

**UNDESCRIBED SPECIES OF JAPANESE TIPULIDAE
(DIPTERA). Part I***

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At this time I am describing various new species of crane-flies from Shikoku, collected chiefly by Mr. Toshiro Yano, with a few further forms taken by Mr. Terunori Mohri, both members of the Shikoku Entomological Society. I am greatly indebted to these entomologists for this continued work on the rich and interesting Tipulid fauna of the island. Through the generosity of the collectors and Dr. Ishihara I am permitted to retain the types of the novelties in my collection of World Tipulidae.

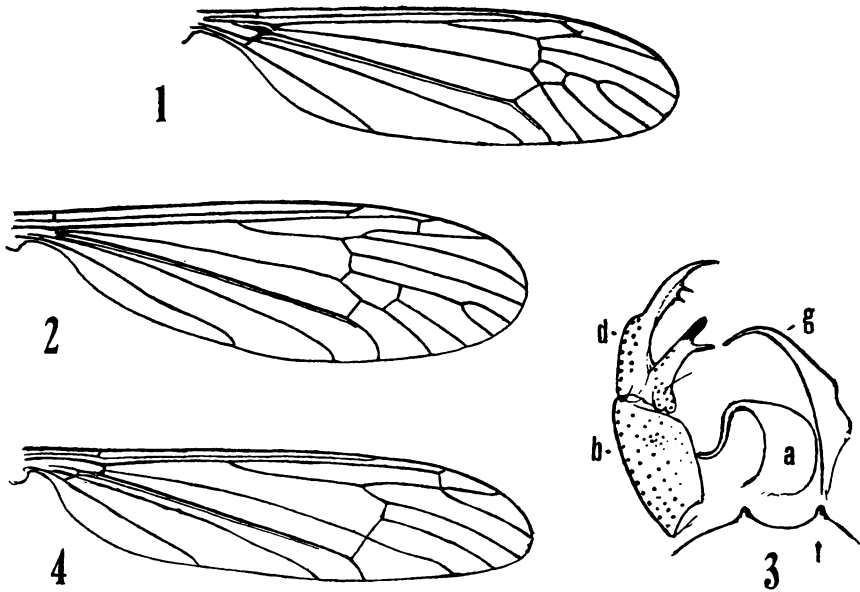
Tipula (*Oreomyza*) *geisha* sp. nov.

General coloration of the praescutum buffy with three gray stripes, the remainder of the thorax chiefly light gray; frontal prolongation of head obscure yellow, narrowly light gray on the dorsal surface; antennae chiefly yellow; femora and tibiae obscure brownish yellow, the tips narrowly darker; wings light yellow, conspicuously patterned with brown, especially beyond the cord; outer radial field darkened, the membrane adjoining the veins narrowly light yellow; vein R_{7+2} chiefly atrophied, represented by a basal spur; abdomen deep yellow, the tergites with a narrow broken black median stripe; cerci slender, straight.

♀.- Length about 13 mm.; wing 13.5 mm.; antenna about 2.2 mm.

Frontal prolongation of head obscure yellow, narrowly light gray pruinose on the dorsal surface; nasus long and slender; palpi relatively short, basal segment yellowish brown, succeeding segments dark brown, the extreme tip of the last segment paler. Antennae with basal three segments yellow, the remainder chiefly yellow with the basal enlargements weakly infuscated. Head above light gray, with a capillary dark brown median vitta; vertical tubercle low. Pronotum gray. Mesonotal praescutum buffy, with three gray stripes, the central one on posterior third narrowly divided by a pale line; setigerous punctures of the interspaces brown; posterior sclerites of notum gray, the scutal lobes scarcely patterned with darker. Pleura light gray, the posterior sclerites still paler; dorsopleural membrane yellow. Halteres brownish yel-

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1. *Tipula (Oreomyza) geisha* sp. nov.; venation. 2. *Limnophala (Prionolabis) isis* sp. nov.; venation. 3. *Limnophala (Prionolabis) isis* sp. nov.; male hypopygium. 4. *Hexatoma (Hexatoma) perproducta* sp. nov.; venation. (Symbols: a, aedeagus; b, basistyle; d, dististyle; g, gonapophysis; t, ninth tergite).

low, the apex of the knob light yellow. Legs with the coxae light gray; trochanters brownish yellow; femora obscure brownish yellow, the tips vaguely darker; tibiae yellowish brown, the tips more extensively infuscated; tarsi brown, passing into black. Wings (fig. 1) with the ground light yellow, the prearcular field and cell *Sc* more saturated, cell *C* slightly more infuscated, especially at outer end; stigma dark brown, confluent with a paler brown area over the anterior cord; a small brown spot at origin of *Rs*; wing tip infuscated, more extensively so in the outer radial field, in cell *R*₂ involving the outer two-thirds of the cell; a relatively broad poststigmatal yellow band extending from *C* backward, becoming paler behind; basad of cord with paler brown washes, at near midlength and at outer end of cell *M*₁, outer end of cell *1st A* and more vaguely in cell *2nd A*; extreme margin in medial field and again in cell *2nd A* narrowly darkened; veins yellow, in the outer radial field narrowly involving the membrane adjoining the veins. Venation: Vein *R*₁₊₂ chiefly atrophied, its base preserved as a short pale spur with two or three trichia; vein *R*₃ long and straight, nearly one-half longer than *R*₂₊₃; cell *M*₁ about twice its petiole; cell *1st M*₂ irregularly pentagonal, *m* being the shortest element. Abdomen deep yellow, the tergites with a narrow but conspicuous broken black median stripe that is broadly interrupted at the posterior borders of the segments; genital shield orange; cerci slender, straight.

Holotype, ♀, Saragamime, Iyo, Shikoku, July 4, 1953 (Mohri).

This beautiful crane-fly is most nearly allied to *Tipula* (*Oreomyza*) *autumna* Alexander and *T. (O.) hibii* Alexander, both of which differ in the coloration of the body, wings and legs, and in the details of venation. The male sex is unknown in *hibii* and in the present fly.

***Limonia* (*Libnotes*) *charmosyne* sp. nov.**

Size medium (wing about 10 mm.); general coloration dark gray; antennae black throughout; halteres yellow, knob a little darker; legs brownish black to black, the femoral bases broadly yellow, most extensively so on the posterior legs; wings yellow, with a pale brown pattern that appears chiefly as crossbands and the broad posterior border; supernumerary crossveins in cells R_3 and R_5 .

♂.-Length about 8-8.5 mm.; wing 10-11 mm.

♀.-Length about 11 mm.; wing 10-10.5 mm.

Rostrum and palpi black. Antennae black throughout; flagellar segments globular, terminal one elongate; verticils very inconspicuous. Head dark gray; anterior vertex carinate, this possibly abnormal and caused by shrinkage, narrow, less than one-third the diameter of scape. Pronotum dark brownish gray. Mesonotum almost entirely dark gray, the praescutum with a somewhat darker brown central stripe, lateral stripes less evident. Pleura dark brownish gray; dorsopleural membrane paler. Halteres yellow, knob a little darker. Legs with cexae dark brown; trochanters obscure yellow; fore and middle femora brownish black to black, the proximal one-third to one-half yellow, posterior femora with about the outer one-sixth darkened; tibiae and tarsi dark brown to black; claws with outer spine large and conspicuous. Wings yellow, the prearcular and costal fields more saturated yellow; a conspicuous pale brown pattern, chiefly crossbanded, occurring at cord, over the supernumerary crossveins and outer end of cell $1st M_2$, and at wing tip, all joining a narrow to broader posterior border of the same color; other darkened areas at fork of Sc and as a broad seam along Cu ; veins pale brown in the patterned areas, yellow in the interspaces, prearcular and costal regions. Venation: Supernumerary crossveins in cells R_3 and R_5 , the former opposite or shortly before R_2 , the latter at or shortly beyond m , the latter arcuated, about twice the transverse basal section of M_3 ; $m-cu$ about one-third to one-half times its length beyond the fork of M . Abdomen dark brown, sparsely pruinose; hypopygium a trifle brightened; ovipositor and genital segment fulvous.

Holotype, ♂, Mount Ishizuchi, Iyo, Shikoku, 1800 meters, June, 16, 1956 (Yano). **Allotopotype**, ♀, July 17, 1953 (Yano). **Paratopotypes**, 1 ♂, 1 ♀, in fragmentary condition, with the type.

Superficially, *Limonia* (*Libnotes*) *charmosyne* is most like *L. (L.) diphragma* Alexander, of western China, differing in all details of coloration. It is entirely distinct from all other regional members of the subgenus. If *Laosa* Edwards is recognized as being a valid subgenus, the present fly will be placed therein. It was associated in nature with the even larger and more striking *L. (L.) kariyana* Alexander.

***Dicranota* (*Rhaphidolabis*) *yanoana* sp. nov.**

Size large (wing of male 7.6 mm.); general coloration gray, the praescutum with

four darker gray stripes; antennae 17-segmented, brownish black throughout; legs brownish yellow; wings brownish yellow, stigma darker brown; R_{2+3+4} distinct, subequal to $r-m$; male hypopygium with the median region of tergite truncate or nearly so, the tergal arms conspicuous; basistyle with outer apical angle produced into a powerful spine; phallosome with the gonapophyses broadly rounded, densely setuliferous.

♂.-Length about 7.5 mm.; wing 7.6 mm.; antenna about 1.4 mm.

Rostrum gray; palpi light brown. Antennae 17-segmented, dark brown or brownish black throughout; first flagellar segment cylindrical, succeeding segments oval or suboval, gradually decreasing in size outwardly, the terminal segment smallest. Head gray, somewhat darker on the posterior vertex; anterior vertex relatively narrow; vestiture pale, conspicuous. Pronotum gray. Mesonotal praescutum light gray with four darker gray stripes, the intermediate pair barely separated by a pale line; scutum gray, centers of lobes darker; scutellum gray, more reddened behind, parascutella reddish; postnotum gray. Pleura gray; dorsopleural membrane dirty white. Halteres with stem pale, knob weakly darkened. Legs with coxae brownish yellow, the fore pair darkest; trochanters yellow; remainder of legs obscure brownish yellow, the outer tarsal segments brownish black. Wings brownish yellow, the long-oval stigma darker brown; veins yellowish brown, with conspicuous trichia. Venation: Sc_1 ending about opposite midlength of vein R_{2+3} , Sc_2 far before the origin of R_s ; R_{2+3+4} subequal to $r-m$; R_{1+2} longer than R_2 ; cell M_2 open; $m-cu$ at near midlength of M_{3+4} . Abdomen dark brown, the subterminal segments still darker, forming a ring, hypopygium yellowish brown. Male hypopygium with the central region of the narrow tergite subtruncate to very feebly emarginate, provided with long conspicuous setae; tergal arms slender, elongate, gently sinuous, narrowed to the acute tip. Basistyle with the outer apical angle produced into a strong nearly straight spine, directed mesad, narrowed to the acute tip; interbase a small flattened blade, more or less sinuous or twisted, the tip obtuse. Two dististyles, the outer a small subcircular scoop, densely clothed with black spinelike setae; inner style larger, appearing as a flattened blade, with a small lobule on outer margin at near two-fifths the length; inner margin of style at near two-thirds the length with three powerful setae. Phallosome with the gonapophyses appearing as flattened broadly outuse blades, the surface densely covered with short pale setulae; mesal part of each apophysis produced inward, contiguous at midline; aedeagus relatively small.

Holotype. ♂, Omogokei, Iyo, Shikoku, 700-800 meters. May 8, 1955 (Yano).

I take great pleasure in dedicating this very distinct fly to the collector, Mr. Toshiro Yano, who has added most materially to our knowledge of the Tipulidae of Shikoku. *Dicranota (Rhaphidolabis) yanoana* is entirely different from the outer regional species of the subgenus that have the antennae 17-segmented, these including *D. (R.) babai* Alexander and *D. (R.) polymera* Alexander. The structure of the male hypopygium is distinctive, particularly the basistyle and phallosome.

***Limnophila (Prionolabis) isis* sp. nov.**

Size small (wing of male 6.5 mm.); body black throughout; antennae 16-segmen-

ted; halteres whitened; femora brownish yellow, with about the outer fifth blackened; wings weakly tinged with yellow, restrictedly patterned with pale brown; no darkened seam along vein Cu ; cell M_1 shorter than its petiole; male hypopygium with the posterior border of tergite broadly emarginate, the ends of the notch produced into small rounded knobs; outer dististyle with about two slender lateral spines, inner style with a single small erect lateral spine; gonapophysis unusually long and slender, pale yellow, very gradually narrowed into a long apical filament.

♂.-Length about 5.5 mm.; wing 6.5 mm.

Rostrum and palpi black. Antennae of male short, 16-segmented, black throughout; flagellar segments suboval, shorter than the longest verticils. Head black. Thorax uniformly black. Halteres whitened. Legs with coxae and trochanters black; femora brownish yellow, clearer yellow basally, the tips broadly blackened, including approximately the outer fourth or fifth; tibiae light brown, the tips narrowly brownish black; tarsi black. Wings (fig. 2) weakly tinged with yellow, the prearcular and costal fields somewhat clearer yellow; stigma oval, pale brown; narrow pale brown seams at origin of Rs , cord and outer end of cell $1st M_2$; no darkened seam along vein Cu as common in the subgenus; veins brown, more yellowed in the brightened fields. Venation: Sc_1 ending opposte the fork of R_{2+3+4} , Sc_2 not far from its tip; R_{2+3+4} only a trifle longer than the basal section of R_5 ; cell M_1 shorter than its petiole; $m-cu$ at near midlength of M_{3+4} . Abdomen, including hypopygium, black. Male hypopygium (fig. 3) with the posterior border of tergite, t , broadly but shallowly emarginate, the ends of the notch produced into small rounded knobs. Outer dististyle with the fleshy setigerous part involving about the basal half, the outer part produced into a long gently curved spine, the upper margin with about two strong spines or teeth; inner style with the axis produced into a smooth blackened lobe, with a single smaller erect lateral spine, the base of style produced backward into a large weakly emarginate lobe. Gonapophysis, g , unusually long and slender, pale yellow, narrowed very gradually into the long apical filament. Aedeagus large, broadly compressed, apical filament long.

Holotype. ♂, Mount Hukumi, Iyo, Shikoku, May 10, 1953 (Mohri).

The male hypopygium of the present fly is most like that of *Limnophila* (*Prionolabis*) *atrofemorata* Alexander, which differs in the very large size, entirely blackened legs, and other characters. In general appearance, the species is more like *L. (P.) acutistylus* Alexander and other allied forms, differing particularly in the structure of the hypopygium.

***Limnophila* (*Prionolabis*) *majorina* sp. nov.**

Size large (wing of male over 9 mm.); coloration of body black, the surface opaque by a sparse pruinosity; median praescutal stripe more blackened, widened anteriorly; legs black, the extreme femoral bases yellowed; wings with a brownish tinge, stigma narrow, darker brown, cell M_1 lacking; male hypopygium with the posterior border of tergite nearly truncate; outer dististyle broad, outer surface microscopically scabrous, inner style with outer part relatively stout, the tip obtuse; gonapophysis black, trispinous at apex.

♂.-Length about 9 mm.; wing 9.5 mm.

Rostrum and palpi black. Antennae 16-segmented, black throughout; flagellar segments oval, shorter than the verticils. Head black, sparsely pruinose. Pronotum dull black. Mesonotum blackened but appearing gray by a conspicuous pruinosity; praescutum with a central more blackened stripe that is expanded anteriorly. Pleura uniformly dull gray; dorsopleural membrane darkened. Halteres yellow. Legs with the coxae and trochanters black; remainder of legs black, the extreme femoral bases obscure yellow. Wings with a brownish tinge, the prearcular field more yellowed; stigma narrow, darker brown; veins brown. Venation: R_s long, approximately two-thirds as long as R_1 ; cell M_1 lacking; $m-cu$ at near midlength of M_{3+4} . Abdomen black, opaque by a sparse pruinosity. Male hypopygium with the posterior border of tergite nearly truncate, the usual emargination virtually lacking. Outer dististyle broad, apex subacute, lateral spine small, outer surface microscopically scabrous; inner style blackened, the free outer part relatively stout, tip obtuse. Gonapophysis appearing as a slender black rod, trispinous, the axial spine curved, longest, with the second slightly stouter spine diverging from it; third spine strongly recurved. Aedeagus relatively narrow.

Holotype. ♂, Misaka-toge, Iyo, Shikoku, 716 meters, May 5, 1955 (Yano).

This unusually large species is most similar to *Limnophila (Prionolabis) liponeura* Alexander in the structure of the male hypopygium, especially the gonapophysis, differing in all other details. In nature it was associated with *L. (P.) extensa* sp. nov.

***Limnophila (Prionolabis) extensa* sp. nov.**

General coloration dull blackish gray, pruinose; antennae 16-segmented; halteres yellow; legs black; wings with cell M_1 lacking; male hypopygium with the outer dististyle flattened, the lower inner angle rounded, inner style with the base relatively narrow, outer half very slender, the tip simple; gonapophysis slender, beyond midlength with a small simple or bifid recurved spine on outer margin, the long outer spine simple, gently curved to the acute tip; aedeagus moderately flattened, the outer filament elongate.

♂.-Length about 6-6.5 mm.; wing 7-7.5 mm.

♀.-Length about 6.5 mm.; wing 7 mm.

Rostrum and palpi black. Antennae short, 16-segmented, black throughout; flagellar segments oval, subequal in length to the verticils, terminal segment longer. Head plumbeous. Pronotum and mesonotum dull blackish gray or plumbeous, praescutum unpatterned; posterior sclerites of notum and the pleura more heavily pruinose. Halteres pale yellow. Legs with the coxae gray; trochanters and remainder of legs black. Wings with a dusky tinge, the prearcular field more yellowed; stigma long-oval, darker brown; veins brown, yellow in the brightened basal area. Venation: R_{2+3+4} and basal section of R_5 subequal or the former slightly longer; cell M_1 lacking; $m-cu$ before midlength of M_{3+4} . Abdomen, including hypopygium, black. Male hypopygium with the posterior border of the tergite very gently concave, with a very small tubercle near each outer angle. Outer dististyle broadly flattened, outer surface scabrous,

outer apical angle narrowed to a point, lower inner angle rounded, not produced into a spine or point as in some other related species; inner style not strongly expanded at base, the narrowed outer half very slender, tip simple. Gonapophysis distinctive, slender, beyond midlength with a small recurved spine on outer margin, this simple or weakly bifid, beyond this point the apex gradually narrowed into a long simple gently curved spine. Aedeagus moderately flattened, the narrowed outer filament elongate.

Holotype, ♂, Misaka-toge, Iyo, Shikoku, 716 meters, May 5, 1955 (Yano). **Allotopotype**, ♀. **Paratopotypes**, 2♂ ♀.

Limnophila (Prionolabis) extensa is readily told from other regional members of the subgenus that have cell M_2 of the wings lacking and the inner dististyle of the male hypopygium simple at apex by the structure of the male hypopygium, particularly the dististyles and gonapophyses. Such allied species include *L. (P.) iyoensis* Alexander, *L. (p.) kunumiana* Alexander, *L. (P.) liponeura* Alexander, and *L. (P.) shikokuana* Alexander.

Hexatoma (Hexatoma) perproducta sp. nov.

Antennae of male exceeding three times the length of the body; general coloration gray, the praescutum with four darker grayish brown stripes; legs dark brown; wings with a grayish tinge; veins, with the exception of costa, virtually glabrous; R_2 at or close to fork of R_{2+3+4} .

♂.-Length about 5.5-5.8 mm.; wing 7.5-7.8 mm.; antenna about 20-21 mm.

♀.-Length about 6.5 mm.; wing 7 mm.; antenna about 1.2 mm.

Rostrum gray; palpi black. Antennae of male exceedingly long, more than three times the body, black; flagellar segments very elongate-cylindrical, with small scattered emergence bristles and dense pale pubescence of approximately equal length, on the upper surface only. Head gray, in male with a very large subglobular tubercle on the anterior vertex. In the female, antennae much shorter, as shown by the measurements; scape brownish gray, the remainder black; flagellar segments cylindrical, the first longest; vertical tubercle much smaller than in the male but still large. Pronotum brownish gray. Mesonotum gray, the praescutum with four darker grayish brown stripes; posterior sclerites of notum black, gray pruinose, centers of scutal lobes darker. Pleura dark gray. Halteres infuscated. Legs with coxae gray; trochanters brownish yellow; remainder of legs dark brown, the femoral bases not or scarcely darker. Wings (fig. 4) with a grayish tinge; stigma very vaguely indicated; veins brown. Veins, with the exception of costa, virtually glabrous, with two or three trichia on distal section of R_5 ; veins of medial field very delicate to semiatrophied. Venation: R_{2+3+4} elongate, subequal to R_5 , R_2 at or very close to its fork; R_3 subequal to the total length of vein R_5 ; *m-cu* close to the fork of M ; vein M_2 sinuous and slightly upcurved on outer half. Abdomen brownish black, including the hypopygium, surface sparsely pruinose.

Holotype, ♂, Iwazeki, near Matsuyama, Iyo, Shikoku, July 24, 1954 (Yano). **Allotopotype**, ♀, pinned with type. **Paratopotypes**, 2♂ ♂.

The present fly represents the extreme length of the antennae in the male of any known member of the subgenus. Among such forms the most similar is *Hexatoma* (*Hexatoma*) *prolixicornis* Alexander, of Kwangtung, southeastern China, which has the antennae of the male approximately twice that of the body (Length about 6 mm.; wing 6.5 mm.; antenna about 13.5 mm.).

Erioptera (*Psiloconopa*) *nigrohalterata* sp. nov.

Allied to *verna*; general coloration dark brown; knobs of halteres darkened; wings with cell M_2 open by the atrophy of m ; abdomen uniformly dark brown; male hypopygium with the outer dististyle broad, the apex truncate, with microscopic spicules; basistyle with the interbase a small hairlike spine from a long basal tubercle; filaments of aedeagus elongate, decussate at the midline.

♂.-Length about 2.8-3 mm.; wing 3.5-3.6 mm.

♀.-Length about 3.5 mm.; wing 3.5 mm.

Rostrum and palpi black. Antennae very short, black throughout; flagellar segments oval to shorter than the verticils. Head dark brown. Pronotum dark brown, the scutellum and pretergites restrictedly yellow. Mesothorax almost uniformly dark brown. Halteres infuscated, the knobs usually more strongly so, in cases somewhat more yellowed, as in *verna*. Legs with coxae dark brown, trochanters slightly paler; remainder of legs brown, the outer tarsal segments darker. Wings with a strong blackish tinge, veins darker. Venation: Sc long, Sc_1 ending just before R_2 , Sc_2 far retracted; R_{2+3} and R_2 subequal; cell M_2 normally open by the atrophy of m , in a single paratype the cell closed, with m very reduced, M_3 correspondingly longer; $m-cu$ before fork of M ; Anal veins divergent. Abdomen uniformly dark brown, the segments without yellow posterior rings, as in *verna*. Male hypopygium generally as in *verna*; outer dististyle much broader, expanded outwardly, the margin truncate and provided with microscopic spicules; inner style dusky, narrowed and arcuated at near two-thirds the length. Basistyle with the interbase a small hairlike spine from a long basal tubercle. Gonapophysis long and slender, much longer than the interbase. Aedeagus with the apical filaments elongate, decussate at the midline.

Holotype, ♂, Matsuyama, Iyo, Shikoku, April 3, 1955 (Yano). **Allotopotype**, ♀. **Paratopotypes**, 4 ♂ ♀.

Although it is generally similar to *Erioptera* (*Psiloconopa*) *verna* Alexander, the present fly is distinct in the darkened halteres and abdomen and especially in the structure of the male hypopygium, particularly the dististyles, interbase and aedeagus.