

UNDESCRIBED CRANE FLIES FROM THE HOLARCTIC REGION IN THE UNITED STATES NATIONAL MUSEUM

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The crane flies (Tipulidae) described at this time were included in large series sent to me for determination by Dr. J. M. Aldrich and Dr. H. G. Dyar, the majority having been collected by them in the Western States and Canada. The material from western China was collected by the Rev. D. C. Graham and presented by him to the national collection. I wish to express my thanks to these gentlemen for their kind cooperation in making known these neglected flies. The types are preserved in the collection of the National Museum, with the exception of that of *Dicranoptycha occidentalis*, new species.

PALAEARCTIC SPECIES

BRITHURA NYMPHICA, new species

General coloration rich brown; antennal flagellum yellow; dorso-pleural region of thorax conspicuously ochreous; ventral portion of the pleurotergite produced into a flattened lobe, the cephalic side of which is densely velvety; femora yellow, the tips conspicuously blackened; wings brown, sparsely variegated with yellow; Sc_1 lacking; $r-m$ reduced; $m-cu$ long and sinuous, longer than the distal section of Cu_1 .

Female.—Length about 38 mm.; wing, 24 mm.; abdomen alone, 25 mm.; its greatest width, 6.4 mm.

Frontal prolongation of the head long, dark chestnut brown, the nasus long and powerfully developed; basal segments of palpi dark brown, the third segment paler, the last segment black with the extreme tip brightened. Antennae with the first scapal segment dark reddish brown, the second segment fulvous; flagellum pale yellow, the basal enlargement of the individual segments scarcely darker; verticils all basal in position, very long and conspicuous, including those of the reduced terminal segment. Head dark brown, the orbits paler; vertical tubercle conspicuous, the tip slightly decurved.

Pronotum dark clove brown, the lateral margins paler, the scutellum brighter, narrowly margined anteriorly with black. Mesonotal praescutum brown with four barely evident brighter brown stripes, the posterior sclerites of the mesonotum generally of this same bright brown. Pleura brown, the dorso-pleural region extensively and conspicuously pale ochreous; ventral sclerite of the pleurotergite produced laterad into a conspicuous triangular flattened lobe, the cephalic face of which is densely covered with a cream-colored velvety pile. Halteres brownish yellow, the knobs dark brown. Legs with the coxae and trochanters dark cinnamon brown; femora yellow, the tips rather broadly (2 mm.) and conspicuously blackened; tibiae brownish yellow, the tips narrowly infuscated; tarsi light brown, the outer segments darker. Wings of the usual *Brithura* type, the membrane yellowish, extensively variegated with darker, or brown, sparsely variegated with yellow; prearcular region largely pale; cell *C* darker brown, *Sc* more yellowish; stigma relatively pale, with brighter yellow markings before and beyond it; a small darker brown spot at origin of *Rs*, preceded and followed by the yellow markings described; anterior cord a little seamed with darker; a small yellow area near outer end of cell *R*₃; similar yellow marginal areas in cells *R*₅ to *M*₄, inclusive, with two similar markings in the first anal and another in the second anal cells, these latter areas lying not far from the veins; a small brown cloud in cell *Cu* not far from midlength; a pale yellow, gently arcuated transverse area across the outer end of cell *M*; vein *Cu*₁ beyond this mark, as well as *m-cu* conspicuously seamed with dusky; outer end of cell *first M*₂, fork of *M* and marginal spots at the ends of the veins, as well as the wing apex in the radial field, and the posterior margin of the wing in the anal cells, more dusky. Venation (fig. 1): *Sc*₁ lacking; *Sc*₂ ending just before *r*, the latter close to the fork of *R*₂₊₃; *r-m* reduced; cell *first M*₂ pentagonal; petiole of cell *M*₁ a little longer than *m*; *m-cu* strongly arcuated, longer than the distal section of *Cu*₁ inserted on *M*₄, shortly beyond its origin; *Cu*₂ attaining the margin at the end of *Cu*₁; cell *second A* wide.

Abdomen rich cinnamon brown, the lateral region of the tergites broadly darker brown; caudal margins of the segments narrowly and obscurely, the extreme caudo-lateral angles more brightly yellowish, most conspicuous on segments two and three; sternites somewhat darker brown, the caudal margins more sooty brown, the extreme lateral angles of the segments again with yellow triangles. Dorsal shield of ovipositor obscure yellow, the conspicuous tergal valves dark chestnut horn color.

Habitat.—China (Szechuen). *Holotype*, female, Shin Kai Si, Mount Omei, altitude 4,400 feet, September 10, 1922 (D. C. Graham).

Type.—Female, Cat. No. 40317, U.S.N.M.

The species is readily distinguished from all described forms by the coloration of the antennae and legs.

ERIOCERA GRAHAMI, new species

Head and thorax velvety black, the scutellum orange; abdomen with tergites one to four orange, all except the first with a narrow black border along the caudal margin; remaining tergites black; wings blackish; cell M_1 present.

Female.—Length, 20 mm.; wing, 17 mm., the greatest width, 5.4 mm.

Rostrum and palpi black. Antennae brownish black throughout, if bent backward not attaining the wing root. Thorax velvety black, the scutellum orange. Halteres and legs black. Wings relatively broad, blackish, the base and costal region darker; veins a little darker than the ground color. Venation (fig. 2): R_s long, about one-third longer than R ; Sc_1 ending beyond the fork of R_{2+3+4} , the latter equal to the basal section of R_5 ; basal section of R_2 transverse, R_{2+3} equal to one-half R_{1+2} ; cell M_1 present, shorter than its petiole; $m-cu$ at about two-fifths the lower face of cell *first* M_2 , straight, about one-third longer than the gently arcuated distal section of Cu_1 ; cell Cu at wing margin about two-fifths as wide as cell M_4 .

Abdominal tergites 1 to 4 orange, the lateral margins weakly infuscated, segments 2 to 4 with a very narrow but conspicuous black line across the caudal margin, the segments without shiny bands; tergites 5 to 8, velvety black; sternites similar, but the black caudal margins of the basal segments lacking. Ovipositor with the dorsal shield brownish black dorsally; tergal valves of ovipositor broken.

Habitat.—China (Szechuen). *Holotype*, female, Shin Kai Si, Mount Omei, altitude 4,400 feet, July 1–30, 1925 (D. C. Graham).

Type.—Female, Cat. No. 40318, U.S.N.M.

This interesting crane-fly is named in honor of the collector, the Rev. David C. Graham, who has added greatly to our knowledge of the zoology of western China. By Edwards's key to the Old World species of *Eriocera*¹ this species runs to *E. umbripennis* Edwards (Penang), an entirely distinct species.

ERIOCERA FUMIDIPENNIS, new species

General coloration dull gray, the praescutum with three blackish stripes; legs black, elongate; wings relatively long and narrow, strongly blackish, the costal margin darker; R_{1+2} about one-half longer than R_2 ; R_{2+3} and R_3 subequal; R_{2+3+4} shorter than the basal section of R_5 ; cell M_1 present.

Male.—Length about 17.5–18 mm.; wing, 16.5–18 mm.

¹Ann. Mag. Nat. Hist., ser. 9, vol. 8, pp. 67–78, 1921.

Rostrum and palpi brownish black. Antennae relatively short, brownish black throughout, if bent backward, scarcely attaining the wing root. Head dull brownish gray, the vertical tubercle low and relatively inconspicuous, blackish. Mesonotum blackish, with a dull brownish gray pruinosity, the praescutum with three blackish stripes. Pleura gray, variegated with blackish areas. Halteres brownish black, the base narrowly brightened. Legs with the coxae gray; trochanters brownish gray; remainder of legs black, elongate (hind leg, femur, 13 mm.; tibia, 14 mm.; tarsus, 11.6 mm.). Wings relatively long and narrow, strongly blackish, the costal margin darker; stigma small, oval, darker brown than the ground color; veins dark. Venation: Sc_1 , ending about opposite three-fourths R_{2+3} , Sc_2 some distance from its tip; R_s long, strongly angulated at origin; R_{2+3+4} shorter than basal section of R_3 ; R_{1+2} about one-half longer than the basal section of R_2 , or a little less; R_{2+3} subequal to R_3 ; $r-m$ in alignment with the inner end of cell *first* M_2 ; cell M_1 present, a little shorter than its petiole; $m-cu$ not far beyond the fork of M , about one-third longer than the distal section of Cu_1 .

Abdomen blackish, sparsely pruinose, the hypopygium concolorous.

Habitat.—China (Szechuen). *Holotype*, male, Suifu, May–June, 1921 (D. C. Graham). *Paratopotype*, male.

Type.—Male, Cat. No. 40319, U.S.N.M.

By Edwards's key to the Old World *Eriocera*² this fly would run to *E. rubrescens* Walker (Borneo), a very different species.

ERIOCERA CYBELE, new species

Velvety black; abdominal tergites 1, 2, 4, and 5 with basal glabrous rings; genital segment of female fulvous; wings black with a long, narrow, white, transverse band before the cord; R_2 oblique.

Male.—Length, about 13 mm.; wing, 11.5 mm.

Female.—Length, 19 mm.; wing, 16 mm.

Head and appendages velvety black.

Thorax entirely velvety black, including the halteres and legs. Wings black, the anal cells somewhat paler; a long, narrow, transverse, discal, white area, extending from vein R_1 , before the cord, nearly to the posterior margin of the wing in cell Cu . Venation: Basal section of R_2 oblique to subtransverse in position, less oblique than in *E. obliqua*; cell R_3 longer and narrower than in the last-named species.

Abdomen velvety black, the segments relatively short; tergites 1 and 2 with shiny glabrous basal rings of silvery gray; segments 4 and 5 similar but the rings opaque; tergite 3 uniformly black except for a very narrow glabrous basal ring. Male hypopygium entirely

² Ann. Mag. Nat. Hist., ser. 9, vol. 8, 1921.

black. Female with the genital segment bright fulvous, the elongate valves of the ovipositor more horn-colored.

Habitat.—China (Szechuen). *Holotype*, male, Shin Kai Si, Mount Omei, altitude 4,400 feet, July 1-30, 1921 (D. C. Graham).

Allotopotype, female. *Paratopotype*, female.

Type.—Male, Cat. No. 40320, allotype, female, U.S.N.M.

Eriocera cybele is another of the numerous recently discovered species of the genus that run to *E. hilpa* Walker, by Edwards's key to the Old World species of the genus.³ It is most closely allied to *E. obliqua* Alexander, of Macao,⁴ differing in the longer and narrower white crossband of the wing and the slightly different venation. The ovipositor has the genital segment bright fulvous, the valves only a little duller in color. In *E. obliqua*, the genital segment is black, the valves dark horn color.

ERIOCERA ARROGANS, new species

Head black; antennae short; thorax dull black with three shiny blackish gray stripes; legs dark brown; wings gray, the veins before the cord broadly margined with rich yellowish brown, beyond the cord similarly margined with darker brown; cell M_1 present, deep; abdomen black, including the genital shield.

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

Rostrum and palpi black. Antennae brownish black, the outer flagellar segments somewhat paler; antennae short, if bent backward not attaining the wing root. Head dull black, the vertical tubercle not conspicuous.

Mesonotum intense dull black, the praescutum with three broad shiny blackish gray stripes that are virtually confluent behind, restricting the ground color to the humeral triangles and broad lateral margins; remainder of notum of the same shiny blackish gray as the praescutal stripes. Pleura shiny blackish gray. Halteres black, the knobs broken. Legs with the coxae and trochanters black; remainder of legs dark brown, the femoral bases a trifle paler; legs relatively short (fore leg, femur, 5.6 mm.; tibia, 7 mm.; tarsus about 5.8 mm.). Wings with the very restricted ground-color gray, the base and costal region darker; all veins before the cord broadly margined with rich yellowish brown, restricting the ground color to median streaks in the principal cells; beyond the cord the color changes abruptly to darker brown, with similar pale centers to the cells; anal sells more extensively grayish; vein *second A* conspicuously seamed with brown; veins dark brown, *C* and *Sc* paler brown. Venation (fig. 3): Sc_1 ending opposite the fork of R_{2+3+4} , Sc_2 just

³ Ann. Mag. Nat. Hist., ser. 9, vol. 8, 1921.

⁴ Proc. Hawaiian Ent. Soc., vol. 5, pp. 255-256, 1923.

beyond the fork of R_s ; R_s angulated and weakly spurred at origin; R_{2+3+4} a little longer than R_{2+3} ; R_{1+2} twice the length of R_2 , or a little more; R_{2+3} about one-half longer than R_2 ; R_4 deflected rather conspicuously toward the wing-tip at outer end; cells R_3 and R_4 with inner ends acute; cell M_1 present, relatively deep, nearly twice its petiole; $m-cu$ beyond one-third the length of cell *first* M_2 , a little shorter than the distal section of Cu_1 .

Abdomen dull black, including the genital shield; valves of the ovipositor horn colored; tergal valves slender, gently upcurved to the acute tips.

Habitat.—China (Szechuen). Holotype, female, Mount Omei (D. C. Graham).

Type.—Female Cat. No. 40321, U.S.N.M.

A very distinct species of the genus, without any very close allies among the described species.

NEARCTIC SPECIES

LIMONIA NITIDIUSCULA, new species

Antennae dark brown throughout, the flagellar segments with elongate verticils; last flagellar segment very long, nearly as long as the combined twelfth and thirteenth segments; praescutum obscure yellow, with a broad dark brown median stripe; femora brown, the tips narrowly yellowish; wings with a strong brownish tinge, the stigma darker, with a paler spot before and beyond it; male hypopygium with the dorsal dististyle a powerful chitinized rod, the apex with a flattened black plate that terminates in a comb of about nine blunt teeth.

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

Rostrum and palpi black. Antennae dark brown throughout; basal flagellar segments shorter, gradually increasing in length and decreasing in diameter outwardly, the segments with a short apical and similar basal glabrous portion, forming a short pedicel; all segments with verticils of unusual length, much exceeding the segments, except those of the unusually long terminal segment; this segment very long and slender, only a little shorter than the two preceding segments taken together. Head dark colored, the anterior vertex more silvery.

Mesonotum obscure yellow, the praescutum with a broad dark brown median stripe and less distinct lateral stripes, the lateral margins and humeral region shiny yellow; scutal lobes yellow, extensively marked with brown; scutellum and postnotum largely dark. Pleura obscure shiny yellow with a very broad, conspicuous, longitudinal brown stripe and a less distinct brown mark on the sternopleurite, the remainder of the sternum of the ground color. Halteres

with the unusually long knobs dark brown, the base of the stem narrowly paler. Legs with the coxae and trochanters obscure yellow; femora brown, paler basally, the color deepening outwardly, the tips narrowly but conspicuously light yellow; tibiae and tarsi dark brown. Wings with a strong brownish tinge, the stigma oval, darker brown; a paler spot before and beyond the stigma; veins darker brown, the obliterative areas at end of *Rs* and across cell *first M*₂ conspicuous; vein *R*₄₊₅ dark and equally developed throughout its length. Venation: *Sc*₁, ending about opposite one-third to one-fourth the length of *Rs*, *Sc*₂ at its tip; *Rs* gently arcuated; basal section of *R*₄₊₅ strongly arcuated; cell *first M*₂ relatively wide, only about one-half longer than wide; *m-cu* at the fork of *M*.

Abdominal tergites dark brown, the basal sternites obscure brownish yellow, the bases of the segments darker; segments eight and nine abruptly paler yellow; remainder of hypopygium dark. Male hypopygium (fig. 4) with the ninth tergite (*t*) gently emarginate posteriorly, the lateral portions provided with a few very long setae. Basistyle (*b*) relatively elongate, the mesal lobe large, densely setiferous. Dorsal dististyle a powerful, nearly straight, chitinized rod, at the apex with a blackened flattened plate that terminates in a comb of about nine blunt teeth. Ventral dististyle (*d*) small, fleshy, densely setiferous, the rostral prolongation a long, sinuous rod, at near midlength bearing two long black spines from elongate swollen papillae. Gonapophyses (*g*) with the mesal apical angle greatly produced into a long flattened blade, the apex very shallowly bifid.

Habitat.—Oregon. *Holotype*, Marshfield (J. M. Aldrich).

Type.—Male. Cat. No. 40322, U.S.N.M.

The present species appears to be closely allied to *L. adjecta* (Doane), but I can not reconcile the descriptions of the two. The present species has the anterior vertex silvery, the praescutum with a broad median stripe and the wings strongly infumed, with pale areas before and beyond the stigma. Vein *R*₁ does not behave at all as described and figured by Doane for *adjecta*, but bends at a right angle into the costa, immediately opposite *R*₂. The very elongate last segment of the antenna, the long flagellar verticils, the conspicuous yellow terminal ring of the femora and the very peculiar structure of the hypopygium are all noteworthy features of the present species.

DICRANOMYIA PENICILLATA, new species

Related to *D. haeretica* Osten Sacken, from which it is distinguished especially by the structure of the male hypopygium; dorsal dististyle slender, sickle shaped; base of ventral dististyle on inner face with a low lobe bearing two conspicuous pencils of long yellow setae.

Male.—Length about 6.2 mm.; wing, 6.8 mm.

Rostrum and palpi dark brown. Antennae brownish black throughout; flagellar segments oval. Head dark.

Pronotum obscure yellow, with a narrow median brown line. Mesonotal praescutum with three brown stripes, the ground color well concealed by yellowish gray pollen; scutal lobes dark, the median area obscure yellow; scutellum obscure yellow; postnotal mediotergite dark brown, sparsely pruinose, the lateral margins narrowly paler. Color of the pleura obscured by glue but apparently largely pale. Halteres short, pale, the knobs infuscated. Legs with the coxae and trochanters pale brown, the latter more yellowish; femora obscure yellow, the tips infuscated, especially the fore femora; tibiae brownish yellow, the tips becoming darker; tarsi passing into dark brown. Wings with a strong yellowish tinge, the stigma oval, very slightly darker than the ground color; veins dark brown. Venation: *Sc* short, *Sc*₁ ending just beyond the origin of *Rs*; *Sc*₂ not visible in the type, due to the flexing of the wings at this point, but presumably not far removed from the tip of *Sc*₁, as in the related *haeretica*; *Rs* about one and one-half times as long as the basal section of *R*₄₊₅; *m-cu* before the fork of *M*.

Abdominal tergites dark brown, the sternites yellow. Male hypopygium (fig. 5) relatively large and complicated in structure. Basistyle (*b*) darkened outwardly, the ventro-mesal lobe elongate, the apex truncated and provided with setiferous tubercles, with a few other setae on the mesal edge of the lobe; mesal face of basistyle near apex with a low squat tubercle densely set with setae. Dorsal dististyle (*d*) a slender curved hook, the apex acute. Ventral dististyle (*d*) large, widened distally, sparsely provided with long coarse setae; rostral prolongation stout, the two spines relatively short, separated from one another by a distance about equal to one-half the length of one, placed more than their own length from the apex of the prolongation; basad and ventrad of the rostrum a conspicuous low lobe, each outer angle of which bears a conspicuous pencil of long yellow setae. Gonapophyses (*g*) with the mesal apical prolongation slender. Aedeagus (*a*) subtended on either side by a flattened, shell-like apophysis.

Habitat.—North Dakota. *Holotype*, male, Minot, July 16, 1921 (H. G. Dyar).

Type.—Male, Cat. No. 40323, U.S.N.M.

DICRANOMYIA NEGLIGENS, new species

General coloration gray, the praescutum with three brown stripes, the median stripe narrowly split by a capillary pale line; halteres pale yellow, the knobs dark brown; femora yellow, the tips broadly dark brown, preceded by a slightly narrower ring of clearer yellow;

wings whitish subhyaline, with four conspicuous brown costal areas and sparse markings elsewhere on the wing.

Female.—Length, 6.5–7.5 mm.; wing, 8.2–10 mm.

Rostrum and palpi black. Antennae black, the basal half of the first flagellar segment yellow; flagellar segments oval, becoming smaller outwardly. Head gray, the center of the vertex marked with black.

Mesonotal praescutum gray with three conspicuous brown stripes, the median stripe narrowly split by a capillary pale line, the cephalic end of the stripe entire; scutum gray, the lobes variegated with brown; scutellum gray; postnotum brown, sparsely pruinose. Pleura gray. Halteres relatively short, pale yellow, the knobs dark brown. Legs with the coxae brown, darker basally; trochanters yellow; femora yellow, a little darker outwardly, the tips broadly dark brown, preceded by a slightly narrower clearer yellow ring; tibiae light brown, the extreme bases and the slightly broader tips infuscated; basitarsi light brown, passing into darker brown, the remaining tarsal segments dark brown. Wings whitish to whitish subhyaline, sparsely variegated with brown, including four larger costal blotches, the second at the supernumerary cross vein in cell *Sc*, the third at the tip of *Sc*₁ and origin of *Rs*, the fourth the stigmal area, barely confluent with a circular spot at the fork of *Rs*; cord and outer end of cell *first M*₂ narrowly seamed with darker brown; paler gray marginal clouds on vein *M*₃ and all veins beyond, largest and most conspicuous on the anal veins; smaller but darker marginal spots at ends of veins *R*₃ and *R*₄₊₅; a few scattered brown dots in cells *M*, *Cu*, and the *anal* cells, not more than four or five in a single cell, none in the radial field; veins dark brown, *C*, *Sc*, and *R* more yellowish in the interspaces. Venation: *Sc* relatively short, *Sc*₁ ending about opposite one-fourth the length of *Rs*, *Sc*₂ lacking, unless considered as being represented by the so-called supernumerary cross vein at midlength of cell *Sc*; *Rs* nearly straight; cell *first M*₂ gently widened outwardly, longer than vein *M*₃ beyond it; *m-cu* before the fork of *M*, approximately equal to or shorter than the distal section of *Cu*₁. One paratype has an adventitious cross vein in cell *R*₃ of both wings.

Abdominal tergites brownish yellow, variegated with dark brown. In other specimens the segments are dark brown, narrowly margined caudally with obscure yellow. Ovipositor with the basal half of the genital segment dark, the apical half obscure yellow. Valves horn color, the tergal valves relatively small, slender, gently upcurved, the tips acute.

Habitat.—Colorado. *Holotype*, female, Tennessee Pass, July 24, 1917 (J. M. Aldrich). *Paratopotypes*, 2 females.

Type.—Female, Cat. No. 40324, U.S.N.M.

Dicranomyia negligens is most closely allied to *D. nelliana* Alexander,⁵ likewise from Colorado. The wing-pattern is much more restricted in the present species and *Sc* is slightly longer. Both species bear a great resemblance to members of the *simulans* group of the genus *Limonia*.

DICRANOPTYCHA OCCIDENTALIS, new species

Generally similar to *D. sobrina* Osten Sacken; costal fringe of male short; male hypopygium with the terminal spine of the outer dististyle long and straight.

Male.—Length about 8 mm.; wing, 9 mm.

Rostrum dark gray, the palpi brownish black. Antennae with the scapal segments yellow, the flagellum dark brown, with long verticils. Head brownish gray.

Mesonotum dark gray, the praescutum with a scarcely indicated darker gray median area, the surface of the disk with a sparse yellow pollen, the lateral margins clearer gray. Pleura gray. Halteres pale, the knobs weakly infuscated. Legs with the coxae brownish yellow; trochanters yellow; remainder of legs brownish yellow, the tips of the femora and tibiae a little darkened; terminal tarsal segments dark brown. Wings with the costal fringe (male) short, the membrane strongly suffused with yellowish; *Rs* and cell *first M*₂ relatively short.

Abdomen generally dark brown, the subterminal segments somewhat darker. Male hypopygium about as in *D. quadrivittata* Alexander, but the outer dististyle longer and more slender, with the terminal spine long and straight, the spines on the outer face of the style more erect and conspicuous. Inner dististyle with the tip broadly rounded. Aedeagus blunt, not terminating in two rods, the subtending plates less broadly flattened apically. Lateral processes slender, each terminating in a more chitinized beak, without apical denticles.

Habitat.—California. *Holotype*, male, Alpine, April 10, 1915 (M. C. Van Duzee). *Paratypes*, a broken male, Muir Woods, Marin Co., May 19, 1915 (M. C. Van Duzee); a broken male Berkeley, May 14, 1915 (M. C. Van Duzee). The type is preserved in the writer's collection, through the kindness of Mr. M. C. Van Duzee.

The species mentioned above as *Dicranoptycha quadrivittata* Alexander was first described⁶ as a variety of *sobrina* Osten Sacken, but is now known to be amply distinct. It has the following distribution, as known:

Colorado: Peaceful Valley, August 25, 1917 (Cockerell); type.

⁵ Proc. Acad. Nat. Sci. Philadelphia, 1914, pp. 579-580, pl. 27, fig. 22.

⁶ Can. Ent., vol. 51, p. 191, 1919.

Idaho: Sandpoint, July 3, 1917 (H. G. Dyar); Lake Pend Oreille, July 4, 1917 (H. G. Dyar).

Montana: Glacier Park Station, altitude 4,800 feet, July 24, (J. M. Aldrich).

Alberta: Banff, July 10, 1918 (H. G. Dyar).

The species is told by the four usually distinct praescutal stripes. The male hypopygium has the outer dististyle unusually short and stout, strongly arcuated, blackened on the distal half, the apical spine relatively short, both the upper and lower faces of the style roughened but more especially the outer or convex face where the spines are large and conspicuous but strongly appressed. Inner dististyle short and stout, the apex blunt. Aedeagus terminating in two small parallel rods, subtended on either side by very broad flattened plates. Lateral process slender, carinate, the apex with microscopic denticles and roughenings.

LIMNOPHILA (EPHELIA) ALDRICHI, new species

General coloration dark brownish gray, the praescutum with four slightly darker brown stripes; halteres light yellow; femora and tibiae yellowish, the tips darkened; wings subhyaline, with a heavy brown pattern that is restricted to the vicinity of the veins; male hypopygium with the outer dististyle bearing a small triangular wing on outer margin at near two-thirds the length.

Male.—Length about 5.8–6.4 mm.; wing, 7.5–7.8 mm.

Female.—Length about 7 mm.; wing, 8.5 mm.

Rostrum and palpi dark. Antennae with the scapal segments dark; basal segments of the flagellum yellow, the outer segments passing into brown. Head brownish gray.

Mesonotal praescutum dark brownish gray with four slightly darker brown stripes, the intermediate pair narrowly separated from one another; pseudosutural foveae conspicuous, subcircular, black; remainder of mesonotum dark, heavily pruinose. Pleura dark brown, scarcely variegated with brighter. Halteres light yellow. Legs with the coxae brownish yellow, the middle coxae darker brown; trochanters obscure yellow; femora yellow, the tips rather broadly but not abruptly infuscated; tibiae yellow, the tips narrowly infuscated; tarsal segments obscure yellow, their tips narrowly darkened, the terminal tarsal segments uniformly darkened. Wings subhyaline, with a heavy brown pattern, as in the group; a series of seven costal marks, the third at the origin of R_s , the fifth, largest, at the stigma, the sixth and seventh at the ends of veins R_3 and R_4 ; conspicuous brown seams along the cord and outer end of cell *first* M_2 ; a broad seam on the supernumerary crossvein in cell M ; a cloud at the fork of M_{1+2} ; marginal clouds on all the longitudinal veins caudad of R_{4+5} , becoming larger posteriorly, that at the second

anal vein large, subcircular; that of the first anal vein very small; veins yellow, brown in the infuscated areas. Venation: Supernumerary crossvein in cell *M* lying just beyond the level of the end of vein *second A*, so the marks are not in alignment.

Abdominal tergites dark brownish black, the bases of the segments broadly paler. Male hypopygium with the outer dististyle (fig. 6) relatively short and broad, the outer margin at near two-thirds the length with a small triangular flattened wing that is microscopically toothed; the end of the style terminates in a slender chitinized point; before this point, on the outer margin with numerous subappressed spines; inner or lower margin of the style in the angle of the apical spine microscopically denticulate.

Habitat.—Alberta, Montana. *Holotype*, male, Glacier Park Station, Montana, altitude 4,800 feet, July 24 (J. M. Aldrich). *Allotype*, female, Banff, Alberta, July 7, 1922 (C. B. Garrett). *Paratypes*, two males with allotype, July 28–30, 1922. Allotype in the Canadian National Collection.

Type.—Male, Cat. No. 40325, U.S.N.M.

This interesting *Limnophila* is named in honor of Dr. J. M. Aldrich, to whom I am greatly indebted for very many kindnesses in the past.

LIMNOPHILA (PHYLIDOREA) COLUMBIANA, new species

Male.—Length about 9 mm.; wing, 9.5 mm.

Closely allied to *L. (P.) adusta* Osten Sacken, differing especially in the coloration and structure of the male hypopygium.

Rostrum and palpi dark brown. Antennae with the basal segment dark brown, the succeeding three segments obscure brownish yellow, the remainder of the flagellum passing into brown. Head dark, grayish pruinose.

Pronotum and mesonotum dark brown, the sides of the sclerites paler, the surface with a sparse pollen; scutellum and postnotum paler with a narrow dark brown median line. Pleura brown, with a distinct microscopic pruinosity. Halteres pale, the knobs dark brown. Legs with the coxae pale brown, sparsely pollinose; trochanters obscure yellow; femora obscure yellow, the tips rather narrowly and vaguely infuscated; tibiae obscure yellow, the tips vaguely darkened; tarsi pale brown, the tips of the individual segments narrowly darker; terminal segment uniformly dark. Wings subhyaline, the costal region slightly more yellowish; stigma oval, dark brown; cord narrowly and very indistinctly seamed with darker; wing apex not darkened; veins dark brown. Venation: *Sc*₁ ending shortly before the fork of *Rs*, *Sc*₂ much longer, ending just beyond this fork; *Rs* angulated and short spurred at origin;

cell M_1 longer than its petiole. The right wing of the type shows an adventitious cross vein in the axil of R_s .

Abdominal tergites dark brown, the sternites somewhat paler; hypopygium with the basistyles dark brown, the dististyles yellow. Male hypopygium of the general type of *L. adusta*. Outer dististyles appearing as flattened blades, the outer apical angle of each being further produced into a long, gently curved, finger-like point that lies along the longitudinal axis of the style. Inner dististyle broad based, the distal two-thirds strongly narrowed, thence reduced in diameter to the tip, without a conspicuous shoulder on the outer margin near midlength, as in *adusta*. Aedeagus and the subtending gonapophyses very long and slender, as in the group.

Habitat.—British Columbia.

Holotype.—Male, Prince Rupert, June 17, 1919 (H. G. Dyar).

Type.—Male, Cat. No. 40326, U. S. N. M.

LIMNOPHILA (PHYLIDOREA) MICROPHALLUS, new species

General coloration shiny ferruginous, the abdomen of the male without a dark subterminal ring; femora almost uniformly yellow, the tips very vaguely darkened; male hypopygium with the aedeagus and subtending apophyses small and slender.

Male.—Length about 8 mm.; wing, 9.5 mm.

Rostrum and palpi brown. Antennae with the basal segment dark brown, the second segment brownish yellow; basal segments of the flagellum yellow, the terminal segments slightly more infuscated. Head dark, presumably gray pruinose in fresh specimens.

Thorax shiny ferruginous, without markings, the surface very sparsely pruinose. Halteres pale, the knobs slightly infuscated. Legs with the coxae and trochanters reddish ferruginous; remainder of legs yellow, the tips of the femora and tibiae very insensibly darkened; terminal tarsal segments dark brown. Wings with a yellowish tinge, the stigma elongate oval, dark brown; distal three-fourths of cell C infused; wing apex distinctly darkened; narrow and ill-defined seams along the cord and vein Cu_1 ; veins brown, paler in the costal region. Venation: Cell M_1 about equal to its petiole; cell *first* M_2 elongate.

Abdomen yellowish ferruginous, without darker markings. Male hypopygium of the same general structure as *L. fumidicosta* Alexander. Outer dististyle broadly flattened, the apical portion suddenly narrowed and blackened, the tip weakly bifid. Inner dististyle with the curved apical portion short. Bifid gonapophyses with the lateral spine long and slender, acute, the axial spine a little longer but slender, the blackened tip acutely pointed. Aedeagus and subtend-

ing apophyses relatively short and very slender, the former a little the longer.

Habitat.—Montana.

Holotype.—Male, Big Timber, July 14, 1917 (H. G. Dyar).

Type.—Male, Cat. No. 40327, U.S.N.M.

LIMNOPHILA NIGROFEMORATA, new species

Male.—Length about 10.5 mm.; wing, 10.8 mm.

Closely allied to *L. mcdunnoughi* Alexander (Alberta), differing as follows:

Tuberculate pits appearing as barely evident linear impressions at the cephalic margin of the praescutum, one each on the inner margin of the two intermediate praescutal stripes. Dorso-pleural membrane brown, buffy surrounding the spiracles. Legs with the coxae scarcely paler apically; fore femora black, with about the basal fourth yellow; middle femora black, with approximately the basal third yellow; posterior femora as in *mcdunnoughi*; fore and middle tibiae almost black, the posterior tibiae paler. Wings with *Rs* angulated and spurred at origin.

Abdominal tergites dark brown, variegated with obscure yellow immediately beyond the dark basal ring and transverse impressions of each segment; a blackish subterminal ring; hypopygium brownish yellow. Male hypopygium with the basistyle (fig. 7) relatively stout, the dorsal lobe short and broad, with conspicuous setiferous tubercles. Outer dististyle flattened but not as broadly so as in *mcdunnoughi*, the distal half narrowed into a blackened apex that terminates in two conspicuous teeth, the subapical one shorter and straighter; surface of style with abundant microscopic setae. Inner dististyle a very small, stout fleshy lobe. Gonapophyses and aedeagus relatively small and inconspicuous.

Habitat.—Montana. *Holotype*, male, Summit Station, altitude 5,200 feet, July 25 (J. M. Aldrich).

Type.—Male, Cat. No. 40328, U.S.N.M.

In *L. mcdunnoughi*, the gray of the mesonotum is duller and darker. The fore femur has the darkened apex of about the same degree as in the other legs, but when specimens are fully colored there is a distinct darkened ring beyond the midlength of the segment, followed by an ill-defined dull yellow annulus. Abdomen uniformly darkened. Male hypopygium with the outer dististyle even broader than in *nigrofemorata*, greatly flattened; gonapophyses more elongate, much exceeding the aedeagus. *L. mcdunnoughi* is still known only from Alberta (Nordegg, July 14, 1921, Mc Dunning; Banff, July 18–25, 1922, Garrett).

ULOMORPHA ARIDELA, new species

Head dark, pruinose; mesonotum obscure brown with three shiny black stripes; scutal lobes similarly blackened; wings fulvous-yellow, the stigma barely indicated; cell M_1 present; abdominal tergites brown, the sternites obscure yellow.

Female.—Length, 14 mm.; wing, 12 mm.

Rostrum obscure yellow, the palpi dark brown. Antennae very long and slender (for this sex), if bent backward extending to beyond the wing root; basal segments brown, paler ventrally; flagellar segments beyond the second uniform brownish black; flagellar segments cylindrical, becoming very elongate cylindrical on the outer segments, with the limits between segments difficult to determine; all flagellar segments with very long verticils, as in the genus. Head dark, heavily gray pruinose, brighter adjoining the eyes, the anterior vertex and front more yellowish.

Pronotum dark brown, yellow laterally. Mesonotum obscure brown, the praescutum with three shiny black stripes that are virtually confluent, the interspaces being a trifle paler, sparsely pruinose; median stripe more intensely black than the lateral stripes; humeral region more yellowish, including a very small brighter yellow spot behind the pseudosutural foveae; scutum reddish brown, the lobes largely shiny black, the posterior lateral regions obscure yellow; scutellum and postnotal mediotergite black, the latter dulled basally, the extreme lateral margins of the cephalic half yellow; pleura mostly yellow, indistinctly variegated with reddish brown on the anepisternum and sternopleurite, producing ill-defined longitudinal stripes; dorso-pleural region more yellowish. Halteres brown, the extreme base of the stem narrowly yellowish. Legs with the coxae and trochanters brownish yellow; femora brown, the bases yellow, the tips insensibly passing into darker brown; tibiae brown, the tips narrowly darker brown; tarsi dark brown. Wings with a strong fulvous-yellow tinge, the stigma barely evident; veins brown. Macrotrichiae of cells abundant, continued basad beyond the level of the origin of Rs , in cells C , R , M , and *first* A considerably basad of this level; cell Sc devoid of trichiae except at extreme outer end. Venation; Sc_1 , ending shortly before the fork of Rs , Sc_2 at its tip; cell R_3 sessile; R_{1+2} nearly three times R_2 alone; R_{2+3} and R_3 subequal; cell M_1 present, a little more than twice its petiole; cell *first* M_2 large, pentagonal, *m-cu* not far from midlength.

Abdominal tergites brown, with a narrow darker dorso-median line; sternites obscure yellow. Ovipositor with the tergal valves very long and slender, gently upcurved to the acute tips, horn colored, darker basally.

Habitat.—Oregon. *Holotype*, female, Marshfield, June 27 (J. M. Aldrich).

Type.—Female, Cat. No. 40329, U.S.N.M.

Utomorpha aridela is the second species of the genus to be discovered having cell M_1 present. It is readily told from *U. quinquecellula* Alexander by the large size and coloration of the mesonotum.

TRICYPHONA STENOPTERA, new species

Antennae 15-segmented; legs long and slender; wings reduced to long ribbonlike strips.

Male.—Length about 6 mm.; wing, 3.2 mm., its greatest width, 0.2 mm.

Rostrum obscure yellow, the palpi darker. Antennae brownish black throughout, 15 segmented, the second scapal segment large, as long as or longer than the first flagellar segment; flagellar segments beyond the first decreasing in length and diameter outwardly, passing into short oval and then subglobular. Head light gray. Eyes densely hairy.

Pronotum buffy, a little infuscated medially. Mesonotum uniformly pale buffy yellow, without distinct markings. Pleura yellow, the anepisternum and sternopleurite a little more grayish. Halteres pale yellow, the knobs infuscated. Legs unusually long and slender for such extreme stenoptery (fore leg, femur, 5 mm.; tibia, 5.4 mm.; tarsus, 7.9 mm.); coxae long and slender, obscure yellow, sparsely pruinose; femora obscure yellow, the tips vaguely darkened; tibiae light brown, the tips narrowly dark brown; tarsi dark brown. Wings reduced to long, ribbonlike strips, strongly tinged with brownish yellow, clearer yellow basally; veins pale, the macrotrichiae very well preserved. Although the wing is so degenerate, the venation of the radial field is well preserved and shows *Rs* arising at shortly beyond two-thirds the wing length, pale, without macrotrichiae; upper fork of the sector, R_{2+3+4} , bears two long branches, both with conspicuous macrotrichiae for almost their entire length; the basal section of R_2 is not preserved, there being no connection between R_1 and the branches of the sector; R_5 with macrotrichiae for its entire length.

Abdominal tergites light yellowish brown with a vague darker brown dorso-median vitta; sternites more uniformly colored, reddish brown, darker outwardly, the caudal margins of the segments narrowly obscure yellow; subterminal segments uniformly darkened; hypopygium obscure yellow. Male hypopygium (fig. 8) with the tergite (*t*) greatly produced medially into a conspicuous base that divides further into two divergent setiferous arms, the setae on the surface erect, on the ventral surface more spinous and recurved.

Basistyle (*b*) relatively large, the mesal margin with a dense patch of short spines and longer setæ, and a smaller group of very long slender setae. Outer dististyle (*d*) broadly flattened, dilated distally, the outer angle a blunt point, the inner angle produced into a slender fleshy lobe that is set with small black spines, as common in the tribe. Inner dististyle longer and more slender, gently curved, the lower margin with small spinous setae. What appear to be the interbases are broad, flattened curved plates, narrowed distally, terminating in two powerful, unequal spines.

Habitat.—Colorado. *Holotype*, male, Tennessee Pass, July 23, 1917 (J. M. Aldrich).

Type.—Male, Cat. No. 40330, U.S.N.M.

EXPLANATION OF PLATE

(SYMBOLS: The venation used is the Comstock-Needham system, with the cubital field as modified by Tillyard and the radial field as modified by Alexander.—*A*=Anal veins; *C*=Costa; *Cu*=Cubitus; *M*=Media; *R*=Radius; *Sc*=Subcosta.

The terminology of the hypopygium is that of Cramton (1923).—*a*=aedeagus; *b*=basistyle; *d*=dististyle; *g*=gonapophysis; *t*=9th tergite.)

FIG. 1. *Brithura nymphica*; wing.

2. *Eriocera grahami*; wing.

3. *Eriocera arrogans*; wing.

4. *Limonia nitidiuscula*; male hypopygium.

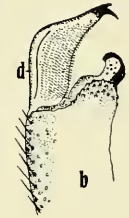
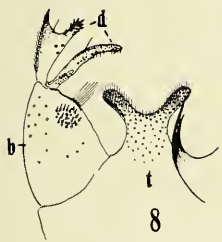
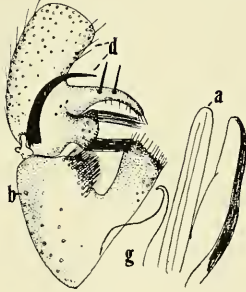
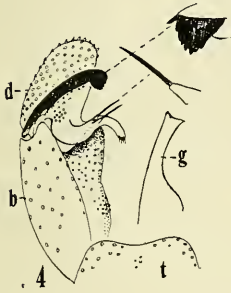
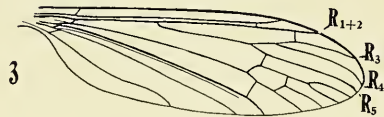
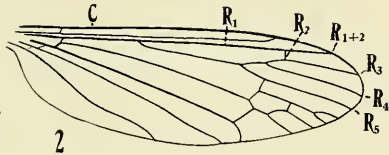
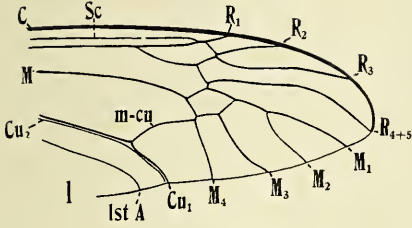
5. *Dicranomyia penicillata*; male hypopygium.

6. *Limnophila (Ephelia) aldrichi*; outer dististyle.

7. *Limnophila nigrofemorata*; styli.

8. *Tricyphona stenoptera*; male hypopygium.





WINGS AND OTHER PARTS OF CRANE FLIES

FOR EXPLANATION OF PLATE SEE PAGE 17

