

# UNDESCRIBED SPECIES OF JAPANESE CRANE FLIES

## PART IV.\*

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The preceding parts under this general title were published in these ANNALS in 1919, 1921 and 1923. The species described at this time were included in extensive collections from Taiwan, taken by Messrs. Esaki and Takeuchi; from the island of Okinawa in the Loochoos, collected by Mr. Sakaguchi; and from various parts of Honshiu, collected by Messrs. Esaki, Machida and Takahashi. I would express my sincere thanks to all the above entomologists for the privilege of retaining this very valuable collection.

In these ANNALS in 1920, the writer presented a Bibliography of the literature concerning the Tipuloidean fauna of Taiwan (Formosa). A number of additional papers have recently appeared and these are listed herewith:

- Alexander, C. P. New or Little-Known Crane-Flies from Formosa (Tipulidæ, Diptera); Ann. Ent. Soc. Amer., 13:249-270, 1920.
- Alexander, C. P. Four Undescribed Species of Limnobia from the Oriental Region (Diptera, Tipulidæ); Insec. Inscit. Menst., 10:75-80, 1922.
- Alexander, C. P. Undescribed Species of Japanese Crane-Flies (Tipulidæ, Diptera). Part III; Ann. Ent. Soc. Amer., 16:57-76, 1923.
- Alexander, C. P. Undescribed Crane-Flies from Formosa and Luzon (Tipulidæ, Diptera); Philippine Journ. Sci., 22:467-481, 1923.
- Edwards, F. W. The Old-World Species of Eriocera in the British Museum Collection (Diptera, Tipulidæ); Ann. Mag. Nat. Hist., (9), 8:67-99, pl. 10, figs. 1-12, 1921.
- Edwards, F. W. New and Little-Known Tipulidæ, Chiefly from Formosa. Part II; Ann. Mag. Nat. Hist., (9), 8:99-115, pl. 10, figs. 13-19, 1921.
- Enderlein, Gunther. Dipterologische Studien XVII; Zool. Anzeig., 52:219-232, 1921.

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

## Geranomyia Haliday.

*Geranomyia* (*Geranomyia*) *sakaguchii*, sp. n.

Size large (wing over 9 mm.); pleura heavily striped longitudinally with brownish black; wings tinged with gray, the costal region more yellowish, the disk spotted;  $Sc_1$  ending shortly beyond the origin of  $R_s$ .

*Male*. Length (excluding rostrum) 7.2 mm.; wing 9.4 mm.; rostrum alone 1.6 mm. *Female*. Length (excluding rostrum) 8.6 mm.; wing 10 mm.; rostrum alone 2 mm.

Rostrum relatively short, black, the apex obscure yellow; palpi black. Antennæ black throughout, the flagellar segments slightly produced in the male, oval in the female. Head black, sparsely pruinose.

Pronotum dark brown. Mesonotal præscutum obscure yellow, with three brown stripes, the extreme lateral margin of the sclerite a little darkened; scutal lobes darkened; scutellum brownish testaceous; postnotum with the mediotergite brownish testaceous, the lateral margin blackened. Propleura yellowish. Mesopleura silvery testaceous, with two conspicuous brownish black stripes, the more dorsal one broader, beginning on the fore coxæ, traversing the dorsal pleurites, crossing the postnotal pleurotergite onto the extreme margin of the mediotergite; the ventral stripe is narrow, traversing the mesosternum, passing above the coxæ and beneath the halteres to the abdomen. Halteres pale yellow. Legs with the coxæ greenish testaceous, the base of the fore coxæ dark brown; trochanters greenish testaceous; femora obscure yellow with a narrow and relatively ill-defined brown ring immediately before the tips; tibiæ obscure yellow, the tips faintly darkened; terminal tarsal segments infuscated. Wings tinged with gray, the costal region yellowish; rather small but conspicuous brown spots at arculus; at the supernumerary crossvein in cell  $Sc$ ; at tip of  $Sc$  and origin of  $R_s$ ; at fork of  $R_s$ ; at stigma; along the cord and outer end of cell  $1st M_2$ ; extreme margin of wing faintly darkened; veins pale brown;  $C$ ,  $Sc$ ,  $R$  and  $R_s$  yellow; costa beyond the origin of  $R_s$  strongly incrassated; costal fringe short; wing-apex obtuse. Venation:  $Sc_1$  ending a short distance beyond the origin of  $R_s$ ,  $Sc_2$  longer than vein  $M_3$  beyond it; basal deflection of  $Cu_1$  beyond the fork of  $M$ , longer than  $Cu_2$ .

Abdomen dark brown, the sternites and hypopygium paler. Valves of the ovipositor straight.

*Habitat*: Japan (Saikaido). Holotype, ♂, Shuri, Okinawa, Loochoo Islands, altitude 300 feet, March 11, 1923 (S. Sakaguchi). Allotopotype, ♀.

This large and showy *Geranomyia* is named in honor of the collector to whom I am indebted for many Tipulidæ from the Loochoo Islands.

*Limonia* Meigen.*Limonia divaricata*, sp. n.

General coloration reddish brown, the median area of the præscutum broadly dark brown; wings faintly tinged with brown, the stigma oval,  $Sc$  long,  $Sc_2$  at the tip of  $Sc_1$ ; veins beyond the cord elongate; male hypopygium with the tip of the ædeagus produced into divaricate blades. *Male*. Length, 5 mm.; wing, 6.5 mm. *Female*. Length, 5 mm.; wing, 6.4 mm.

Rostrum light brown, the palpi darker brown. Antennæ dark brown, the second scapal segment a little paler, the flagellar segments short-oval. Head light gray, more silvery gray anteriorly.

Pronotum dark brown. Mesonotal præscutum reddish brown with a broad dark brown median stripe that becomes obliterated before the suture, the extreme lateral margin behind the pseudosutural foveæ faintly darkened; scutum brownish yellow, each lobe largely covered by a conspicuous dark brown area; scutellum brownish testaceous, faintly pruinose; postnotum pale brown. Pleura obscure yellow, the episternum and mesosternum infuscated. Halteres obscure yellow, the knobs weakly infuscated. Legs with the coxæ and trochanters yellow, the fore coxæ weakly infuscated; femora obscure brownish yellow, slightly darker towards the tip; tibiæ and basitarsi pale brown, the terminal tarsal segments darker. Wings faintly tinged with brown, the stigma oval, slightly darker brown; veins dark brown. Venation:  $Sc$  long,  $Sc_1$  ending beyond the fork of  $R_s$ ,  $Sc_2$  at the extreme tip of  $Sc_1$  and longer than it;  $R_s$  shorter than cell  $1st M_2$ , arcuated; veins beyond the cord elongate, *Libnotes*-like;  $r$  at tip of  $R_1$ ; inner ends of cells  $R_3$ ,  $R_5$  and  $1st M_2$  in approximate alignment;  $m$  and outer deflection of  $M_3$  subequal; basal deflection of  $Cu_1$  near midlength of the elongate cell  $1st M_2$ ; vein  $M_{1+2}$  beyond  $m$  one-half longer than cell  $1st M_2$ .

Abdominal tergites brown, the sternites still darker, the caudal margins of the segments very faintly paler; hypopygium brown. Male hypopygium with the ventral dististyles relatively small, the mesal face produced into a long, curved, chitinized beak that is unarmed; dorsal dististyle sickle-shaped. Gonapophyses with the mesal apical angle produced into a blackened, gently curved lobe. Aedeagus with each outer lateral angle produced into a flattened, divaricate blade, with two small, acute, parallel points between the blades.

*Habitat*: Japan (Honshiu). Holotype, ♂, Tokyo, June 10, 1923 (R. Takahashi). Allotopotype, ♀. Paratopotype, ♂.

*Limonia imbellis*, sp. n.

General coloration light yellow, the pronotum and a cephalic triangle on the præscutum dark brown; antennal scape black, the flagellum yellow; legs black, the extreme bases of the femora and tibiæ paler; wings subhyaline, sparsely seamed with darker; abdomen obscure yellow.

*Male.* Length, 9 mm.; wing, 9 mm. *Female.* Length, 8 mm.; wing, 8.3 mm.

Rostrum brown, the palpi black. Antennæ with the scapal segments black, the flagellum conspicuously yellow throughout its length, the flagellar segments oval. Head dark gray, the vertex at its narrowest point passing into silvery white.

Pronotum yellow, with a conspicuous brown median stripe. Mesonotum yellow, the extreme cephalic margin of the præscutum with a wedge-shaped dark brown mark. Pleura yellow. Halteres obscure yellow, the apices of the knobs passing into brown. Legs with the coxæ and trochanters yellowish testaceous; femora black, only the narrow bases obscure brownish yellow; remainder of the legs black, the bases of the tibiæ a little paler. Wings subhyaline, the base and costal region yellowish, cells *C* and *Sc* passing into brown before their tips; cell *Sc*<sub>1</sub> entirely infuscated; stigma small, circular in outline, dark brown; indistinct brown seams at origin of *Rs*, along cord and outer end of cell *1st M*<sub>2</sub>, along vein *Cu* and as a narrow margin around the wing; veins brownish black, those in the pale areas yellow. Venation: *Sc* long, *Sc*<sub>1</sub> extending to opposite one-fourth the basal section of *R*<sub>2+3</sub>, *Sc*<sub>2</sub> some distance from the tip of *Sc*<sub>1</sub>, a little beyond midlength of the distance between the origin of *Rs* and the tip of *Sc*<sub>1</sub>; *Rs* long, gently arcuated; cell *1st M*<sub>2</sub> shorter than *M*<sub>3</sub> but longer than *Cu*<sub>1</sub> beyond it; basal deflection of *Cu*<sub>1</sub> shortly beyond the fork of *M*.

Abdomen obscure yellow, including the male hypopygium, the latter with fleshy ventral dististyles. Ovipositor with the tergal valves slender, gently upcurved.

*Habitat:* Japan (Taiwan). Holotype, ♂, Urai, altitude about 1,500 feet, April 20, 1922 (K. Takeuchi). Allotopotype, ♀.

#### *Helius* St. Fargeau.

##### *Helius subfasciatus*, sp. n.

General coloration dark brown, pruinose; rostrum a little longer than the remainder of the head; femora and tibiæ brownish yellow; wings tinged with yellow, with seams of brown along *Cu* and the anterior cord.

*Female.* Length about 8 mm.; wing, 8.8–9.2 mm.

Rostrum relatively long and slender, about one-third longer than the head, dark brown, including the palpi. Antennæ with the scape black, the flagellum dark brown; flagellar segments cylindrical, passing into oval. Head dark brown, sparsely pruinose.

Pronotum brown, the scutellum obscure yellowish brown. Mesonotum dark brown, gray pruinose, with a median brown vitta, the humeral regions and lateral ends of the suture a little paler; remainder of mesonotum dark brown, sparsely pruinose. Pleura dark brownish black, sparsely pruinose. Halteres obscure brownish yellow. Legs with the coxæ brown, the fore and middle coxæ darker; femora obscure

brownish yellow, the tips only indistinctly darker; tibiæ and tarsi obscure yellow, the terminal segments of the latter passing into brown. Wings tinged with yellow, the base and costal region more saturated; stigma oval, brown; a narrow brown seam along the anterior cord to the fork of *M* and a conspicuous seam along vein *Cu*, chiefly in cell *M*<sub>1</sub>; posterior cord and outer end of cell *1st M*<sub>2</sub> less distinctly seamed; veins brown, the base and costal region more yellowish. Venation: *Sc*<sub>1</sub> ending opposite the fork of *Rs*, *Sc*<sub>2</sub> at its tip; deflection of *R*<sub>4+5</sub> short, less than *r-m*; basal deflection of *Cu*<sub>1</sub> more than one-half its length beyond the fork of *M*.

Abdomen dark brown, the long, straight valves of the ovipositor horn-colored, the sternal valves blackened at base.

*Habitat:* Japan (Taiwan). Holotype, ♀, Musha, altitude about 3500 feet, May 19, 1922 (K. Takeuchi). Paratopotypes, 2 ♀ ♀.

#### *Antocha* Osten Sacken.

##### *Antocha (Antocha) dentifera*, sp. n.

General coloration light gray, the mesonotal præscutum with three rather indistinct brown stripes; wings tinged with gray; vein *Sc* short, the basal deflection of *Cu*<sub>1</sub> immediately before the fork of *M*; outer dististyle of male hypopygium with an acute chitinized spine on the lateral face immediately before midlength.

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

Rostrum grayish brown; palpi dark brown. Antennæ light brown. Head brownish gray, clearer gray along the orbits.

Mesonotal præscutum pale obscure gray with three rather indistinct brown stripes; remainder of mesonotum light gray. Pleura gray. Halteres pale, the knobs brown. Legs long and slender, covered with appressed setæ; coxæ pale, very sparsely pruinose; trochanters pale yellow; remainder of the legs dark brown. Wings tinged with gray, the base a little more whitened; veins pale brown, delicate; stigma pale brown. Venation: *Sc* short, as in *A. brevinervis* Alexander; basal deflection of *Cu*<sub>1</sub> immediately before the fork of *M*.

Abdomen pale brown, the basal sternites a little paler. Male hypopygium with the basistyles moderately stout, their base on the mesal face setiferous but not produced into a tubercle; outer dististyle with a conspicuous lateral tooth or spine on the outer edge immediately before midlength; apex of outer dististyle obliquely truncated to weakly notched; inner dististyle shorter and stouter than in *A. brevinervis*. Gonapophyses longer and more slender, gently sinuous, their tips feebly divergent.

*Habitat:* Japan (Honshiu). Holotype, ♂, Mt. Takao, Musashi-no-kuni, altitude 1,000–2,000 feet, May 7, 1922 (T. Esaki). Paratopotype, ♂, April 13, 1923 (T. Esaki).

## Orimarga Osten Sacken.

**Orimarga formosicola**, sp. n.

General coloration light gray; wings tinged with pale brown;  $r$  about its length from the tip of  $R_1$ , the latter extending to opposite midlength of  $R_{2+3}$ ; basal section of  $R_{2+3}$  longer than the basal deflection of  $R_{4+5}$ ;  $R_{2+3}$  with about 28 macrotrichia.

*Female.* Length about 6 mm.; wing, 5.4 mm.

Rostrum and palpi dark brown. Antennae dark brown throughout, the flagellar segments oval. Head light gray.

Thorax elongate, as in the genus, light gray, the median area of the praescutum and the scutal lobes darker gray. Pleura with the dorsal sclerites brownish gray, the central sclerites paler brown. Halteres obscure yellow, the knobs scarcely darkened. Legs pale brown, the terminal tarsal segments a little darker. Wings with a pale brown tinge, the veins darker brown. Venation:  $Sc$  moderately elongate,  $Sc_1$  ending near midlength of  $Rs$ ,  $Sc_2$  at its extreme tip;  $Rs$  strongly angulated at origin;  $r$  about its own length beyond the tip of  $R_1$ , the terminal section of the latter with three macrotrichia;  $R_1$  extending to opposite midlength of  $R_{2+3}$ ; basal section of  $R_{2+3}$  from one-third to one-half longer than the basal deflection of  $R_{4+5}$ ;  $R_{2+3}$  with about 28 macrotrichia; basal deflection of  $Cu_1$  about opposite one-third the length of  $Rs$ .

Abdomen elongate, brown, the valves of the ovipositor slender and elongate.

*Habitat:* Japan (Taiwan). Holotype, ♀, Kanshirei, altitude about 1,000 feet, September 10, 1921 (T. Esaki).

**Orimarga taiwanensis**, sp. n.

*Female.* Length about 4.8 mm.; wing, 4.5 mm.

Generally similar to *O. formosicola* sp. n., differing as follows:

Mesonotum, legs and wings darker. Venation very distinct:  $Sc$  long, ending beyond midlength of  $Rs$ ,  $Sc_2$  scarcely indicated;  $Rs$  long, arcuated at origin; basal section of  $R_{2+3}$  very short, only one-half the basal deflection of  $R_{4+5}$  and not much longer than  $r$  which is placed a little more than its length from the tip of  $R_1$ ;  $R_1$  ending at about one-fifth the length of  $R_{2+3}$ , the latter with about 18 macrotrichia; basal deflection of  $R_{4+5}$  strongly arcuated at origin; basal deflection of  $Cu_1$  near one-third the length of  $Rs$ . In the left wing of the type, the extreme base of  $M_3$  is atrophied, leaving the tip suspended as in certain Blepharoceridae. Abdomen shorter, the valves of the ovipositor short and stout.

*Habitat:* Japan (Taiwan). Holotype, ♀, Urai, altitude about 1,500 feet, April 20, 1922 (K. Takeuchi).

## Ormosia Rondani.

**Ormosia arisanensis**, sp. n.

General coloration dark brown; antennal flagellum bicolorous; femora yellow, ringed with brown; wings pale brown, variegated with darker brown and hyaline.

*Male.* Length 4 mm.; wing 6.1 mm.

Rostrum and palpi dark brown. Antennae of moderate length, the scapal segments dark, the flagellar segments bicolorous, dark brown, with the extreme apex of each segment yellow; flagellar segments cylindrical to elongate-oval. Head dark gray.

Mesonotum gray with three brown stripes; scutal lobes gray with brown centers; scutellum and postnotum dark. Pleura dark gray. Halteres pale yellow. Legs with the coxae gray; trochanters obscure yellow; femora yellow, each with a brown postbasal and a nearly terminal ring, the broad yellow annulus thus enclosed occupying nearly one-half the segment; on the posterior femora the basal dark ring is indistinct; tibiae and tarsi obscure yellow, the terminal segments of the latter weakly infuscated. Wings with a pale brown tinge, sparsely variegated with narrow brown seams along the veins and extensive, nearly hyaline areas in certain of the cells; the seams include vein  $Sc_2$ , the cord,  $r$  and the fork of  $M_{1+2}$ ; stigma large, paler brown; the nearly hyaline areas include the outer ends of cells 1st  $R_1$ ,  $R$ ,  $M$ , and the bases of cells 1st  $M_2$ , 2nd  $M_2$  and  $Cu_1$ ; a conspicuous droplet beyond the stigma in cell 2nd  $R_1$ ; indistinct brown dots at the tips of the veins where these attain the margin; veins pale yellowish brown, darker in the infuscated areas. Venation:  $Sc_1$  extending to shortly beyond  $r$ ,  $Sc_2$  opposite mid-length of the straight  $Rs$ ;  $r$  connecting  $R_{2+3}$  some distance before the fork; fork of  $M_{1+2}$  symmetrical; vein 2nd A ending opposite one-third the length of  $Rs$ .

Abdomen dark brown, including the hypopygium, which is rather conspicuously clothed with yellow setae.

*Habitat:* Japan (Taiwan). Holotype, ♂, Arisan, altitude about 7,500 feet, May 9, 1922 (K. Takeuchi).

*O. arisanensis* is closely allied to the smaller *O. pulchra* (Brunetti) of India, differing in the details of coloration and venation. It is very different from the only other described indigenous *Ormosia*, *O. formosana* Edwards.

**Ormosia aculeata**, sp. n.

General coloration gray, the praescutum with four narrow brown stripes; legs black, the femoral bases conspicuously obscure yellow; wings whitish subhyaline, the stigma and seams along the veins brown; cell 1st  $M_2$  open by the atrophy of the outer deflection of  $M_3$ ; anal veins convergent; male hypopygium with each basistyle terminating in a long, acute spine.

*Male.* Length 4.8 mm.; wing 6.2–6.4 mm. *Female.* Length 6.8 mm.; wing 7.5 mm.

Rostrum and palpi black. Antennæ short, the scape brown, the flagellum black; flagellar segments oval, provided with a dense white pubescence. Head brownish gray.

Pronotum brownish gray. Mesonotum light gray, the praescutum with four light brown stripes, the tuberculate pits jet-black, lying between the intermediate stripes; scutal lobes with faintly darkened centers. Pleura light gray. Halteres light yellow. Legs with the coxæ light gray; trochanters obscure brownish yellow; femora black, the bases broadly obscure yellow, narrowest on the fore legs, broadest on the posterior femora where only the distal fourth is blackened; tibiae and tarsi black. Wings whitish subhyaline, cells *C* and *Sc* faintly infused; stigma elongate, dark brown; certain of the longitudinal veins, the tip of *R*<sub>2</sub> and the cord seamed with brown, most conspicuous along *Cu* and the basal deflection of *Cu*<sub>1</sub>; wing-tip and marginal spots at the veins restrictedly brown. Venation: *Sc*<sub>1</sub> ending just beyond *r*, *Sc*<sub>2</sub> shortly beyond mid-length of *Rs*; *r* on *R*<sub>2</sub> immediately beyond its origin; veins *R*<sub>2</sub> and *R*<sub>3</sub> deflected strongly cephalad at tips; cell 1st *M*<sub>2</sub> open by the atrophy of the outer deflection of *M*<sub>3</sub>; *m* transverse and spurred at its union with the distal section of *M*<sub>3</sub>; basal deflection of *Cu*<sub>1</sub> shortly before the fork of *M*; vein 2nd *A* strongly bent, the anal veins convergent.

Abdomen dark gray with light yellow setæ. Male hypopygium with the true ninth tergite ligulate; basistyles stout, the tips narrowed and produced into an acute spine; dististyles on mesal face of basistyle, the larger foot-shaped, the toe directed mesad, near midlength of this appendage is borne a conspicuous black spine that bears numerous short branches; this style is connected basally with clear membrane with the inner dististyle which is more slender, strongly curved, terminating in an acute spine directed caudad. Gonapophyses blackened, especially apically, with small lateral teeth beyond midlength. Aedeagus strongly curved at apex. Ovipositor with the elongate valves horn-colored.

*Habitat:* Japan (Honshiu). Holotype, ♂, Mt. Takao, Musashi-no-kuni, altitude 1,000–2,000 feet, April 13, 1923 (T. Esaki). Allotopotype, ♀. Paratopotype, ♂.

#### *Erioptera* Meigen.

##### *Erioptera* (*Bæoura*) *aliena*, sp. n.

General coloration dark brown, gray pruinose, the scutellum and ovipositor obscure orange; wings subhyaline, the stigma faintly indicated; *Sc* long, *R*<sub>2+3</sub> short, cell 1st *M*<sub>2</sub> open by the atrophy of *m*; anal veins strongly divergent.

*Female.* Length about 4.4 mm.; wing 5.5 mm.

Rostrum reddish brown, the palpi brownish black. Antennæ dark brown, the scapal segments tumid. Head black, pruinose.

Pronotum black, the scutellum obscure yellow. Mesonotum black, gray pruinose, the restricted humeral region of the praescutum, a small outer posterior corner of each scutal lobe and the scutellum obscure orange. Pleura gray pruinose, the dorso-pleural membrane obscure buffy. Halteres infuscated, the base of the stem a trifle paler. Legs with the coxæ black, pruinose; trochanters pale brown; remainder of the legs brown, becoming darker towards the tip of the organ. Wings subhyaline, the stigma faintly indicated as a cloud near *r*; veins dark brown. Venation: *Sc* long, *Sc*<sub>1</sub> ending opposite the fork of *R*<sub>2+3</sub>; *Rs* long, straight; *R*<sub>2+3</sub> about equal to the arcuated basal section of *R*<sub>2</sub>; cell 1st *M*<sub>2</sub> open by the atrophy of *m*; basal deflection of *Cu*<sub>1</sub> about half its length beyond the fork of *M*; anal veins strongly divergent.

Abdomen dark brownish black, pruinose, the short, fleshy valves of the ovipositor obscure orange.

*Habitat:* Japan (Taiwan). Holotype, ♀, Urai, altitude about 1,500 feet, April 20, 1922 (K. Takeuchi).

There is no doubt but that this interesting fly is very closely allied to a group of South African *Erioptera* of which *E. nigrolatera* Alexander, may be taken as typical. The short, fleshy valves of the ovipositor are very different from the condition found in normal *Erioptera* and suggest the condition found in the Tanyderidæ, the *Cylindrotominæ* and other groups. This group of *Erioptera* should have subgeneric ranking and the name *Bæoura* is proposed, with *nigrolatera* as type of the subgenus. The characters of the group are much as in *Erioptera* with the exception of the peculiar ovipositor.

##### *Erioptera* (*Erioptera*) *subsessilis*, sp. n.

General coloration pale brownish ochreous, unmarked; legs brownish yellow; wings subhyaline, the pale brown veins with conspicuous brown macrotrichia; cell *R*<sub>2</sub> subsessile, rectangular at base, at the angle with a long spur that is directed basad; anal veins convergent.

*Male.* Length about 2.8 mm.; wing, 3.3 mm.

Rostrum and palpi dark brown. Antennæ short, the scapal segments brownish black, the flagellum brownish testaceous, the oval flagellar segments with long verticils. Head infuscated, paler behind.

Mesonotum pale brownish ochreous, without distinct markings. Pleura more testaceous. Halteres pale, the knobs darkened. Legs brownish yellow, the terminal tarsal segments a little darkened. Wings subhyaline, the veins pale brown with long, conspicuous brown macrotrichia. Venation: Cell *R*<sub>2</sub> almost sessile, the basal section perpendicular or nearly so and then bent at a right angle, here sending a long spur basad; the elements of the cord in approximate alignment; petiole of cell *M*<sub>3</sub> at least two-thirds the cell; anal veins convergent.

Abdomen pale brown. Male hypopygium with the basistyles produced apically into a stout obtuse lobe and a more slender, digitiform lobe, both clothed with long setæ; the dististyles are complex in structure, both appearing as flattened blades; one a flattened triangular blade, the margin heavily blackened, the outer angle produced into a slightly curved slender arm that is again blackened at tip; the second style, which may be connected basally with the one already described, appears as a smaller complex flattened blade, the angles blackened. The gonapophyses are rather remarkable in appearance, each appearing as a stout, curved, blackened hook, on the basal half bearing a high crest whose margin is distinctly serrulate, the apex of the hook a powerful, feebly curved spine; at the base, this appendage bears a longer and more slender, gently curved arm that is a little blackened at the apex. Aedeagus small, fleshy.

*Habitat:* Japan (Taiwan). Holotype, ♂, Kanshirei, altitude about 1,000 feet, September 10, 1921 (T. Esaki).

#### Gnophomyia Osten Sacken.

##### Gnophomyia nycteris, sp. n.

General coloration black; antennæ moderately elongate; knobs of halteres yellow; femora yellow, the tips broadly dark brown; wings faintly tinged with brown, the extreme base yellowish; veins beyond cell 1st  $M_2$  elongate.

*Female.* Length about 5 mm.; wing, 6.3 mm.

Rostrum and palpi black. Antennæ black, rather elongate, if bent backward extending to a short distance beyond the base of the abdomen. Head black.

Mesonotum and pleura black, the dorso-pleural membrane a little paler. Halteres pale, the knobs obscure yellow. Legs with the coxæ dark brown; trochanters obscure yellow; femora yellow, the tips broadly and conspicuously dark brown, more extensive on the fore femora; tibiæ light brown, the tips narrowly darker; tarsi dark brown. Wings faintly tinged with brown, the extreme base yellowish; veins dark brown. Venation:  $Sc_1$  ending opposite the fork of  $R_{2+3}$ ,  $Sc_2$  about opposite the fork of  $R_s$ , the latter nearly straight and about in alignment with  $R_{4+5}$  whose deflection is lacking or approximately so;  $r-m$  long; cell 1st  $M_2$  very narrow at its proximal end;  $M_{1+2}$  beyond cell 1st  $M_2$  more than twice this cell; basal deflection of  $Cu_1$  at about two-fifths the length of the cell.

Abdomen brownish black, the valves of the ovipositor short, horn-colored.

*Habitat:* Japan (Honshiu). Holotype, ♀, Mt. Minomo, Settsu-no-kuni, October 11, 1922 (T. Esaki).

##### Gnophomyia confluenta, sp. n.

General coloration black, sparsely pruinose; legs and halteres black; wings with a faint brownish tinge;  $Sc_1$  long,  $r$  lacking, cell 1st  $M_2$  open by the atrophy of the outer deflection of  $M_3$ .

*Male.* Length about 5.5 mm.; wing, 7-7.2 mm.

Rostrum and palpi black. Antennæ moderately elongate, if bent backward not reaching quite to the base of the halteres, black throughout; flagellar segments elongate-oval. Head dull black, sparsely pruinose.

Pronotum dark brown, the lateral lobes of the scutellum obscure reddish. Mesonotum and pleura black, gray pruinose. Halteres black, only the base of the stem indistinctly pale. Legs black, moderately hairy. Wings with a faint brownish tinge, the elongate, ill-delimited stigma darker brown; veins dark brown. Venation:  $Sc_1$  ending just before the fork of  $R_s$ ,  $Sc_2$  removed to some distance from the tip, lying just beyond mid-distance between the origin of  $R_s$  and the tip of  $Sc_1$ ;  $r$  lacking; deflection of  $R_{4+5}$  distinct, more than one-half  $r-m$ ; cell 2nd  $M_2$  very deep, approximately four times its petiole; cell 1st  $M_2$  open by the atrophy of the outer deflection of  $M_3$ ; basal deflection of  $Cu_1$  at the fork of  $M$ .

Abdomen, including the hypopygium, black.

The paratype is generally similar to the type but the legs are somewhat paler and the antennæ appear somewhat shorter.

*Habitat:* Japan (Taiwan). Holotype, ♂, Horisha, altitude about 1,500 feet, May 5, 1922 (K. Takeuchi). Paratype, ♂, Urai, altitude about 1,500 feet, April 20, 1922 (K. Takeuchi).

#### Rhabdomastix Skuse.

##### Rhabdomastix (Sacandaga) japonica, sp. n.

Head obscure yellow, dark brown medially; general coloration obscure yellow, the præscutum with three indistinct darker stripes; pleura indistinctly striped longitudinally with darker; halteres light yellow; wings faintly tinged with yellowish brown.

*Female.* Length, 6.5 mm.; wing, 6.8 mm.

Rostrum and palpi dark brown. Antennæ brownish black throughout. Head obscure yellow, the center of the vertex and the occiput conspicuously dark brown.

Mesonotal præscutum obscure yellow with three indistinct grayish brown stripes; scutal lobes gray; scutellum pale; postnotum with the mediotergite pale brown, with a large, yellow, subbasal area at the sides. Pleura obscure yellow, indistinctly striped longitudinally with dark brown, the dorsal stripe ill-defined and broken, the ventral or sternal stripe very distinct. Halteres very light yellow throughout. Legs with the coxæ and trochanters obscure yellowish brown; remainder of the legs brown, the terminal tarsal segments darker brown. Wings with a faint yellowish brown tinge, the base and costal region clearer

yellow; stigma very ill-defined, pale brown; veins brown. Venation:  $Sc$  long,  $Sc_1$  ending beyond three-fourths the length of  $Rs$ ,  $Sc_2$  removed from the tip of  $Sc_1$ , the latter alone about one and one-half times the length of  $r-m$ ;  $R_2$  equal to or less than its own length from the tip of  $R_1$  at the wing-margin;  $m$  lying more distad than the outer deflection of  $M_3$ . Macrotrichia almost as in *R. (S.) schistacea* (Schummel).

Abdomen brown, the segments narrowly and indistinctly obscure yellow at their caudal margins. Ovipositor with the valves dark horn color.

*Habitat:* Japan (Honshiu). Holotype, ♀, Tokyo, May 24, 1922 (T. Esaki).

#### *Pseudolimmophila* Alexander.

##### *Pseudolimmophila marcida*, sp. n.

General coloration brown, the praescutum brighter anteriorly and laterally; antennae brown throughout; wings strongly tinged with brown; basal deflection of  $Cu_1$  beyond midlength of cell 1st  $M_2$ .

*Male.* Length, 6.3 mm.; wing, 8.1 mm.

Rostrum and palpi brown. Antennae brown throughout, the verticils relatively short. Head brown, the vertex broad.

Mesonotum brown, the praescutum rich reddish brown in front and laterally. Pleura light brown with a longitudinal darker brown stripe extending from the cervical sclerites to the halteres. Halteres dark brown. Legs yellowish brown. Wings with a strong brownish tinge, the stigma scarcely darker; veins dark brown. Venation:  $Sc_1$  ending opposite the fork of  $Rs$ ,  $Sc_2$  at its tip;  $Rs$  strongly arcuated at origin;  $r$  less than its length from the tip of  $R_1$  and before midlength of  $R_2$ ; petiole of cell  $M_1$  a trifle shorter than  $R_{2+3}$ ;  $m$  shorter than the outer deflection of  $M_3$ ; basal deflection of  $Cu_1$  at three-fifths the length of cell 1st  $M_2$ ; anterior arculus broken.

Abdominal tergites brown, the terminal segments passing into black, the basal sternites obscure yellow, ringed basally with brown.

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

#### *Tricyphona* Zetterstedt.

##### *Tricyphona optabilis*, sp. n.

General coloration gray, the mesonotal praescutum with three velvety black stripes; legs black, the femoral bases broadly yellow; wings with cell  $R_3$  sessile, cell  $R_4$  short-petiolate, cell 1st  $M_2$  closed, cell  $M_1$  sessile; gonapophyses of male hypopygium bifid at apices.

*Male.* Length about 8 mm.; wing 9.6 mm.

Rostrum and palpi black. Antennae black, the flagellar segments short-cylindrical; antennae of moderate length. Head dark gray.

Pronotum dark gray. Mesonotal praescutum gray with three very conspicuous velvety black stripes, the median stripe distinctly bifid caudally, not attaining the suture; scutum gray, each lobe with two triangular velvety black spots, the more anterior being a continuation of the lateral praescutal stripes; scutellum and postnotum velvety black, possibly pruinose in fresh specimens. Pleura dark gray. Halteres with the base yellow, the remainder broken. Legs with the coxae dark gray, all but the posterior pair passing into yellow at tips; trochanters yellow; femora brownish black, the bases broadly and conspicuously yellow, narrowest on the fore legs, broadest on the posterior legs where approximately the basal half is included; remainder of the legs black. Wings with a faint brown tinge, the base yellowish; stigma pale brown; inconspicuous pale brown seams at origin of  $Rs$ , along the cord and behind vein  $Cu$ ; veins dark brown,  $Sc$  pale brown, the prearcular veins yellow. Venation:  $Sc_2$  a short distance basad of the origin of  $Rs$ , this distance about equal to  $R_3$  alone;  $Rs$  square and long-spurred at origin; cell  $R_3$  sessile, the outer deflection of  $R_2$  subperpendicular and less than its length from the tip of the fused  $R_1$  plus  $R_2$ ; petiole of cell  $R_4$  short, a little less than  $r-m$ , the latter connecting with  $R_{4+5}$  just beyond its origin; cell 1st  $M_2$  closed,  $m$  connecting  $M_3$  with the fork of  $M_{1+2}$ , cell  $M_1$  thus being sessile; basal deflection of  $Cu_1$  about one-third its length beyond the fork of  $M$ ; fusion of  $M_3$  and  $Cu_1$  a little less than  $r-m$ .

Abdomen dark gray, the sternites a little paler basally. Male hypopygium with the basal dististyle slender, gently arcuate, not noticeably dilated distally; numerous powerful setae at apex and extending basad to about midlength of the appendage, basad of which point the setae are very delicate and few in number; at its base, this appendage is united with a pale lobe of nearly equal length, this provided with rather numerous long setae. Apex of basistyle blackened and densely set with microscopic spinulae. Gonapophyses strongly arcuated, with a basal tubercle on the mesal edge, the apex of each apophyse split into two teeth.

*Habitat:* Japan (Honshiu). Holotype, ♂, Otaki, Chichibu, Saitama-Ken, April 23, 1922 (J. Machida).

##### *Tricyphona arisana*, sp. n.

General coloration dark gray, the praescutum with three brown stripes; coxae and pleura dark gray; wings nearly hyaline, the stigma scarcely indicated; cell 1st  $M_2$  closed; abdomen dark brownish gray throughout.

*Female.* Length about 5.5 mm.; wing 8.5 mm.

Rostrum, antennal scape and palpi black. Head dark gray. Mesonotal praescutum light gray with three brown stripes, the median stripe very broad, darker than the lateral stripes, with a faint indication of a capillary median vitta; lateral stripes relatively short; scutum gray, the lobes brown; scutellum and postnotum dark brown with a dark gray pruinosity. Pleura gray. Halteres pale, the knobs scarcely

darker. Legs with the coxæ dark brown, gray pruinose; trochanters brown; femora brownish yellow, passing into brown at the tips; tibiae and basal segments of the tarsi pale brown, the tips of the segments still darker; terminal tarsal segments uniformly dark. Wings nearly hyaline, the stigma a very little darker; veins brown. Venation:  $Sc_2$  far before the origin of  $R_s$ ; outer deflection of  $R_2$  more than twice its length from the fused tip of  $R_1$  and  $R_2$ ;  $r-m$  near one-fourth the length of the deflection of  $R_{4+5}$ .

Abdomen dark brown throughout, gray pruinose. The long, powerful valves of the ovipositor yellowish horn-color.

*Habitat:* Japan (Taiwan). Holotype, ♀, Arisan, altitude about 7,500 feet, May 9, 1922 (K. Takeuchi).

*Tricyphona arisana* is most closely related to the Indian *T. glabripennis* (Brunetti).

#### Rhaphidolabina Alexander.

##### Rhaphidolabina dicranotoides, sp. n.

General coloration pale yellowish white, the head light gray pruinose; antennæ pale, the scape darker; wings with a faint yellowish tinge, the veins sparsely variegated with dark brown; wing-base conspicuously white;  $r$  and  $m$  present.

*Female.* Length 5.6–6 mm.; wing 5.8–7 mm.

Rostrum gray pruinose; palpi yellow. Antennæ with the scape pale brown, the flagellum pale yellow. Head light gray pruinose.

Thorax pale yellowish white, the pronotum and mesonotum dusted with white. Halteres pale yellowish white. Legs white, the femoral tips, the tibiae and tarsi very faintly darker. Wings with a faint yellowish tinge, the veins sparsely variegated with brown to produce a guttulate appearance; the principal dots occur on vein  $R$  at base, at  $Sc_2$  and adjoining parts of  $Sc$  and  $R$ ; origin of  $R_s$  and adjoining parts of  $R$ ; along the cord and outer end of cell  $1st M_2$ ; at  $R_2$  and adjoining part of veins which it connects; tips of the longitudinal veins at the wing-margin; fork of  $M_{1+2}$  and less distinct dots at intervals along the longitudinal veins beyond the cord; veins yellow except in these infuscated areas; prearcular cells conspicuously white. Venation:  $Sc_2$  far before the origin of  $R_s$ , the distance about equal to the last section of  $R_1$ ;  $R_s$  long, strongly arcuated to angulated and spurred at origin;  $r$  present, in the exact position where found in *Dicranota*; basal deflection of  $R_5$  very short;  $m$  present, closing cell  $1st M_2$ ; basal deflection of  $Cu_1$  a short distance beyond the fork of  $M$ .

Abdomen pale yellowish brown, clearer basally. Ovipositor with the valves brown, gently upcurved.

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

*Rhaphidolabina dicranotoides* has a venation that is almost exactly like a *Dicranota* but a comparison with related species, especially *R. gibbera* Alexander (Japan) shows that it is to be referred to *Rhaphidolabina*.

#### Tipula Linnæus.

##### Tipula foliacea, sp. n.

Related to *T. himalayensis* Brunetti; general coloration brownish yellow, the praescutum with three brown stripes, the median one bisected; apex of halteres yellow; femora black with a conspicuous yellow subterminal ring; male hypopygium with each lateral angle of the ninth tergite produced caudad into a long foliaceous blade.

*Male.* Length about 13.6 mm.; wing 18.3 mm.

Frontal prolongation of the head obscure yellow, the elongate nasus concolorous, the sides and lower surface infuscated; palpi dark brown. Antennæ of moderate length, if bent backward extending about to the wing-root; basal segment fulvous, the second segment yellow; flagellar segments bicolorous, the weak basal enlargement black, the remainder of the segment yellow; terminal flagellar segments passing into uniform brown. Head brownish fulvous, the vertical tubercle more yellowish, with a brown spot at its base at the narrowest point of the vertex.

Mesonotal praescutum brownish yellow, with three brown stripes, the median stripe split by a capillary pale vitta to appear double; scutum grayish brown, each lobe with two confluent brown areas; scutellum and postnotum brownish yellow, indistinctly darker medially. Pleura obscure yellow, sparsely and indistinctly variegated with darker. Halteres yellow, the base of the knob conspicuously dark brown. Legs with the coxæ and trochanters yellow; femora black, the bases yellow, each femur with a broad, conspicuous, subterminal yellow ring that is broader than the black apex; remainder of the legs black; tarsi long and slender. Wings faintly tinged with yellow, the base and cells  $C$  and  $Sc$  bright yellow; a heavy brown clouded pattern, as follows: A spot at origin of  $R_s$ , the stigma and a confluent seam along the anterior cord and a seam along vein  $Cu$  darker; the remaining paler clouds are much as in *T. arisanensis* Edwards or *T. biserra* Edwards. Venation: Petiole of cell  $M_1$  a little shorter than  $m$ ; fusion of  $M_3$  and  $Cu_1$  short.

Abdomen brownish yellow, the terminal segments passing into black. Hypopygium black, the foliaceous apices of the lateral lobes of the ninth tergite yellowish. Male hypopygium with the ninth tergite of quite unusual shape, the lateral angles produced caudad and slightly ventrad into long, foliaceous blades that are obliquely bidentate at their tips, the median caudal area of the tergite squarely truncated, with a tiny V-shaped median notch subtended on either side by a small reddish projection. Ninth sternite and basistyle simple. Eighth sternite unarmed.

*Habitat:* Japan (Taiwan). Holotype, ♂, Arisan, altitude 7500 feet, May 9, 1922, (K. Takeuchi).



## Nephrotoma Meigen.

**Nephrotoma takeuchii**, sp. n.

General coloration velvety-black, the praescutum with three straight, shiny black stripes; abdominal segments two to four orange; wings strongly tinged with brown.

*Male*. Length 12 mm.; wing 10.5 mm. *Female*. Length 13 mm.; wing 11 mm.

Frontal prolongation of the head and the palpi black. Antennæ black throughout, of moderate length, the flagellar segments feebly incised; antennæ of female shorter. Head black, with a broad orange triangle on vertex, the anterior end occupying the vertical tubercle; a large black orbital spot behind each antennal fossa; occipital region black, the brand shiny.

Pronotum, mesonotum and pleura black, the praescutum velvety black with three shiny black stripes, the lateral stripes straight; scutal lobes and scutellum shiny. Halteres dark brown. Legs with the coxæ and trochanters black; femora black, the central portion of the posterior femora fading into brown in the female, brownish yellow in the male; remainder of the legs black. Wings strongly tinged with brown, the cells beyond the cord and the Anal cells a little paler; costal region more saturated; stigma dark brown; veins dark brown. Venation: *Rs* one-half longer than the basal deflection of *R*<sub>4+5</sub>; cell *M*<sub>1</sub> barely sessile; *m-cu* preserved, at the fork of *M*.

Abdomen with segments one, six to nine, and the extreme caudal margin of the fifth tergite in the male black, the intermediate segments conspicuously orange.

*Habitat*: Japan (Taiwan). Holotype, ♂, Urai, altitude about 1,500 feet, April 20, 1922 (K. Takeuchi). Allotopotype, ♀.

This striking *Nephrotoma* is named in honor of the collector, to whom I am very greatly indebted for many Tipulidæ from Honshiu and Taiwan.