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## UNDESCRIBED SPECIES OF NEARCTIC TIPULIDAE (DIPTERA). I.

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In the present report I am discussing various novelties from Maine, Florida, Arizona and California, collected by Dr. A. E. Brower, Dr. S. W. Frost, Mr. Carl W. Kirkwood, Professor George F. Knowlton and Dr. L. W. Saylor, respectively. The types of the species are retained in my personal collection through the generosity of the collectors.

### *Prionocera broweriana* n. sp.

Belongs to the *turcica* group; general coloration brownish gray; frontal prolongation of head brownish gray, yellowed ventrally; mesonotal praescutum with four entire dark brown stripes; antenna with proximal segments yellow, flagellar segments moderately serrate, the terminal one very slender; femora obscure yellow, tips narrowly infuscated; wings light brown, prearcular and costal fields more brownish yellow, vein  $R_3$  long and straight; abdominal tergites light brown with a broad nearly continuous middorsal stripe; male hypopygium with dorsal tergal lobes broad, tips obtuse, lateral angles not developed; outer dististyle narrowed outwardly, inner style with apex obtuse, without setae.

*Male*.— Length about 11 mm.; wing 11 mm.; antenna about 3.6 mm.

Frontal prolongation of head short, brownish gray above, the apex and ventral third obscure yellow; nasus short and stout; palpi brownish black, outer two segments more intensely so. Antennae with scape obscure yellow, pedicel and proximal two-thirds of first flagellar segments only moderately serrate, as in the group; terminal segment very slender, about one-fourth as long as the penultimate. Head brownish gray, above with a central darker line, more expanded and evident on the low vertical tubercle, narrowed behind; orbits and antennal fossae obscure yellow.

Pronotal scutum brownish gray, posterior border on either side narrowly yellowed; scutellum light yellow. Mesonotal praescutum brownish gray, with four entire dark brown stripes, the intermediate

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1. Amherst, Massachusetts

pair broad in front, narrowed posteriorly, separated by a more brownish gray central stripe, sublateral stripes obtuse in front; lateral borders darkened, humeral region light yellow; scutum gray, each lobe with two brown areas, the posterior one large, median area with a narrow blackened line; scutellum brownish gray with a blackened central line that is obsolete behind, parascutella light yellow; medio-tergite gray, lateral border light yellow, pleurotergite gray, the elevated dorsal part of the katapleurotergite light yellow, silvery pruinose. Pleura gray, restrictedly variegated with yellow on propleura, dorsal sternopleurite, pteropleurite and metapleura. Body only moderately hairy, as compared with *setosa* and other species. Halteres with stem light brown, base of knob a little darker, apex yellowish brown, glabrous. Legs with coxae brownish gray; trochanters yellow; femora obscure yellow, tips narrowly infuscated, least evident on fore legs; tibiae brownish yellow, tips darkened; proximal end of basitarsus light brown, remainder of tarsi black; claws simple. Wings light brown, prearcular and costal fields, with the stigma, more brownish yellow; obliterative area before stigma and cord whitened, relatively conspicuous; veins brown, more brownish yellow in the brightened fields; veins behind *R* without macrotrichia. Venation: *Rs* slightly less than three times *m-cu*; *R*<sub>1</sub> long and straight, not arcuated as in *dimidiata*, *electa* and others; petiole of cell *M* longer than *m*.

Abdominal tergites sublaterally light brown, the middorsal region with a broad nearly continuous blackened stripe, lateral borders gray pruinose; basal sternites light gray, intermediate ones obscure yellow. Male hypopygium with dorsal tergal lobes broad, narrowed to obtuse tips, the intervening area broader than either lobe; ventral lobes very small, widely separated; lateral tergal angles not produced, as is the case in most species. Outer dististyle dilated at base, conspicuously narrowed to the obtuse tip; inner dististyle relatively narrow, the basal lobe inconspicuous; outer half narrowed, beak obtuse, glabrous; setae of dorsal crest pale, inconspicuous; no tubercles or spines on outer half of style as in *rostellata* and others. The shape of the inner style is more as in *turcica* than in other European members of the group, the broad apex of the beak with abundant pale punctures that do not bear setae.

*Habitat*.— Maine (Penobscot County).

*Holotype*, ♂, Passadumkeag, in bog, May 26, 1944 (A. E. Brower).

I am pleased to dedicate this species to Dr. Auburn Edmond Brower, outstanding student of the Lepidoptera, especially the genus *Catocala*. I am very deeply indebted to Dr. Brower for great series of crane-flies from Maine that have added vastly to the state list. The fly is quite distinct from other regional species, such as *Prionocera dimidiata* (Loew), *P. electa* Alexander, and *P. sordida* (Loew), in the structure of the male hypopygium, particularly the tergite, which likewise differs from that of all other Holarctic species. An outstand-

ing paper by Tjeder<sup>2</sup> records ten species of *Prionocera* from Sweden, including four in the *turcica* group, all quite distinct from the present fly. The only other record for the genus in New England is an imperfectly known specimen from Massachusetts that tentatively was referred to *Prionocera sordida* but which may prove to be conspecific with the present fly. Until further material can be examined the strict identity of this specimen must be held in question. The widespread *illustris* Doane (*fuscipennis* Loew, preoccupied), formerly assigned to *Prionocera*, actually is a species of *Tipula* of the subgenus *Arcotipula* Alexander.

*Tipula (Lunatipula) saylori* n. sp.

Allied to *mariposa*; mesonotum gray, the praescutum with four stripes, the intermediate pair reddish brown; femora and tibiae obscure yellow, the tips narrowly dark brown; wings strongly infuscated, the obliterative band small but very conspicuous, no post-stigmatal brightening; male hypopygium with tergal horns long, cylindrical, simple; apex of basistyle produced into an unequally bispinous appendage, the upper spine smaller, both spines slender and unmodified; inner dististyle with apical head enlarged and produced ventrally, lower beak lacking; lateral arms of gonapophyses more produced.

*Male*.— Length about 15-16 mm.; wing 16-17 mm.; antenna about 5 mm.

*Female*.— Length about 19-21 mm.; wing 18 mm.

Frontal prolongation of head relatively long, light chestnut, restrictedly pruinose at base; nasus long and slender; palpi brownish black. Antennae with scape and pedicel yellow, flagellum brownish black; male with flagellar segments only feebly incised, about equal in length to the longest verticils. Head above grayish brown. Clear gray on front and orbits; a capillary dark brown median vitta and scattered dark setigerous punctures on vertex.

Pronotum gray. Mesonotal praescutum gray with four stripes, the intermediate pair reddish brown. Their mesal edges on cephalic third more darkened, lateral stripes brown; median ground vitta without punctures, at anterior end about one-half as wide as the intermediate stripes; scutum gray, each lobe with two reddish brown areas; scutellum light brownish gray; mediotergite brownish gray. Posterior third yellow, with vague brownish clouds on either side immediately before this. Pleura and pleurotergite brown, heavily gray pruinose; dorsopleural membrane yellow; a conspicuous yellow spot surrounding and beneath the root of halteres. Halteres elongate, stem brown, narrowly yellow at base, knob dark brown. Legs with coxae pale, gray pruinose; trochanters brownish yellow; femora and tibiae obscure yellow, tips narrowly dark brown; tarsi brownish yellow, outwardly passing into black; claws of male toothed. Wings with a strong brown tinge, the prearcular cells more yellowed; cells

<sup>2</sup> Tjeder, Bo. The Swedish *Prionocera* (Dipt. Tipulidae). Opuscula Entomologica, 1948: 75-99, 14 figs.; 1948.

*C* and *Sc* more brownish yellow; stigma pale brown; small brown spots at origin of *Rs* and over *r-m*; oblitative band before cord whitish subhyaline, small but very conspicuous, extending into base of cell *M*<sub>3</sub>; no post-stigmal brightening; veins brown, more brownish yellow in the paler portions. Venation: *Rs* about two and one-half times *m-cu*; *m* about one-half to two-thirds the petiole of cell *M*<sub>1</sub>.

Abdominal tergites yellowish brown or obscure yellow, with a conspicuous more brownish gray median stripe and inconspicuous brown sublateral spots on tergites two to six, lateral tergal borders broadly obscure yellow; setigerous punctures dark, conspicuous, especially in female; sternites obscure yellow, caudal margins restrictedly darker; hypopygium large, chestnut brown. Ovipositor long and slender, cerci tapering gradually to the acute tips; hypovalvae much shorter, compressed, bases blackened. Male hypopygium with ninth tergite produced into long cylindrical horns that narrow gradually to subacute tips, the latter incurved; on ventral surface at base of lobes with a flattened weakly bilobed darkened plate and a small spinous point closer to midline. Ninth sternite with the appendage a low suboval lobe that is clothed with erect long yellow setae. Basistyle at apex produced into a long unequally bispinuous appendage; upper spine smaller, directed dorsad, the second spine directed caudad, both spines slender and unmodified; basistyle cut off from sternite by a suture, the ventral half deep, dorsal portion less complete. Outer dististyle greatly reduced, placed on margin of the larger style. Inner dististyle somewhat as in *mariposa* but differing in details; apical head or beak enlarged and much produced ventrally, lower beak lacking; in *mariposa* the lower beak represented by a acute spine. Gonapophysis with lateral arms more produced than in *mariposa*. Eighth sternite almost as in *mariposa*, the setae arranged in three distinct groups, the enlarged lateral groups decussate.

*Habitat*.— California (San Diego County); Baja California.

*Holotype*, ♂, Campo, San Diego County, California, May 18, 1945 (L. W. Saylor). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, ♂♂ ♀♀, with types; *paratypes*, ♂♀, Baja California, Mexico, one-half mile south of border, near Campo, May 18, 1945 (L. W. Saylor).

The species is named for the collector, Mr. Larry W. Saylor. It is allied to *Tipula* (*Lunatipula*) *mariposa* Alexander and *T. (L.) yosemite* Alexander, especially the former, differing especially in important hypopygial characters, as discussed above. The long slender tergal arms are noteworthy.

*Tipula* (*Lunatipula*) *kirkwoodi* n. sp.

Size large (wing of male 20 mm.); mesonotum buffy gray, the praescutum with a broad light gray central stripe that is bordered laterally by dark brown; legs obscure yellow, tips of femora not darkened, claws toothed; wings brown, conspicuously striped longitudinally with white, including a central line from arculus to wing apex in cell *R*<sub>5</sub>; abdomen light brown, scarcely patterned; male

hypopygium with basistyle produced at apex into a pale triangular blade; outer dististyle generally similar in outline to the blade of basistyle; inner dististyle profoundly bifid, the yellow outer basal lobe slightly larger than the body of style; eighth sternite with dense fringes of yellow setae.

*Male*.— Length about 20 mm.; wing 20 mm.; antenna about 5.5 mm.

Frontal prolongation of head relatively long, obscure yellow, dorsal surface light gray pruinose; nasus long; palpi brown. Antennae with proximal three segments yellow, succeeding segments brown, basal enlargements brownish black, outer segments blackened; segments subequal to the longest verticils, the basal enlargements moderately developed. Head light buffy gray; a capillary brown central line extending from the very low vertical tubercle backward, most evident in front.

Pronotum light buffy gray; setigerous punctures conspicuous. Mesonotal praescutum with a broad light gray central stripe with narrower dark brown margins, lateral praescutal stripes narrow, pale brownish gray; all interspaces with conspicuous brown setigerous punctures, these continued across the suture onto the lateral parts of scutal lobes; posterior sclerites of notum buffy gray, each scutal lobe with two pale brown areas, the inner margin of each slightly darker. Pleura light gray, dorosopleural membrane more yellowed. Halteres with stem brownish yellow, base clear yellow, knob dark brown. Legs with coxae light gray; trochanters yellow; femora and tibiae obscure yellow, tips not darkened, tarsi passing into black; claws of male with a single elongate tooth. Wings brown, striped longitudinally with whitish, including a central line from arculus virtually to apex in cell  $R_3$ , the stripe widest in cells  $R$  and  $M$ ; bases of anal cells and outer third of  $Cu$  similarly whitened; less evident brightenings in cells  $M_1$  and  $M_2$ ; an elongate triangular grayish area in cell  $R_3$ , widened outwardly; prearcular and costal fields more fulvous brown, especially cell  $Sc$ ; veins brown. All outer radial veins with trichia, more sparse on outer medial veins, especially  $M_2$  and  $M_3$ ; vein  $1st A$  with very few trichia scattered over most of the length,  $2nd A$  with abundant trichia on outer two-thirds; conspicuous prearcular trichia on  $R$  and  $M$  and the Anals; squama with setae. Venation:  $R_s$  nearly twice  $m-cu$ ; petiole of cell  $M_1$  about one-half longer than  $m$ ;  $m-cu$  shortly before outer end of  $M_{4+5}$ .

Abdomen light brown, slightly pruinose; posterior borders of tergites narrowly gray; setae short; hypopygium large, yellow. Male hypopygium with tergite transverse, constricted medially, posterior border broadly emarginated; lower surface with a darkened depressed-flattened median lobe, its tip obtuse, and subequal lateral blades with truncated tips. Basistyle extended caudad into a flattened glabrous blade, tip obtusely rounded. Outer dististyle having somewhat the same outline as the blade of basistyle, triangular, narrowed to the blunt tip, surface with long setae, those at apex short. Inner dististyle profoundly divided into the main body and a slightly larg-

er outer basal lobe; body of style narrow, both the beak and lower beak blackened, obtusely rounded; outer basal lobe yellow, vestiture inconspicuous. on inner margin longer and abundant; appendage broadest at near two-thirds the length, lower apical margin shallowly bilobed, apex obtuse. Aedeagus narrow; apophyses not developed. Eighth sternite sheathing, narrowed outwardly, apex truncate, with a broad terminal cushion that is densely fringed with long yellow setae, the lateral ones longest.

*Habitat*.— Arizona (Pima County).

*Holotype*, ♂, Madera Canyon, Santa Rita Mountains, 4800 feet, April 23, 1961 (C. W. Kirkwood). Associated with *Tipula* (*Lunatipula*) *mahavensis* Alexander.

This interesting crane-fly is named in honor of the collector, Mr. Carl W. Kirkwood, student of the Geometridae, who has collected many crane-flies in Arizona and California. In its striped wing pattern the fly is quite distinct from other regional members of the subgenus, superficially resembling *Tipula* (*Bellardina*) *praelauta* Alexander and various species of the subgenus *Yamatotipula* Matsumura.

*Tipula* (*Lunatipula*) *incisa picturata* n. subsp.

*Male*.— Length about 12 mm.; wing 15 mm.; antenna about 3.8 mm.

In its wing pattern most like *Tipula* (*Lunatipula*) *incisa kansensis* Alexander, of eastern Kansas, differing in details, especially the darker, more contrasting markings. Cell *C* more nearly hyaline; more than the proximal half of both cells *R* and *M* more whitened, the darkened areas in outer ends of the cells clearly defined; both the prestigmal and poststigmal whitenings much more distinct. There appear to be some slight differences in the venation, especially in the medial field, but due to the scanty materials of both races still available it seems inadvisable to do more than call attention to this point for future investigations.

*Habitat*.— Arizona (Yavapai County).

*Holotype*, ♂, Peeples Valley, May 11, 1945 (G. F. Knowlton). *Paratopotypes*, 2 ♂♂. The collector writes, "I could have secured 300 or more in the shade of two trees not far from the cafe Peeples Valley. They were very abundant among blue grass and squirreltail grass, in the shade."

*Limnophila* (*Phylidorea*) *frosti* n. sp.

Size medium (wing of female 8 mm.); mesonotal praescutum ferruginous, polished, posterior sclerites of notum pruinose; antennae light brown; front and anterior vertex silvery; legs brownish yellow, outer tarsal segments dark brown; wings strongly tinged with brown, especially cells *C* and *Sc*; longitudinal whitened lines in cells *R*, *M* and *1st A*; no macrotrichia on vein *Sc*; cell *1st M*<sub>2</sub> subrectangular, with *m-cu* before midlength.

*Female*.— Length about 10 mm.; wing 8 mm.

Rostrum chestnut brown; palpi black. Antennae light brown, scape pruinose; flagellar segments oval, becoming smaller and more elongate outwardly, shorter than the verticils. Head in front light silvery; posterior vertex darkened on sides, narrowly gray on central part.

Pronotum highly polished, scutum black, scutellum yellowed. Mesonotal praescutum ferruginous, polished; scutum brown, posterior sclerites obscure yellow, darker medially, conspicuously pruinose. Pleura yellow, slightly pruinose, weakly darkened on anepisternum. Halteres yellow, apex of knob infuscated. Legs with coxae and trochanters yellow; femora, tibiae and basitarsi brownish yellow, outer tarsal segments dark brown. Wings with a strong brownish tinge, especially cells *C* and *Sc*; stigma long-oval, pale brown; a conspicuous longitudinal white line in cell *R* near vein *M*, passing through cell *1st M*<sub>2</sub> to midlength of cell *M*<sub>3</sub>; comparable whitened lines in outer third of cell *M* and two in cell *1st A*; veins brown, more yellowed in the prearcular and costal fields. Macrotrichia on most longitudinal veins beyond cord, lacking on *R*<sub>2+3+4</sub>; basad of cord lacking on *Sc* and *M*; basal section of *Cu*<sub>1</sub> and the Anal veins with apical trichia, very sparse on *1st A*, more numerous on *2nd A*. Venation: *Sc*<sub>2</sub> longer than *Sc*<sub>1</sub>, ending opposite fork of *Rs*; cell *M*<sub>1</sub> approximately one-half as long as its petiole; cell *1st M*<sub>2</sub> subrectangular, with *m-cu* before midlength.

Abdominal tergites yellowish brown, with abundant yellow setae. sternites clearer yellow.

*Habitat*.— Florida (Highlands County).

*Holotype*, ♀, Archbold Biological Station, at light. November 11, 1959 (S. W. Frost).

I name this fly in honor of Dr. Stuart W. Frost who discovered it while engaged in insect-light studies at the Archbold Biological Station. The most similar species is *Limnophila (Phylidorea) osceola* Alexander, of northern Florida, which differs in size, general coloration of the wings, and in the trichiation of the wing veins.

*Limnophila (Phylidorea) paeneadusta* n. sp.

Belongs to the *adusta* group; general coloration of thorax brown, pruinose; flagellum yellow; knobs of halteres dark brown; femora yellow, tips narrowly dark brown; wings whitened, conspicuously patterned with brown; veins beyond cord with macrotrichia; *Rs* relatively long, about twice *m-cu*; abdomen brownish yellow, subterminal segments brownish black; hypopygium with the tergite emarginate, forming oval cushions; basal sternal lobe a narrow blade, the extended tip recurved; both dististyles yellow, terminating in slender fingerlike lobes; aedeagus with three long slender filaments; gonapophyses simple, tips acute.

*Male*.— Length about 9.5 mm.; wing 9.5 mm.; antenna about 1.9 mm.

Rostrum stout, dark brown, gray pruinose; palpi light brown. Antennae with scape brownish yellow, remainder of organ light yellow, the two outer segments slightly darker; basal flagellar segments long-oval, the outer ones elongate, with long verticils. Head gray; anterior vertex broad, about four times the diameter of scape.

Pronotal scutum medium brown, sides yellowed, scutellum chiefly yellow. Mesonotal praescutum opaque brown, gray pruinose; a central darker brown stripe, darkest in front, paling to yellow behind; scutal lobes brown, sparsely pruinose; scutellum obscure yellow; mediotergite yellow, central part weakly brownish gray. Pleura brown, gray pruinose, propleura, metapleura and dorsopleural membrane yellowed. Halteres with stem yellow, knob dark brown. Legs with all coxae and trochanters light yellow; femora yellow, tips narrowly dark brown; tibiae brownish yellow, tips more narrowly darkened; tarsi brown. Wings whitened, conspicuously patterned with brown, including cell *C*, stigma, wing tip and a seam over cord, widest on the anterior cord; narrower brown seams at outer end of cell *1st M*<sub>2</sub>; a narrow darkened seam over vein *Cu* to margin; veins brownish yellow, darker where seamed with brown. Longitudinal veins beyond cord with macrotrichia, basad of this lacking on *Sc*, *Rs* and *1st A*, present at tips of *M* and more extensively on *Cu* and *2nd A*. Venation: *Rs* relatively long, about twice *m-cu*; cell *M*<sub>1</sub> longer than its petiole; *m-cu* at near one-third *M*<sub>3+4</sub>.

Abdomen brownish yellow, subterminal segments brownish black to form a ring; styli yellowed. Male hypopygium with the tergite emarginate, appearing as two darkened lobes that are separated by pale membrane. Basistyle stout, with long yellow setae. Dististyles yellow; outer style moderately flattened, the tip suddenly narrowed into a fingerlike extension; inner style on more than basal half stout, bent at a right angle into a straight slender rod. Sternal region at base of phallosome with a narrow blade on either side, its outer end prolonged and narrowed, finally strongly recurved. The comparable structure in *adusta* is a small subtriangular blade. Phallosome with base of aedeagus unusually long, divided into three long slender filaments, as in the group, these filaments nearly twice as long as the outer dististyle; gonapaphysis appearing as a long slender simple rod, narrowed to an acute point.

*Habitat*.— Maine (Penobscot County).

*Holotype*, ♂, Chester, May 29, 1936 (A. E. Brower).

In the pattern of the wings, *Limnophila (Phylidorea) paene-adusta* resembles *L. (P.) adusta* Osten Sacken, differing in the darkened costal cell, the darkened thorax and in details of hypopygial structure, as the basal lobes of the sternum, as described above.