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**UNDESCRIBED SPECIES OF TIPULA FROM WEST-
ERN NORTH AMERICA (DIPTERA,
TIPULIDAE). PART II.**

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The preceding part under this general title was published in 1945 (Bull. Brooklyn Ent. Soc., XL: 33/37). At this time I am considering three further species of the genus *Tipula*, all from the desert section of western Arizona and southern California where they were collected by my friends, Messrs. George F. Knowlton and John L. Sperry, to whom I am very much indebted for many appreciated favors. The types are preserved in my personal collection of these flies.

***Tipula* (*Lunatipula*) *boregoensis*, n. sp.**

Size very small (wing, male, 8 mm.); mesonotal praescutum gray, with four entire brown stripes, the intermediate pair separated by a broad gray line; antennae with scape and pedicel yellow, flagellum black; flagellar segments simple, without basal swellings; femora and tibiae yellow, the tips narrowly blackened; claws very weakly toothed; wings with a weak brownish tinge, stigma brown; a very conspicuous obliterative band before cord, virtually crossing the wing along vein M_4 ; male hypopygium having the posterior border of tergite very shallowly emarginate; outer dististyle widely dilated on outer part; inner dististyle with beak long-extended, the lower beak lacking; a conspicuous blackened tooth on posterior portion of crest; outer basal lobe narrowly attached to body of style, appearing as a long narrow pale blade, its apex pointed and nearly glabrous; eighth sternite narrowed outwardly, the tip truncate, provided with two groups of relatively few long yellow setae, without lateral lobes or projections.

Male.—Length about 7 mm.; wing 8 mm.

Frontal prolongation of head shorter than the remainder, gray above, obscure yellow on sides and beneath; nasus stout; palpi brownish black, the tip of the third segment narrowly paler. Antennae with scape and pedicel light yellow; basal two flagellar segments black, simple; remainder of organ broken but evidently short. Head light gray, still paler on front; vertex with a very slightly darker median line that is more expanded before midlength.

* Contribution from the Entomological Laboratory, Massachusetts State College.

Pronotal scutum gray, vaguely patterned with brown, scutellum yellow. Mesonotal praescutum gray with four entire brown stripes that are relatively inconspicuous, especially the lateral pair; intermediate stripes separated by a broad gray line that is only a little narrower than the stripe; humeral region restrictedly yellow; remainder of mesonotum gray, each scutal lobe with two brown marks; parascutella yellow; pleurotergite chiefly light yellow. Pleura light gray, the ventral sternopleurite showing a darker color beneath the pruinosity; dorsopleural region yellow. Halteres with stem obscure yellow, knob infuscated. Legs with the coxae light gray; trochanters yellow; femora and tibiae yellow, the tips narrowly but conspicuously blackened, the amount subequal on all legs; tarsi obscure yellow, passing into black; claws very weakly toothed. Wings with a weak brownish tinge, slightly darker beyond the cord; stigma brown; small dark spots at end of *Sc* and over the anterior cord; a very conspicuous whitish obliterative band before cord, virtually crossing the wing along vein M_4 ; poststigmatal brightening much more restricted and inconspicuous, occupying cells Sc_2 and R_2 ; veins brown, paler in the areas basad of cord, especially in the prearcular and costal fields., Squamal setae conspicuous; numerous macrotrichia on most veins beyond cord. Venation: *Rs* more than twice as long as *m-cu*; R_{1+2} entire, its distal third without trichia; *m* and petiole of cell M_1 subequal; *m-cu* on M_{3+4} shortly before fork; basal section of M_{3+4} subequal in length to *r-m*; cell 2nd *A* relatively narrow.

Abdominal tergites obscure yellow, more or less distinctly trivittate with dark brown, most evident on the outer segments, the lateral series broken into spots; central stripe more nearly continuous, interrupted by the yellow posterior borders of the segments; sternites more brownish yellow; hypopygium chiefly yellow. Male hypopygium with the ninth tergite with the posterior border very shallowly emarginate, the lateral lobes thus formed very broad; at base of notch with a microscopic lobule; ventral face of lobes with an obtuse blackened tooth directed mesad. Ninth sternite with its appendage small and inconspicuous, subcylindrical, the basal portion more dilated on the inner face, the whole appendage with numerous setae, those of the expanded portion longer and more conspicuous. Basistyle entire, its dorsal end much narrowed to pointed; caudal margin opposite the point of insertion of the dististyles

with a very small sclerotized point. Outer dististyle with its outer portion broadly expanded. Inner dististyle distinctive; beak long-extended, the lower beak lacking; dorsal crest microscopically toothed, separated from a more blackened posterior lobe or crest by a U-shaped notch; the entire face of style unusually glabrous, with small and inconspicuous setae; outer basal lobe attached to body of style only by a narrow basal connection, appearing as a long narrow pale blade, its apex pointed and more nearly glabrous. Eighth sternite moderately sheathing, narrowed outwardly, the apex truncate, provided with a triangular group of about 18 to 20 long yellow setae on either side of the midline; no lateral lobes or other modifications; setae directed caudad, not or scarcely decussate.

Habitat: California.

Holotype: ♂, Borego Desert State Park, California Painted Desert, San Diego Co., altitude about 450 feet, April 23, 1944 (*J. L. Sperry*).

This very distinct fly has no very close relatives known to me. The unusually simple eighth sternite of the male, with no lateral lobes, somewhat suggests species that are allied to *Tipula* (*Lunatipula*) *usitata* Doane, which are entirely distinct flies. The species more resembles *T. (L.) buenoi* Alexander and allies which have the lateral lobes of the eighth sternite well developed.

***Tipula* (*Lunatipula*) *mohavensis*, n. sp.**

Allied to *buenoi*; general coloration light testaceous brown, more or less pruinose; pleura patterned with brown and yellow; antennae with basal three segments yellow, flagellum black; wings with a strong brownish gray tinge, the prearcular and coastal regions even darker brownish yellow; stigma pale brown, small; obliterative areas very reduced; veins delicate; male hypopygium with the tergite large, its caudal border produced into four blackened points, the outer pair appearing as spines, the shorter inner pair more obtuse; outer dististyle conspicuously expanded at apex; inner dististyle with the beak massive, heavily blackened; dorsal crest produced backward into a conspicuous blade; outer basal lobe a large flattened plate with all margins obtuse; eighth sternite with the lateral and median lobes detached from the body of the sclerite by pale membrane; lateral lobes two-armed, the outer one a glabrous sclerotized horn, the inner arm with several strong setae on its basal part; median lobe transverse, with two large groups of long crinkly setae.

Male.—Length about 15 mm.; wing 15.5 mm.; antenna about 4.7 mm.

Frontal prolongation of head obscure orange yellow; nasus distinct; palpi light brown or brownish yellow. Antennae with scape, pedicel and most of first flagellar segment yellow, the outer end of the latter more darkened; remainder of flagellum black, the segments moderately incised. Head obscure yellow, discolored; vertical tubercle very low to scarcely evident.

Pronotal scutum brown, more or less darkened medially; scutellum and adjoining regions of praescutum bright yellow. Mesonotum discolored, evidently light testaceous brown, more or less pruinose, the praescutum apparently with stripes. Pleura chiefly brown, pruinose; dorsopleural region and extensive areas on the pleurotergite and posterior pleurites bright yellow, including a very narrow transverse line extending from the propleura to behind the fore coxa. Halteres with stem obscure yellow, knob darkened on basal portion, the apex obscure yellow. Legs with the coxae obscure brownish yellow, gray pruinose; trochanters yellow; remainder of legs broken. Wings with a strong brownish gray tinge, the prearcular and costal regions even darker brownish yellow; stigma pale brown, small; obliterative areas very reduced, only the prestigmal one present, extending from before the stigma along the cord, barely entering cell M_3 ; veins light brown, more yellowish brown in the saturated portions. Squamal setae strong and conspicuous; trichia of veins beyond cord numerous and well distributed, lacking on distal third of R_{1+2} ; veins more delicate than in *buenoi*. Venation: R_s about twice $m-cu$; R_{1+2} entire; petiole of cell M_1 nearly twice m ; $m-cu$ on M_4 immediately beyond origin.

Abdominal tergites chiefly fulvous yellow, the posterior margins narrowly, the lateral borders more broadly grayish yellow; sternites and hypopygium yellow. Male hypopygium with the ninth tergite large, its caudal border produced into four blackened points, the outermost pair appearing as strong blackened spines, the inner pair as somewhat shorter blackened knobs, the various points spaced about equidistantly from one another; a conspicuous dorsal furrow. Ninth sternite with its appendage small and inconspicuous, provided with long pale setae. From the notch of the sternite, visible in profile, juts a small sclerotized structure that terminates in two divergent spinous points. Basistyle entire, its dorsal portion produced

into a slender arm; caudal margin unmodified. Outer dististyle expanded at apex into a flattened oblique head. Inner dististyle with its beak massive, heavily blackened; lower beak much smaller, likewise heavily blackened; dorsal crest produced caudad into a conspicuous blade; outer basal lobe a large flattened plate, in the type slide bent backward over the body of the style and its exact outlines difficult to delimit but the margins evidently all obtuse; basal portion of lobe with an extensive group of long yellow setae; sensory area long-oval, including about ten facets. Phallosome consisting of two united plates, each with a strong recurved reddish spine and a longer, more nearly straight outer blade. Eighth sternite with three isolated lobes, detached from the main body of the sclerite by pale membrane; lateral lobes two-armed, the outer arm a glabrous sclerotized horn, the inner one with several strong setae on its basal portion; median lobe pale, its cephalic margin transverse and more thickened, on either side with large groups of setae that bend toward the midline but are scarcely decussate, these setae conspicuously fimbriate and tangled at their tips.

Habitat: Arizona.

Holotype: ♂, Kingman, Mohave Co., altitude 3340 ft., May 9, 1945 (*G. F. Knowlton*).

The most similar described species include *Tipula* (*Lunatipula*) *buanoi* Alexander and *T. (L.) stalagmites* Alexander, which differ very evidently in all details of structure of the male hypopygium.

***Tipula* (*Lunatipula*) *macracantha*, n. sp.**

Belongs to the *impudica* group; general coloration of mesonotum gray, including the praescutal stripes, the median stripe with brown borders; antennae with scape and pedicel yellow, flagellum brownish black; flagellar segments strongly incised; legs brown, tarsi blackened; wings rather conspicuously patterned with brownish gray and whitish subhyaline, the latter color including a major prestigmal area that reaches the wing tip in cell R_5 ; abdominal tergites yellow with three dark brown stripes, the lateral pair much broken, virtually restricted to linear dashes near the bases of the intermediate tergites; male hypopygium with the tergal canthi appearing as long triangular blades, the tips acute; median lobe conspicuous, compressed along upper margin; lateral processes appearing as small, very acute spinous points; outer dististyle with apex very expanded,

roughly triangular in outline; inner dististyle with both the beak and lower beak heavily blackened, posterior crest small, outer basal lobe short and stout, its apex truncate; eighth sternite with a small dark-colored lobule in the membrane of the following sternite.

Male.—Length about 15 mm.; wing 13.5 mm.; antenna about 4.8 mm.

Frontal prolongation of head brown, pruinose; nasus very small; palpi brownish black. Antennae (male) moderately long; scape and pedicel yellow, flagellum brownish black; flagellar segments with the basal swellings a trifle more intensely colored than the stems, strongly incised; longest verticils subequal in length to the segments. Head light gray, with a narrow but conspicuous black median vitta extending from the low vertical tubercle onto the occiput.

Pronotal scutum brown, darker on lateral parts; scutellum light yellow. Mesonotal praescutum with the interspaces buffy, the stripes and lateral borders light gray, the latter more yellowed on the humeral region; median stripe with conspicuous brown borders that do not quite reach the suture; lateral stripes narrow, dark brown, only a little wider than the dark margins of the central stripe; scutum gray, each lobe weakly patterned with brown, median area more yellowed; posterior sclerites of notum obscure yellow, gray pruinose, with a continuous dark brown median line. Pleura light brown, gray pruinose, vaguely patterned with brown. Halteres with stem testaceous, yellow at base, knob infuscated, restrictedly more brightened on dorsal edge. Legs with the coxae obscure yellow, sparsely pruinose; trochanters yellow; remainder of legs brown, the tarsi passing into black; claws (male) toothed. Wings rather conspicuously patterned with brownish gray and whitish subhyaline, the latter color including the prearcular field and basal cells; a major prestigmal area, continued to the wing tip in cell R_5 ; poststigmal brightening more restricted; other pale areas in outer end of cell R_3 , most of M_1 , bases of 2nd M_2 , M_3 and M_4 , and as conspicuous borders to both Anal veins, leaving conspicuous marginal darkenings in the centers of the Anal cells; cells C and Sc a trifle more yellowed than the remainder of ground; somewhat darker clouds in cells R_2 and R_3 and again in the outer end of cell M at $m-cu$; veins brown, paler in the prearcular and costal fields. Venation: Rs relatively long, about two and one-half times $m-cu$; R_{1+2} entire; m longer than petiole of cell M_1 .

Abdominal tergites yellow, with three dark brown stripes, the median one more nearly entire, interrupted at the incisures, particularly at the posterior borders of the segments; lateral stripes much interrupted, appearing as a linear spot near the base of tergites three to seven, less evidently on tergite two; lateral tergal borders broadly grayish yellow; sternites yellow, the outer segments more patterned, especially medially on sternites seven and eight; hypopygium yellow. Male hypopygium having the ninth tergite with the canthi unusually elongate, appearing as long-triangular curved blades that narrow to acute points; setae of margin very small and inconspicuous, those of the basal and lateral portions long and stout; median lobe (subtergal process) only a little shorter than the canthi, the dorsal edge compressed-flattened, the lower portion more expanded; lateral processes appearing as small, very acute spinous points. Ninth sternite having the margin provided with coarse setae, those nearest the midline arising from conspicuous basal tubercles; lobe of sternite small, sub-oval, with a smaller lateral lobule or flange, the main body of the lobe provided with coarse yellow setae. Basistyle with its dorsal part narrowed into a slightly sclerotized spinous point, the ventral end also narrowed but more obtuse. Outer dististyle with the outer end very expanded, roughly triangular in outline; setae elongate, restricted to outer half. Inner dististyle with both the beak and lower beak heavily blackened, the latter very stout; posterior crest small, its dorsal margin microscopically toothed; outer basal lobe short and stout, its apex truncated, on the proximal portion with the usual area of delicate appressed setae; sensory area comprised of only about 8 or 9 facets. Eighth sternite with a small dark-colored median lobule in the membrane of the following sternite, this smaller than the corresponding structure in *mitrata*, provided with microscopic scabrous points; central portion of sternite with several rows of long setae, the lateral parts produced into low lobes that are provided with a few still longer bristles.

Habitat: Arizona.

Holotype: ♂, Peach Springs, Mohave Co., altitude 4790 ft., May 8, 1945 (G. F. Knowlton).

The only species of the *impudica* group with which the present fly requires comparison are *Tipula* (*Lunatipula*) *mitrata* Dietz and *T. (L.) utahicola* Alexander, both of which differ conspicuously in the details of structure of the male hypopygium, particularly of the tergite and dististyles.