 29, 1921, (S. Kuwayama). Paratype, ♂, Yumoto, Shimotsuke-no-kuni, Honshiu, altitude 4,830 feet, July 23, 1923, (T. Esaki).

Nephrotoma saghalienensis is related to *N. cornicina* (Linnaeus) and *N. aculeata* (Loew) in the conspicuous appendage of the eighth sternite of the male hypopygium. The macrotrichia in the distal cells of the wing in the present species are lacking in *cornicina* and *aculeata*.