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THE IMPUDICA GROUP OF THE DIPTEROUS GENUS TIPULA LINNAEUS.

By W. G. DIETZ, M. D.

A sharply defined, natural group of the genus *Tipula* Linnaeus, characterized as follows: Hypopygium of the male—the genital chamber widely open above, (Pl. I, Figs. 1, 2, 3, 4, 5, 6, 6a). The ninth tergite relatively short, the ninth sternite much prolonged beyond the former. The ninth tergite deeply incised in the middle (except *madina*), the sides emarginate, the lateral portion more or less distinctly incurved beneath, (Pl. I, Fig. 6c). The incurved margin generally ends in a sharp spine, (Pl. I, Fig. 6c), visible in some species (*impudica*, *dimidiata*, Pl. I, Figs. 6b, 8) from above. From the lateral inflexed margin extends a thin shelf or lamina, which bears in the middle a process, compressed and sharply pointed, (except *pyramis pellucida*, where it is broader and obtuse), the upper margin of which fits into the median incision of the tergite, (Pl. I, Figs. 6b, 6c, 8, 9). This process I designate as the subtergal process. Ninth sternite ample, more or less deeply emarginate. Pleurites ample, subtruncate or more or less cone-shaped. Pleural suture present, abbreviated (Pl. I, Fig. 1a). The outer apical appendages are small and inconspicuous, narrowly lanceolate, curved cephalad, the apices abut into or lie beneath the lateral emargination of the ninth tergite, Pl. I, Figs. 1, 2, 3, 4, 5, 6, 6a). The inner apical appendages more conspicuous, the posterior portion laminate and subcautinous with the lower apical appendages; the anterior portion is elevated and consists of two more or less distinct, narrow perpendicular blades (Pl. I, Fig. 1a), which are strongly chitinized and the anterior end of the inner blade overlaps the

anterior end of the outer. The lower apical appendages are conspicuous and present the principal aspect of the genital chamber. As stated above, they appear to be sub-continuous with the inner apical appendages and both arise from the inner surface of the ninth pleurites; laminate in form, the basal portion broadly horizontal, the apical part more or less convoluted, generally emarginate within and without, (Pl. I, Figs. 1, 2, 3, 4, 5, 6, 10), having somewhat the shape of a ploughshare. In a few species (*diversa*, *lyrifera*, Pl. I, Figs. 1 and 2), they are narrowly lanceolate and extend conspicuously beyond the ninth sternite.

The eighth sternite is narrowed posteriorly, subtruncate, or emarginate apically and bears a brush of stiff hairs. In two species (*pyramis*, *pellucida*, Pl. I, Figs. 7 and 7a) the apical margin bears a median process, from its upper surface, near the base, projects a long, slender, curved appendage (Pl. I, Fig. 7).

Ovipositor elongated; valves slender, the upper pair slightly curved upwards.

The following characters are common to all the species here enumerated and will not be repeated in the description of new species. Rostrum of moderate length and thickness; nasus short, obtuse (except *mitrata*). Palpi robust, the last joint at most as long as the three preceding joints together. Frontal callosity small. Antennae of moderate length, flagellar joints approximately unicolorous, fuscous, except the basal joint, which is more or less concolorous with the scapal joints; the basal enlargement, bearing the usual whirl of setae, is usually more blackish than the rest of the segment, the setae scarcely as long as the respective segment. Thoracic dorsum with four darker lines or stripes, generally narrow (broad, *pyramis*, *pellucida*), the inner pair of these lines apparently limit the normal median vitta, are wider and curved outwardly in front, becoming attenuated and approximating each other posteriorly; the lateral stripes are scarcely more than one half the length of the thorax, the anterior end being at same distance from the pseudosutural foveae, and are margined with a paler line (except *pyramis*, *pellucida*); the outer edge of the inner lines bears a row of generally very short hairs. Wings approximately unicolorous, antestigmal spot distinct, extending at least into cell 1st M²; except *dimidiata*,

stem of cell M^1 scarcely more than one-third the length of the cell. The setigerous punctures (Trans. Am. Ent. Soc., XLIV, p. 107), are especially marked on veins R, Cu, Cu^1 and A^2 . Halteres pale, knob dark fuscous.

The species are of medium to fairly large size, except *dimidiata*, which is a small fly. As far as known to me, they are all inhabitants of the Pacific slope.

KEY TO THE SPECIES.

1. Eighth sternite of male with a median process; subtergal process short, obtuse and not compressed laterally..... 2
Eighth sternite without such a process. The subtergal process long, compressed, pointed..... 3
2. Process of eighth sternite elongate, pointed..... *pyramis* Doane
The process shorter, rounded..... *pellucida* Doane
3. Lower apical appendages of hypopygium long, lanceolate, conspicuously extending beyond the ninth sternite..... 4
This appendage is broader, ploughshare-shaped; not conspicuously prolonged..... 5
4. Canthi of the median incision of the ninth tergite very acute (Pl. I, Fig. 1),
diversa spec. n.
Canthi obtuse, (Pl. I, Fig. 2)..... *lyrifer* spec. n.
5. The ninth tergite produced in the middle, (Pl. I, Fig. 3)..... *madina* sp. n.
The ninth tergite deeply and distinctly incised in the middle..... 6
6. Pleurites subtruncate, or emarginate above..... 7
Pleurites obtusely pointed above..... *mitrata* spec. n.
7. Incision of ninth tergite broadly U-shaped..... 8
Incision narrow, sub-parallel, or V-shaped..... 9
8. Canthi of the incision acutely pointed, (Pl. I, Fig. 9)..... *sinistra* spec. n.
Canthi obtuse, subangulate, (Pl. I, Fig. 4)..... *spermata* spec. n.
9. Incision deep, narrow, sub-parallel; canthi prominent, acute, (Pl. I, Fig. 5)..... *spaldingi* spec. n.
Incision V-shaped, canthi prominent..... 10
10. Canthi obliquely truncate, slightly emarginate, (Pl. I, Fig. 6b),
impudica Doane
Canthi very acute, (Pl. I, Fig. 8)..... *dimidiata* spec. n.

AUXILIARY KEY TO THE SPECIES.

1. Costal wing-margin fuscous..... *pellucida* Doane
Not as in the alternative..... 2
2. Cell C of Wing concolorous..... 3
Cell C and S. c. yellowish*..... 8
3. Cu. and its branches margined with fuscous..... 4
Not as in the alternative..... 5
4. Thorax grayish; the antestigmal spot extends into cell Cu^1 *diversa* spec. n.
Thorax dark yellow; the antestigmal spot does not extend into cell Cu^1 ,
spermata spec. n.
5. Wings pellucid..... *spaldingi* spec. n.
Wings grayish..... 6
6. Antestigmal spot small, does not extend beyond R. s.; small form,
dimidiata sp. n.
This spot attains cell 1st M^2 7
7. The dorsal abdominal stripe extends uninterruptedly upon the sixth tergite..... *madina* spec. n.
Not as in the alternative..... *mitrata* spec. n.

*Generally Cell C is paler yellow than Cell S. c.; very pale in some species.

8. Cu. and its branches seamed with fuscous.....*sinistra* spec. n.
Not as in the alternative..... 9
9. Thorax and wings more grayish.....*impudica* Doane
Thorax yellowish; wings sub-pellucid, yellowish at the base..... 10
10. Thoracic stripes broader.....*pyramis* Doane
Thoracic stripes narrow.....*lyrifera* spec. n.

Tipula diversa spec. n.

Large, yellowish-gray. Wings gray, a fuscous dot at origin of R. s. and at end of S. c. Veins Cu and Cu² lightly seamed with fuscous. Ninth tergite of male with a narrow and moderately deep incision, its canthi acute. Lower apical appendages long, narrowly lanceolate, divergent and conspicuously extending beyond the ninth sternite.

Male.—Length 19.5 mm.; wing 19 mm.

Head: Rostrum yellow, beset with rather long, black hairs. Three basal joints of palpi sordid yellow, terminal joint dark fuscous. Flagellar joints of the antennae emarginate above the basal enlargement, joints ten and eleven much more attenuate, the last thirteenth joint, very short; pubescens very fine, white. Face yellowish-white, front and occiput yellowish gray with a distinct median, dark line, extending from the tuberosity to the posterior margin; orbicular margin whitish.

Thorax livid. Pronotal scutum margined with white anteriorly, a dark, median line and a dark spot externally. Pronotal scutellum whitish above, darker laterally. Lines of prescutum chocolate-brown, narrow; the inner pair strongly attenuated in their middle third; the median space with an ill-defined, irregular, darker median stripe; the space, exterior to the inner lines and exterior to the pale line surrounding the outer dark lines, is conspicuously studded with setigerous punctures, bearing blackish hairs. Scutum with a smaller, antero-exterior, and an elongate, inner, brown spot each side. Scutel and postnotum with median, darker line, the postnotum with a lateral, darker spot. Pleura yellowish-gray with whitish pruinosity. Wings grayish, more so in the apical portion. Cells C. and S. c. concolorous, scarcely a shade darker than the general color. A fuscous spot at the beginning of R. s. and at the end of S. c. Antestigmal spot well marked, interrupted immediately behind R. s., extends through outer ends of cells R. and M., basal half of cell 1st M², into bases of cells M⁴ and Cu¹. Veins Cu, Cu¹ and Cu² lightly seamed with fuscous. Cells R. and M. more grayish along the center. Stem of cell M¹ scarcely one-sixth the length of the cell. Legs long and slender, yellowish, with a coarse, short, blackish pubescence, femora and tibiae infusate at the apex, the tibiae longer than the metatarsi; tarsi infusate.

Abdomen yellowish-brown, lighter basally, segments three to six narrowly edged with white posteriorly, a dark-brown dorsal and ventral stripe, lateral stripes ill-defined; the whole abdomen hirsute with an ill-defined, whitish sheen. Eight sternite with a brush of long, yellow hair. Hypopygium (Pl. I, Fig. 1), yellowish-brown, darker posteriorly; ninth tergite with a broad, deep, basal impression, and narrow, moderately deep, median incision, its canthi acute, exteriorly to the latter,

the margin is deeply emarginate, the inflexed portion ends in a spine; the subtergal process is long, laterally compressed and very acute. Ninth sternite with deep, U-shaped emargination. Pleurites ample, subtruncate, emarginate, each end of the emargination ends in a claw-shaped, inward bent hook. The lower apical appendages are long, narrowly lanceolate, somewhat twisted and extend considerably beyond the ninth sternite.

Female.—Length 21 mm.; wing 16.5 mm. The dorsal abdominal stripe entire on tergite one, indicated by a median dash anteriorly on segments two to six; lateral margin of tergites conspicuously white and a large, lateral, fuscous dash on each segment; tergites two to seven with a transverse line each side, anteriorly; venter paler; hairs in conspicuous.

Holotype—♂. Vineyard, Utah, June, 1912, (T. Spalding).

Allotype—♀. Silver City, New Mexico, May 24, 1913.

Paratypes—1 ♂. Platt Canyon, Colorado, June 27, 1915. 2 ♂ ♂, Clear Creek, Colorado, June 23, 1914 (Oslar); 3 ♂ ♂ and 2 ♀ ♀, Silver City, New Mexico, May, 1913.

A very distinct species. Its nearest ally is *T. lyrifera*, which it closely resembles in the lower apical appendages, but from which it is distinguished in its general darker coloration, grayish wings, cell C. concolorous and the fuscous spot at the origin of R. s. and at the end of the S. c. vein.

***Tipula lyrifera* spec. n.**

Yellowish. Wings pale. Ninth tergite of hypopygium with deep, narrow incision, its canthi obtuse; lateral lobes with deep, rounded emargination; lower apical appendages elongate-lanceolate, twisted, conspicuously prolonged beyond the ninth sternite.

Male.—Length 17.5 mm.; wing 17 mm.

Head: Rostrum yellow, frontal prolongation beset with short, black hairs; nasus scarcely indicated. Palpi yellowish, light fuscous outwardly. Face and occiput yellowish with whitish pollinosity and darker median line.

Thorax light, grayish-yellow. Pronotal scutum infusate in the middle; scutal pale yellow. Prascutal lines light brown, the inner pair almost obsolete posteriorly; sides of præscutum light brown. Scutum concolorous, an elongate light brown patch along the median line, another, irregular, curved line externally. Scutal and postnotum slightly darker, the former with an obscure, the latter with a distinct, median fuscous line.

Pleura sordid yellowish, with grayish-white bloom. Legs slender, yellowish; hairy vestiture dense, short, blackish. Femora and tibiae lightly infusate at the apex, tibiae conspicuously longer than the metatarsi; tarsi yellowish-fuscous.

Wings pale with a faint, yellowish-gray tint, more grayish towards the apex; costal cells pale yellow; stigma yellowish fuscous. Ante- and post stigmal spots less conspicuous than in *divergens*, extending through basal half of cell 1st M² into cells M⁴ and Cu¹; veins brown, not seamed with fuscous; stem of Cell M¹ about one-third the length of the cell.

Abdomen yellowish with ill-defined, pale fuscous dorsal line, interrupted on the segmental incisions; posterior margin of segments one to four pale; hairy vestiture short, sparse, blackish; venter pale. The eight sternite yellowish-fuscous, with a dense brush of stiff, yellow bristles. Hypopygium (Pl. I, Fig. 2) yellowish-brown, appendages yellowish-white. The ninth tergite with deep, narrow, median incision and a longitudinal furrow; canthi somewhat prominent, obtuse—seen from above—ending in an acute tooth directed ventrad; the subtergal process slender, acute; lateral lobes of the somite deeply emarginate, the inflexed portion without perceivable spine. The ninth sternite with a deep, U-shaped emargination, the lateral margin of which bears a pale-yellow, membranous appendage. Pleurites slightly emarginate above, each end of the emargination sharply acuminate, the anterior sharp point incurved; the evolved portion of the inner lamina of the inner, apical appendage very small and inconspicuous; the lower apical appendage long, lanceolate, twisted, deeply sinuate near its base within and conspicuously extended beyond the ninth sternite; its inner face conspicuously bearded with yellow hair.

Holotype ♂. Vineyard, Utah, June 6, 1912 (T. Spalding).

Closely allied to and congeneric with *divergens*, from which it differs in its somewhat smaller size, paler color of body and wings and absence of fuscous spots at origin of R. s. and end of S. c. vein.

***Tipula madina* spec. n.**

Medium size. Cell C. concolorous. The ninth tergite of the hypopygium produced in the middle with a small central emargination; evolved portion of the inner lamina of the inner apical appendage large, leaf-like; lower apical appendage not protruding beyond the ninth sternite.

Male.—Length 13.5 mm.; wing 14.7 mm.

Head: Rostrum yellow, shining, nasus distinct, obtuse; hairy vestiture blackish, inconspicuous; palpi pale fuscous. Scapal joints of antennæ yellow. Face, front and occiput, pale yellow with whitish bloom, the occiput with impressed, darker line.

Thorax livid. Pronotal scutum yellowish; scutel pale yellowish, sides fuscous. Lines of prascutum light brown, narrow, distinct; interspaces with numerous piliferous punctures, hairs very short, blackish. Scutum with a smaller, rounded, antero-exterior spot and an elongated, larger inner patch each side, light brown. Scutel and postnotum with median, darker line, the postnotum darker on the sides. Pleura gray with whitish pollinosity, the pteropleura and pleuro-dorsal membrane

sordid yellow. Legs slender, yellowish, pilosity very short, brownish; femora slightly, tibiae not, infusate at the apex, the latter distinctly longer than the metatarsi; tarsi infusate. Wings pale-gray, Cell S. c. and base yellowish, Cell C. concolorous. Stigma pale fuscous. Veins C., S. c. and R. yellowish, other veins brown, not seamed with fuscous; the antestigmal spot inconspicuous, ill-defined, extends interruptedly thru base of cell 1st M², into base of cell M⁴; post-stigmal spot distinct.

Abdomen yellow with light brown dorsal vitta, extending uninterruptedly from tergite one to the base of tergite six; a lateral, conspicuous dash on tergites one to eight; lateral margin pale, grayish-yellow. Venter somewhat darker along the median line, more so caudally. The eight sternite broadly truncate with a brush of moderately long bristles; central bristles decussating. Hypopygium (Pl. I, Fig. 3) yellowish brown; the ninth tergite produced mesially and slightly emarginate apically, broadly and deeply grooved, lateral lobes with deep, rounded emargination; the subtergal process acute, almost entirely concealed by the large, evolute portion of the inner apical appendage. The ninth sternite with a broad, U-shaped emargination, the margin pale yellow with a narrow, pale, membranous appendage. Pleurites subtruncate, angles of the truncature acuminate; the inner apical appendages conspicuous, bent dorsad apically, the evolute portion large, leaf-like, almost completely concealing the subtergal process; the lower apical appendages broad, convoluted, yellow-haired within, with a patch of dark brown hairs; caudal portion subdorsad, apex obtusely rounded. Penis guard large, conspicuous.

Holotype—♂. Provo, Utah, June 24, 1912 (T. Spalding).

Paratype—1 ♂.

The formation of the ninth tergite distinguishes this species from the other members of the group.

***Tipula spaldingi* spec. n.**

Moderately large; general coloration yellowish. The ninth tergite deeply incised and narrowly and deeply channeled its whole length; canthi produced, acute. The lower apical appendages obtusely rounded at the apex.

Male.—Length 17 mm.; wing, 16 mm.

Head: Rostrum yellow, some lustre; frontal prolongation sparsely hairy. Palpi brownish-yellow, darker outwardly. Antennae rather slender and somewhat elongate; scapal and first flagellar joints, pale yellow, following joints subcylindrical, light brown, outer joints dark, pubescens white. Face, front and occiput yellowish with a white bloom, a dark fronto-occipital line.

Thorax yellowish-gray, mesonotum more livid. Pronotal scutellum yellowish above. Prascutal lines light brown, narrow and nearly straight, hairs of the interspaces very fine and short; markings of scutum ill-defined, a smaller, rounded, antero-exterior spot and an elongate blotch along the median line; scutellum and postnotum grayish-

pollinose with a faint, median line. Pleura yellowish-gray, pollinose; pleuro-dorsal membrane yellowish. Legs slender, yellow; pilosity coarse, short, blackish and somewhat appressed; femora and tibiae slightly infusate before the apex, the tibiae longer than the metatarsi; tarsi yellowish-brown. Wings subhyaline with a yellowish tinge, cell C. concolorous; costal veins and vein R. yellowish, the other veins brown, delicate; stigma light brown; antestigmal spot distinct, extends thru outer end of cell R. extreme point of Cell M, basal portion of cell 1st M² into base of cell M⁴ and slightly into base of cell Cu¹; post-stigmal spot ill-defined; a whitish streak, not very distinct, in cell A¹.

Abdomen yellow, dark brown dorsal and lateral stripes (very variable in different specimens), lateral margin of tergites yellowish-gray; venter somewhat darker, especially posteriorly. Eight sternite subtruncate with a dense brush of coarse, brownish bristles, longer than the somite. Hypopygium brownish-yellow; ninth tergite deeply grooved in the middle, apical margin deeply and narrowly incised in the middle, canthi prominent, acute, its points slightly depressed, lobes with a deep, rounded emargination, margin of the inflected portion pale yellow; subtergal process compressed, apex bent downward. Ninth sternite with deep, U-shaped emargination, at its lower end, the somite bulges outward in form of an oval appendage; from the upper part of the margin is suspended, a narrow, elongate-triangular, pointed, yellowish, membranous appendage. Pleurites narrowly subtruncate, angles of the truncate cuspidate; evolute part of the inner apical appendages conspicuous; lower apical appendages relatively short, broad basally, rounded at the tip, a small but deep sinuosity on the inner margin near the base, the inner face of the appendages is coarsely hairy.

Holotype—♂. Eureka, Utah, August 1, 1911 (T. Spalding).

Paratypes—1 ♂. Eureka, Utah, June 30, 1911; 6 ♂♂, Provo, Utah, June 24, 1912; 2 ♂♂, Stockton, Utah, June 13, 1913, (T. Spalding).

The paratypes from Stockton have the abdomen distinctly darker and the lateral margin of the ninth tergite not paler. The lower appendages in some specimens are conspicuously curved outwardly and visible beyond the ninth sternite. A very distinct species.

***Tipula sinistra* spec. n.**

Moderate size; general appearance yellowish. Cells C. and S. c. yellowish; Cu and its branches broadly seamed with light fuscous. The ninth tergite deeply and broadly emarginate, its canthi acute.

Male.—Length, 15 mm.; wing 17 mm.

Head yellow; rostrum darker, some luster; hairy vestiture sparse, long. Palpi yellowish-fuscous, darker outwardly. Front and vertex with a dense white bloom, fronta-occipital line impressed, fuscous.

Antennæ slender, moderately long; scapal and first flagellar joints yellow, the other flagellar joints uniformly fuscous, subcylindrical, pubescence very fine, white.

Thorax grayish-livid. Pronotal scutellum but little paler above. Præscutal stripes light brown, narrow, straight, not curved outwardly in front; the præscutum exterior to the inner lines, grayish pollinose. Markings of scutum ill-defined, a small antero-exterior spot, an elongate spot along the lateral margin and a larger, elongate spot near the median line, light brown; scutellum and postnotum brownish-yellow, lateral edge of the latter pale-yellowish. Pleura obscure yellowish with grayish bloom; pleuro-dorsal membrane sordid yellow. Legs brownish-yellow, pilosity coarse, blackish, somewhat appressed; base of femora and coxæ yellow, femora and tibiæ infusate at the apex, the tibiæ longer than the metatarsi; tarsi fuscous outwardly. Wings pale gray, subpellucid; cells C and S. c. yellowish; veins C., S. c. and R. yellowish, the other veins brown, delicate, especially beyond the cord; vein Cu, and its branches, very broadly seamed with pale fuscous; stigma pale fuscous; the antestigmal spot very distinct, it extends broadly through the outer part of cell R, occupies nearly three-fourths of cell 1st M² and the entire widths of basal two-fifths of cell M⁴; cell 1st M² pentagonal; stem of cell M¹ one-third the length of the cell.

Abdomen yellow with a faint, darker, dorsal stripe; tergites three to seven with fuscous, lateral line; pilosity sparse, short; venter darker yellow. Eight sternite reddish-yellow, apex truncate with a brush of stiff, grayish-yellow, decussating bristles. Hypopygium reddish-yellow; ninth tergite broadly and very deeply emarginate, the canthi very acute, the part of the somite adjacent to the outer half of the emargination, appears to be more membranous than usual; lobes with moderately deep, rounded emargination; the inflexed portion ends in an acute spine; subtergal process broad, obtusely pointed. Ninth sternite broadly and deeply emarginate, lateral margin with a pale-yellowish, narrow, membranous appendage. Pleurites emarginate above, angles of the emargination acutely acuminate; inner apical appendages strongly bent dorsad in front, evolute portion conspicuous, large; lower apical appendages rather short, twisted, the apical portion bent outwardly, apex pointed, fuscous within; surface covered with yellow hairs.

Holotype—♂. North-Western Colorado, August 11, 1911, (E. J. Osler).

A distinct species. Its nearest ally appears to be *impudica* Doane, from which it differs in its more slender antennæ, broadly seamed vein Cu and its branches and the difference in construction of the hypopygium.

Tipula spernata spec. n.

Large; general coloration dark yellow. The ninth tergite of the male abdomen with a deep, U-shaped emargination, the canthi nearly

rectangular. Lower apical appendages not prolonged, broad, curved outwardly, the inner angle extended, acute. Vein Cu and its branches seamed with fuscous.

Male.—Length 17 mm.; wing 19 mm.

Head yellow; rostrum beset with rather long, black hairs. Palpi yellowish-fuscous, darker outwardly. Antennæ moderately long, scapal joints yellow, first flagellar joint yellowish-fuscous, remainder fuscous, segments elongate cylindroidal. Vertex dark, sordid yellow with strongly marked impressed, dark fuscous line.

Thorax dark yellow. Anterior margin of the pronotal scutum and a stripe each side grayish-white, within this stripe is narrowly edged with fuscous, while externally to it is a wider, pale fuscous stripe; pronotal scutell pale yellow above, pale fuscous laterally. Prascutal lines not sharply defined, the inner lines sinuous, wider in middle third. Markings of scutum indistinct. Scutell and postnotum grayish-yellow with indistinct median line, the postnotum edged with pale, laterally. Pleura concolorous with a grayish bloom, pleuro-dorsal membrane paler. Legs yellow, pilosity short, blackish, appressed; coxæ paler; femora and tibiæ infuscate at the apex, the latter longer than the metatarsi; tarsi-yellowish fuscous. Wings grayish, darker in apical portion; cell C concolorous, cell S. c. yellow; stigma brown, antestigmal spot conspicuous, extends broadly through the outer end of cell R, basal half of cell 1st M² into basal third of cell M⁴; post stigmal spot obsolete. Veins brown, Cu and its branches broadly seamed with fuscous; cell 1st M² about twice as long as its greatest width, pentagonal.

Abdomen brownish-yellow; a fuscous dorsal stripe on tergites one to four; a lateral stripe interrupted before the posterior margin of the segments, posterior and lateral margins, pale gray. Venter dusky-yellow. Eighth sternite slightly emarginate each side of middle, the inner end of the emarginations edged with fuscous, a brush of yellowish-gray bristles, longer than the sternite, pale at the base, the inner bristles decussating. Hypopygium (Pl. I, Fig. 4) yellowish-brown; the ninth tergite short with a deep, U-shaped emargination, its canthi approximately rectangular, lobes feebly emarginate, sides strongly incurved and ending in an acute spine; the subtergal process broad. Viewed laterally, its lower edge nearly straight, obtusely pointed; the evolute portion of the inner apical appendages inconspicuous; the lower apical appendages broad, curved outwardly, the inner part prolonged and pointed, yellow-haired within. Ninth tergite broadly and deeply emarginate with a narrow, pale, membranous appendage from the edge of the emargination. Pleurites emarginate above, angles of the emargination acutely pointed.

Holotype—♂, South Park, Colorado, June 23, 1916.

Paratype—♂, Clear Creek, Colorado, June 11, 1916, (E. J. Osler).

Similar to *sinistra*, but larger, and from which it differs in the prescutal markings and hypopygial construction, especially the tergite and the inner apical appendages; the antestigmal spot is well-nigh identical in both species.

***Tipula mitrata* spec. n.**

Medium size. Head and thorax gray, abdomen yellow. Incision of hypopygeal tergite moderately deep, subparallel. Pleurites obtusely pointed; the lower apical appendages broad; the inner angle produced.

Male.—Length 14 mm.; wing 14 mm.

Head: Rostrum reddish-brown, hairy vestiture blackish and rather long; nasus long and acute. Palpi fuscous. Antennæ of moderate length, scapal and first joint of flagellum yellow, flagellar joints cylindrical. Face yellowish-white; front and vertex gray with well marked, dark fuscous line.

Thorax gray. Pronotal scutum with median dark line; scutel pale yellow above. Prescutal lines brown, narrow, the inner pair wider in its anterior half, slightly curved outwardly anteriorly; interspaces with numerous setigerous punctures, bearing short, black hairs. Scutum more ashen-gray, a dark spot on the antero-exterior angle and an elongate spot near the median line. Scutel yellowish-gray, shining, with darker, median line. Postnotum dark gray, with median, dark line. Pleural episterna yellowish-gray, epimera dark-gray; pleuro-dorsal membrane sordid yellow, the whole pleura with a grayish-white polinosity. Legs yellow, hairy vestiture short, dense, blackish and appressed; femora conspicuously infusate at the apex, tibiæ not infusate at apex and distinctly longer than the metatarsi; tarsi fuscous. Wings grayish, darker in cells R^2 and R^3 ; cell C concolorous, cell S. c. and stigma pale fuscous, antestigmal spot distinct, extends broadly through outer end of cell R^1 extreme end of cell M^1 basal half of cell 1st M^2 into base of cell M^4 and slightly into cell Cu^1 ; post-stigmal spot distinct. Cell 1st M^2 about twice as long as wide, pentagonal; a large sub-hyaline space in cell M^1 a sub-hyaline streak in cell A^1 ; veins C, S. c. and R. yellow-brown, other veins brown.

Abdomen yellow; tergites four to six with fuscous, dorsal streak, each tergite with a lateral curved, fuscous dash, abbreviated posteriorly; margin of tergum grayish-white; venter with dusky, median stripe. Eight sternite subtruncate, with a rather narrow brush of yellowish-gray, not very stiff, bristles and a pencil of three or four bristles from the lateral angle bend inward; from the upper surface of the somite same distance from its free margin, arises a soft, membranous, narrow, white process, extending to about two-thirds the length of the brush. Hypopygium brown, shining; ninth tergite broadly and deeply channeled in the middle, incision V-shaped, subparallel, moderately deep, lobes with deep, rounded emargination, sides scarcely inflexed, angles of the median incision prominent, acute; subtergal process long, obtusely pointed. Ninth sternite with V-shaped emargination, the adjoining part

of the somite sub-membranous. Pteurites subangulate, obtusely pointed; inner apical appendages small and inconspicuous, the evolved portion scarcely perceptible; lower apical appendages (Pl. I, Fig. 10), broad and flat, the inner apical angle prolonged and beset with short, yellow hairs.

Holotype.—♂. Silver City, New Mexico, May 26, 1913.

In general appearance, this species closely resembles *impudica* but the hypopygeal structure, especially the lower apical appendages, is very different. The peculiar appendage of the eighth sternite must not be confounded with the median process as found in *pellucida* and *pyramis*, where it arises from the edge of the somite and is not membranous.

***Tipula dimidiata* spec. n.**

Small size. Cell C. concolorous; antestigmal spot very faint. Tergite of hypopygium broadly channeled and deeply incised in the middle, the lower apical appendage turned upward apically, fuscous, broadly rounded at the apex.

Male.—Length 10 mm.; wing 11 mm.

Head yellowish-gray. Rostrum dusky-yellow; frontal prolongation with very few hairs; nasus scarcely evident. Palpi light fuscous, darker outwardly. Face whitish; the fronto-occipital line distinct, expanded into a spot on the frontal tubercle.

Thorax yellowish-gray. Pronotal scutum with a white line each side which is continued along the anterior margin, outer part of somite light fuscous; pronotal scutellum whitish above, lateral part fuscous. Prescutal lines dark brown, distinct, the inner pair not sharply defined, nearly straight and a trifle wider anteriorly, the median space mouse-gray. Markings of scutum very indistinct. Scutellum and postnotum dark gray with faint median line. Pleura and pleuro-dorsal membrane yellowish-gray with a faint, whitish pollinosity. Legs slender, yellowish, pubescence very fine; femora and tibiae infusate at the apex, the tibiae much longer than the metatarsi; outer tarsal joints fuscous. Wings grayish, a trifle darker in apical portion; cell C. concolorous, cell S. c. light fuscous; stigma light fuscous, the ante-stigmal spot very indistinct, extending as a narrow, pale streak through cell 1st M² into cell Mi; post-stigmal spot obsolete; cell 1st M² scarcely twice as long as wide, pentagonal; stem of cell M¹ one-fourth the length of the cell. Veins brown, Cu not seamed with fuscous.

Abdomen yellow, dorsal stripe ill-defined, more distinct on tergite five; lateral fuscous stripe well marked, lateral margin of tergum not paler; venter paler. Eighth sternite light brown, apical margin truncate with a narrow brush of yellowish-gray setae. Hypopygium light brown. Ninth tergite (Pl. I, Fig. 8), broadly channeled and deeply incised, canthi prominent, acute, lobes with deep, rounded emargination; the lateral margin ends in an acute spine; subtergal process narrowly-

lanceolate. Ninth sternite deeply and broadly emarginate, margin of the emargination and lower margin of the somite pale yellow. Pleurites subtruncate above; inner apical appendages bent upward anteriorly, the evolute portion small, but distinct; lower apical appendages irregularly scalloped exteriorly in their basal part, the distal part semi-dorsad, tongue-shaped, fuscous.

Holotype—♂. Silver City, New Mexico, June 1, 1911.

At once distinguished by its small size. Superficially it resembles *impudica* and *mitrata*, from both of which it differs in the faint ante-stigmal spot, aside from structural differences of the hypopygium.

Tip. impudica Doane. Type locality, Wawai, Washington. Numerous specimens in my collection from the following localities in Colorado: Clear Creek, July; Chimney Gulch, Golden, June; Four-Mile Creek, September; Bear Creek, Morrison, July; Cardif, June, July; Mancos, August, (E. J. Osler).

Tip. pyramis Doane. Type locality, Pyramid Lake, Nevada. Specimens in my collection from the following localities in Utah: Provo, June; Deer Creek, Provo Canon, August; Eureka, June; Stockton, June; Vineyard, July, August, (T. Spalding).

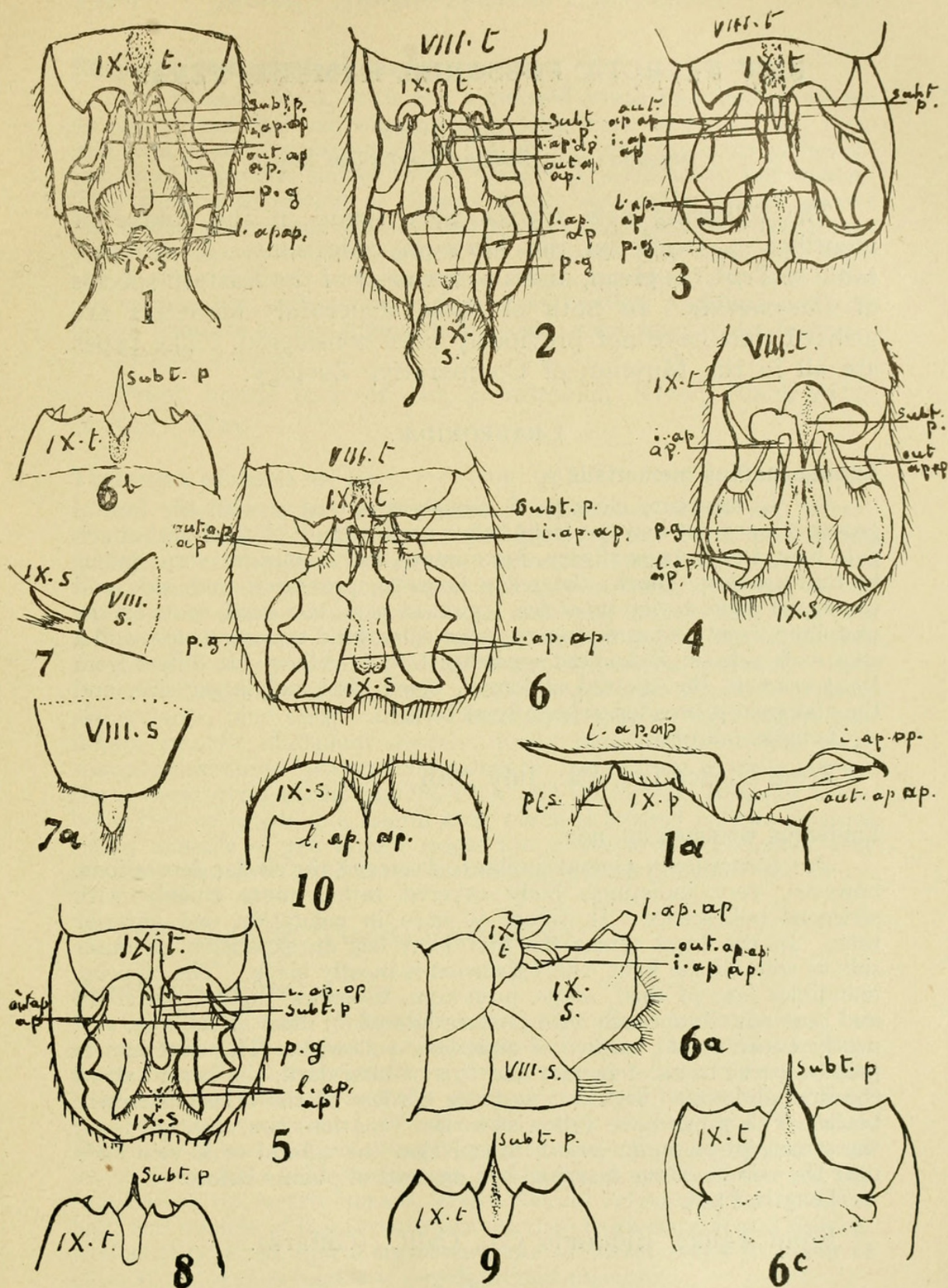
Tip. pellucida Doane. Annals Ent. Soc. of America, Vol. V, p. 61. *Tip. clara* Doane, syn.

EXPLANATION OF PLATE I.

The following abbreviations attached to the Figures signify as follows:

- viii s.—Eighth sternite.
- ix t.—Ninth tergite.
- ix s.—Ninth sternite.
- subt. p.—Sutergal process.
- ix p.—Ninth pleurite.
- pl. s.—Pleural suture.
- I. ap. ap.—Inner apical appendage.
- out. ap. ap.—Outer apical appendage.
- l. ap. ap.—Lower apical appendage.
- p. g.—Penis guard.

1. *Tipula diversa*. Upper view of hypopygium.
- 1a. Lateral view of pleurite, showing appendages and pleural suture.
2. *Tipula lyrifera*. Upper view of hypopygium.
3. *Tipula madina*. Upper view of hypopygium.
4. *Tipula sinistra*. Upper view of hypopygium.
5. *Tipula spaldingi*. Upper view of hypopygium.
6. *Tipula impudica*. Upper view of hypopygium.
- 6a. Lateral view of hypopygium.
- 6b. Ninth tergite from above.
- 6c. Ninth tergite from below.
7. *Tipula pyramis*. Lateral view of eighth sternite.
- 7a. Eighth sternite, seen from below.
8. *Tipula dimidiata*. Dorsal aspect of ninth tergite.
9. *Tipula sinistra*. Upper view of ninth tergite.
10. *Tipula mitrata*. Caudal part of hypopygium showing lower apical appendages, seen from above.





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