



**Records and Descriptions of North American Crane-Flies (Diptera). Part III.  
Tipuloidea of the Upper Gunnison Valley, Colorado**

Charles P. Alexander

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# Records and Descriptions of North American Crane-Flies (Diptera)<sup>1</sup>

## Part III. Tipuloidea of the Upper Gunnison Valley, Colorado

Charles P. Alexander

In the present report are discussed the partial results of extensive collections of Tipuloidea that were taken in the vicinity of Gothic, Gunnison Co., Colorado, in 1934, chiefly by Mrs. Alexander and the writer. It is hoped that we will be able to make a detailed survey of the crane-flies of the entire Rocky Mountain system and the western United States and Canada, a study that will require a vast amount of work during the next several years. In 1941, in Wyoming and Colorado, very extensive series of these flies were taken that will be discussed in future parts under this general title.

### General Account

The so-called "Gothic Area," site of the Rocky Mountain Biological Laboratory, lies in the Gunnison National Forest, Gunnison Co., in west-central Colorado. One of the sources of the Gunnison River, East River, flows through the Gothic Area and much of the collecting done at Gothic was along or near this beautiful mountain stream. East River eventually flows into the Gunnison, which in turn flows via the Grand River into the Colorado and into the Gulf of California. All collecting in the area was thus to the west of the Continental Divide.

The facilities of the Rocky Mountain Biological Laboratory (Dr. John C. Johnson, Director, Crested Butte, Colorado) were made available to us in 1934 and we are greatly indebted to various members of the staff and student body of 1934 for much co-operation in our work. Our thanks are extended to Dr. and Mrs. Johnson, Dr. A. O. Weese, Dr. and Mrs. George W. Hunter III, Dr. and Mrs. B. D. Barclay, Dr. Mary F. Howe (Mrs. M. H. Schott), Dr. J. Teague Self, and, from the student body, Mr. John D. Hallahan. The last-named was keenly interested in insect collecting and we are very greatly

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<sup>1</sup> The preceding part under this general title was published in the *American Midland Naturalist* **26**: 281-319; 1941.

References in the text refer to the bibliography at the conclusion of the general account.

In all cases where no collector is given, the specimens were secured by the author. M. M. Alexander—Mrs. Charles P. Alexander.

indebted to him for many fine specimens. In 1935, our former student, Dr. Inez W. Williams, was an advanced research student at the Laboratory and collected further extensive series of Tipuloidea, these including the only specimens of the primitive family of Tanyderidae ever taken in the area.

The brief account of Gothic prepared for the annual announcement of the Laboratory is so excellent that I am taking the liberty of quoting part of it.

The Gothic Area comprises about a half million acres of virgin territory, almost uninhabited. There are numerous high mountains, rivers and streams, lakes, bogs, swamps, mountain and alpine meadows and regions of perpetual snow. The great range in elevation (8,000 to 14,000 feet) makes for great diversity in fauna and flora and offers examples of many different ecological communities.

In 1930 the U. S. Forest Service set aside the "Gothic Natural Area," in the Gunnison National Forest, a permanent research tract of about 905 acres, not far from the laboratory. Of this area some 500 acres is a virgin spruce-fir forest, while the other 400 acres is composed of alpine meadows, marshland and open grassy parks.

The remarkably rich environment of the Rocky Mountain Biological Laboratory, in conjunction with a splendid staff, makes this area an ideal one for the study of the insect fauna in many groups, still almost unworked.

Mrs. Alexander and I arrived at Gothic on July 1st, 1934 and remained until August 8th. The general altitude of the laboratory and immediate vicinity is 9,500 feet; collections were made up the sides of Gothic Mountain to over 10,000 feet; Mount Avery to above 10,000 feet; along Copper Creek to above Judd Falls; up the Gothic Valley along East River to Emerald Lake, 10,500 feet; and in the Biological Forest, or "Gothic Natural Area," at about 10,000 feet.

One restricted area across East River from our cottage (Bellevue Cottage) was made the base for special study. This occupies a swampy area with considerable growth of Engelmann's Spruce, *Picea Engelmannii* (Parry) Engelmann, and Alpine Fir, *Abies lasiocarpa* (Hooker) Nuttall, together with other characteristic plants of this association, including *Equisetum*, *Saxifraga arguta* Don., *Swertia palustris* A. Nels., *Gentiana elegans* A. Nels., and *Lonicera involucrata* Banks.

The stations in the Upper Gunnison Valley where collections were made lie in the upper Canadian life zone and in the lowest Hudsonian. The slopes of the mountains and the vicinity of Emerald Lake are definitely higher Hudsonian. No collections were made outside of these two zones. Following the classification of the United States into the physical divisions adopted by Fenneman and co-workers (Fenneman, 1931), the Gothic Area falls in the Southern Rocky Mountain Province of the Rocky Mountain System.

In addition to the species recorded at this time, there still remain a considerable number of additional forms that I have not been able to identify satisfactorily to the present moment. Most of these belong to the genus *Tipula*, including a vast range of species in western North America.

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## Systematic Account

## TANYDERIDAE

*Protanyderus vipio* (Osten Sacken, 1877).—Gothic, 9,500 ft., July 6, 1935 (*Inez W. Williams*), swept from vegetation along the East River.

## PTYCHOPTERIDAE

*Ptychoptera pendula* Alexander, 1937.—Not uncommon in the Gothic Area, especially so along a small, clear mountain stream, 10,100 ft., on road to Emerald Lake, July 12, 1934.

## TRICHOCERIDAE

*Diazosma subsinuata* (Alexander, 1916).—Gothic, 10,000 ft., July 5, 1934 (*Hallahan*); 9,500 ft., July 23, 1934 (M. M. A.).

## TIPULIDAE

## TIPULINAE

*Tipula* (*Bellardina*) *gothicana* sp. nov. — General coloration of mesonotum buffy yellow, the praescutum with four brown stripes that are narrowly bordered by darker brown; femora brownish yellow, the tips narrowly blackened, preceded by a very vague, obscure yellow, subterminal ring; wings with the ground color grayish brown, sparsely variegated by darker brown and cream-colored areas; abdominal tergites reddish brown, narrowly darkened on sides; male hypopygium with the median region of tergite produced into a conspicuous depressed-flattened lobe, its caudal margin with an oval notch.

♂. Length, about 17-19 mm.; wing, 17-20 mm.; antenna, about 3.3-3.5 mm.

♀. Length, about 18-19 mm.; wing, 22 mm.

Frontal prolongation of head relatively long, yellowish brown on sides, darker above; nasus long and slender; palpi brown. Antennae (male) of moderate length; scape brownish yellow, pedicel clear light yellow, flagellum

pale brown, the outer segments slightly more darkened; flagellar segments only weakly incised, with very long conspicuous verticils. Head dark brown, the front and orbits more brownish gray.

Pronotum brown, paler laterally. Mesonotal praescutum with the ground color buffy yellow, with four brown stripes that are narrowly and somewhat insensibly bordered with darker brown; intermediate stripes confluent on cephalic third or less, distinctly separated behind, reaching the suture; humeral and antero-lateral portions of praescutum darkened; scutum buffy gray, each lobe with two conspicuous brown areas, the more mesal ones almost touching one another on the median line; scutellum darkened basally, broadly more yellow behind, parascutella dark; mediotergite yellow, the cephalic two-thirds gray pruinose. Pleura and pleurotergite weakly darkened, more or less variegated with paler and darker areas, the latter including the ventral sternopleurite and meron, together with the pleurotergite above the root of halteres. Halteres with stem brownish yellow, knob infuscated, its apex yellow. Legs with coxae grayish brown, the tips pale, the posterior pair somewhat more intensely darkened; trochanters yellow; femora brownish yellow, the tips narrowly blackened, preceded by a very vague, obscure yellow, subterminal ring, the amount of black subequal on all femora; tibiae and basitarsi obscure yellow, the tips dark brown; remainder of tarsi passing into black; tibial spur

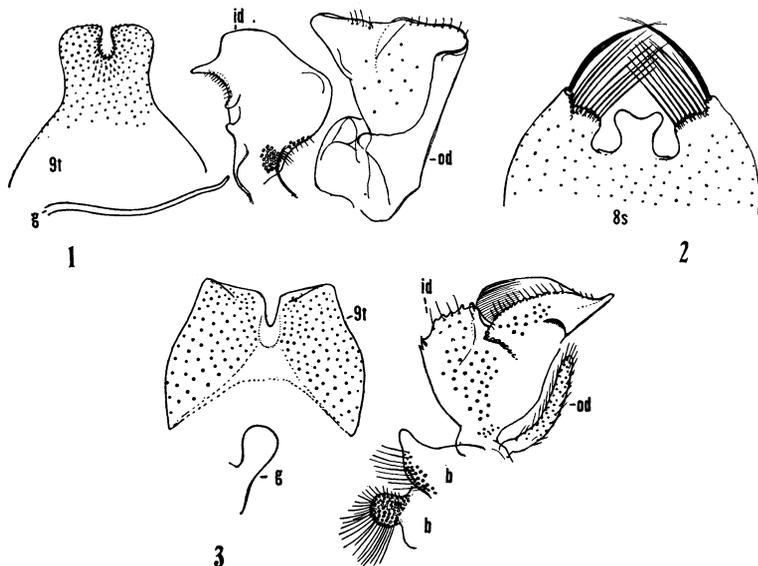


Fig. 1. *Tipula (Bellardina) gothicana* sp. n.; male hypopygium.

Figs. 2, 3. *Tipula (Lunatipula) barbata* Doane; male hypopygium.

(Symbols: b, basistyle; g, gonapophysis; id, inner dististyle; od, outer dististyle; s, sternite; t, tergite.)

formula 1-1-2; claw (male) toothed. Wings with the ground color extensively grayish brown, restrictedly variegated with darker brown and cream-colored areas, the darker markings, besides the stigma, including a very small spot at origin of  $R_s$ , two dark areas in outer half of cell  $M$  and another at near one-third the length of cell  $Cu$ ; creamy areas in radial field beyond the stigma restricted in amount; distal fourth of cell  $R_5$  brightened; other pale marginal spots in medial and cubital fields relatively restricted; veins brown. Numerous macrotrichia on outer radial veins, becoming more sparse on outer medial veins. Venation:  $R_s$  elongate, more than one and one-half times  $m-cu$ ; cell  $R_3$  constricted at midlength; cell  $1st M_2$  short.

Abdominal tergites reddish brown, narrowly darkened on sides; sternites yellow to obscure yellow; outer segments, including hypopygium, more infuscated. Male hypopygium (Fig. 1) relatively large and conspicuous; tergite fused with sternite. Ninth tergite,  $9t$ , with median portion produced caudad into a conspicuous depressed-flattened blade, the posterior margin with a deep but narrow oval notch that is widest at midlength; lateral lobes broadly truncate; tergal blade with numerous setae of moderate length, those adjoining the notch shorter and more spinous. Mesal face of basistyle with a group of long conspicuous setae. Outer dististyle,  $od$ , larger than the inner, of massive, irregular form; inner style,  $id$ , strongly compressed, the beak small and relatively slender. Gonapophyses appearing as long and slender rods.

*Holotype*, ♂, Gothic, 9,500 ft., July 21, 1934 (*J. D. Hallahan*). *Allotopotype*, ♀, July 29, 1934 (*Alexander*). *Paratopotypes*, 4 ♂♂, July 17-19, 1934 (*Alexander & Hallahan*).

*Tipula (Bellardina) gothicana* is closest to *T. (B.) subcinerea* Doane, differing conspicuously from this and all other described species in the structure of the male hypopygium, especially the ninth tergite. Several large and handsome species of *Tipula* in the Rocky Mountain and Pacific Coast regions seem best referred to the subgenus *Bellardina* Edwards, 1931, although they differ in certain respects from the subgenotype of the last. These species include *T. (B.) albimacula* Doane, 1912; *T. (B.) commiscibilis* Doane 1912 (*contaminata* Doane, 1901, preoccupied); *T. (B.) faustina* Alexander, 1941; *T. (B.) pacifica* Doane, 1912; *T. (B.) pura* Alexander, 1941; *T. (B.) ramona* Alexander, 1941; *T. (B.) rupicola* Doane, 1912; and *T. (B.) subcinerea* Doane, 1901, among the described forms. In the Himalayan-Chinese fauna there is an almost equal development of large and showy species that have been placed in a special subgenus *Sinotipula* Alexander, 1935. With the recent accession of many new species in Tropical America it appears doubtful whether the last named group can be maintained as distinct from *Bellardina*.

*Tipula (Yamatotipula) albocaudata* Doane, 1901.—Gothic, 9,500 feet, near the river, July 2, 1934; above Gothic, 10,100 feet, along a small mountain stream, July 12, 1934. One male from Logan Cañon, Utah, May 28, 1938 (*Bischoff*) is considerably darker than the above specimens, especially in the wings, but from the structure of the male hypopygium is the same.

Whether *T. (Y.) cognata* Doane, 1901, will prove to be a synonym of the above is still in question.

*Tipula (Yamatotipula) continentalis* Alexander, 1941.—Gothic, 9,500 ft., July 4, 1934; 10,000 ft., July 12 and August 1, 1934. These specimens show the following range in size: ♂. Length about 12-14 mm.; wing, 13.5-16 mm. ♀. Length, about 16-18 mm.; wing, 15-16 mm.

I have seen other specimens from Three Sisters, Sunshine Shelter, Oregon, 6,000 ft., July 12, 1936 (*R. E. Rieder*); Oregon State College. These latter are even larger than the above, with the wing pattern more conspicuous, but from the structure of the male hypopygium are conspecific.

*Tipula (Oreomyza) sarta* Loew, 1863.—Gothic, 9,500 ft., July 18, 1934 (*Hallahan*); 11,000 ft., July 4, 1934 (*Hallahan*).

*Tipula (Lunatipula) macrolabis* Loew, 1864.—Gothic, 9,500 ft., July 23, 1934 (*M. M. A.*)

*Tipula (Lunatipula) barbata* Doane, 1901.—Originally described from 1 ♂ and 2 ♀♀, labelled only "Col.", collected by H. K. Morrison; type, U.S.N.M. 10,937. The species is now becoming better known and some further notes and figures concerning it are given.

♂. Length, about 10 mm.; wing, 11 mm.; antenna, about 4 mm.

Antennae with scape and pedicel yellow, flagellum uniformly dark brown; flagellar segments very feebly to scarcely incised, the basal swellings inconspicuous; verticils much shorter than the segments.

Mesonotal praescutum brownish gray with two narrow but conspicuous intermediate stripes, the usual lateral pair very poorly indicated; a darkened triangle just inside the humeral region; scutal lobes dark brownish gray, the median region paler; posterior sclerites of notum gray with a continuous capillary, dark brown, median vitta. Femora yellow, the tips somewhat broadly and conspicuously dark brown, the amount subequal on all legs; claws (male) toothed.

Male hypopygium (Figs. 2, 3) with the tergite, *9t*, produced cephalad along the lateral portions, the median length much shorter; caudal border with a deep U-shaped notch, the very broad lateral lobes truncated. Basistyle, *b*, on ventro-caudal portion with a conspicuous subglobular lobe that is provided with long setae, the more ventral ones longest, exceeding twice the diameter of the lobe, the dorsal setae small and delicate. Outer dististyle, *od*, a small pale lobe. Inner dististyle, *id*, a compact structure, the posterior lobe extensive but not well differentiated from the main body of style; dorsal crest pale, membranous, with longitudinally parallel ribs; beak of style short. Gonapophyses, *g*, appearing as darkened subcircular blades. Eighth sternite, *8s*, extensive sheathing, the lateral lobes bearing long conspicuous setae, especially the outer one of either side which rises from the summit of a short tubercle and is distinctly fasciculate, the remaining strong setae totalling about a dozen on either side, in a more or less evident row, their free tips decussate across the

median line; a glabrous median plate projects between the lateral lobes, its caudal border gently emarginate.

Alberta: Edmonton, September 5, 1925 (*Owen Bryant*).

Colorado: Gothic, 9,500 ft., August 2, 1934; Peaceful Valley, August 25 (*Cockerell*); Halfway House, Pikes Peak, September (*Cockerell*).

New Mexico: White Mountains, south fork of Eagle Creek, altitude about 8,000 ft., at light, August 15-18 (*C. H. T. Townsend*).

It seems evident that the species is a late summer and early fall form.

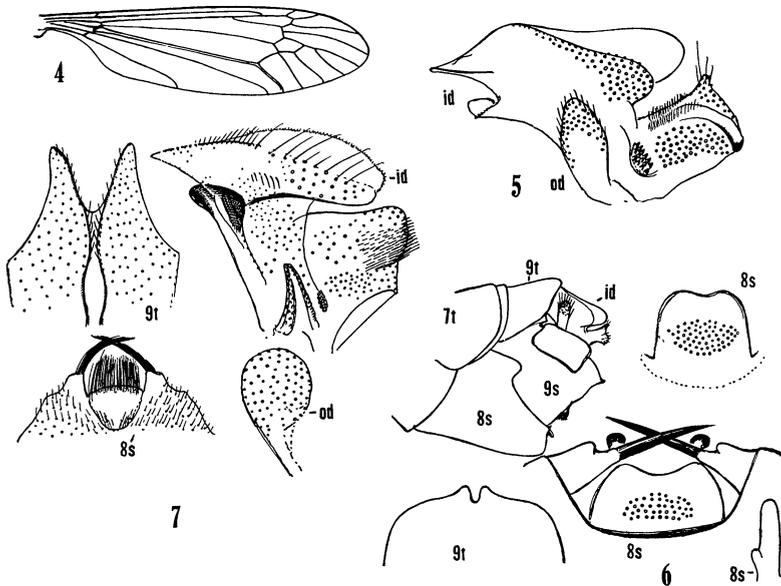


Fig. 4. *Tipula (Lunatipula) rabiosa* sp. n.; venation.

Figs. 5, 6. *Tipula (Lunatipula) rabiosa* sp. n.; male hypopygium.

Fig. 7. *Tipula (Lunatipula) bigeminata* Alexander; male hypopygium.

(Symbols: id, inner dististyle; od, outer dististyle; s, sternite; t, tergite.)

*Tipula (Lunatipula) bigeminata* Alexander, 1915.—Originally described from Nevada. Like the last, the fly is still insufficiently known and supplementary details are given.

Ovipositor with cerci very long and slender, almost straight. Male hypopygium (Fig. 7) with the tergite, *9t*, long and narrow, the lobes conspicuous, subparallel to weakly divergent, separated from one another by a deep U-shaped notch; dorsal face of tergite with a deep groove, the adjoining margins approximated on cephalic portion of sclerite and provided with setae. Outer dististyle, *od*, on outer half expanded into an unusually large, nearly circular spatula. Inner dististyle, *id*, complex, as shown; a conspicuous dorsal crest that becomes very pale and weakly fimbriate along the extreme margin; posterior

lobe of style broad. Basistyle with a strong lobe immediately ventrad of the point of insertion of the dististyles, this lobe blackened, its outer half cylindrical, provided with numerous short but very strong setae; above this lobe a powerful flattened reddish blade, the tip acute. Eighth sternite,  $8s$ , with the fasciculate bristles of lateral lobes decussate across median line; median lobe large and pale, fringed with long pale setae; more anteriorly the dorsal or inner surface, together with the inner faces of the lateral lobes provided with abundant strong curved reddish bristles.

Gothic, 9,500 ft., July 4, 1934; 10,000 ft., July 4-5, 1934; Kebler Pass, Colorado, 10,150 ft., July 15, 1934.

**Tipula (Lunatipula) rabiosa** sp. nov. — General coloration yellow, the praescutal stripes relatively indistinct; flagellar segments uniformly dark brown to brownish black; wings grayish yellow, the prearcular and costal fields light yellow; stigma pale brownish yellow; oblitative areas small and inconspicuous; male hypopygium with the tergal lobes low and obtuse; outer dististyle a short spatula; eighth sternite with a pair of very powerful spines crossing one another at the midline.

♂. Length, about 16-17 mm.; wing, 16-18 mm.; antenna, about 4-4.5 mm.

Frontal prolongation of head obscure yellow; nasus stout; palpi brown, the terminal segment brownish black. Antennae relatively short; scape and pedicel yellow, first flagellar segment light brown; remainder of flagellum dark brown to brownish black; flagellar segments only weakly incised; longest verticils subequal to or a little shorter than the segments. Head buffy yellow, sparsely pruinose; vertical tubercle poorly developed.

Mesonotal praescutum obscure yellow, the three stripes very poorly differentiated, the median one slightly more reddish; posterior sclerites of notum more reddish, with a yellow pollen, the scutal lobes and the scutellum slightly more darkened. Pleura yellow. Halteres with stem yellow, knob darkened, the apex slightly paler. Legs with coxae and trochanters obscure yellow; femora yellow, the tips narrowly dark brown, the amount subequal on all legs; tibiae and basitarsi obscure yellow, the latter darkened at tips; remainder of tarsi brownish black; claws (male) with a single strong tooth. Wings (Fig. 4) grayish yellow, the prearcular and costal fields, especially cell  $Sc$ , conspicuously light yellow; stigma pale brownish yellow; oblitative areas across cord very small and inconspicuous. Venation:  $R_{1+2}$  preserved;  $m-cu$  fully two-thirds the length of  $R_s$ .

Abdominal tergites yellow, the second and succeeding segments with a conspicuous dark brown to black sublateral stripe; intermediate tergites with vague indications of a broken median stripe, most conspicuous as spots on segments four to six; sternites yellow; hypopygium reddish brown. Male hypopygium (Figs. 5, 6) relatively large, highly complex in structure; tergite, sternite and basistyle all completely separated by sutures; eighth sternite moderately sheathing, its sides near base with a conspicuous posterior extension; eighth tergite reduced to a narrow band. Ninth tergite,  $9t$ , relatively small, the

caudal margin convexly rounded, the median portion with a relatively small but deep U-shaped notch, the lateral lobes thus formed low and obtuse. Dististyles as figured, the outer style, *od*, a small flattened spatula. Outer portion of inner dististyle, *id*, produced caudad into a pale membranous flange or blade, the surface of which is microscopically wrinkled but without setae; posterior lobe of style complex, provided with abundant coarse and delicate setae and setulae; sensory group consisting of about a dozen triangular or conical spinous points. Ninth sternite with mesal arms jutting to the mid-ventral line, delicately fringed with golden yellow setae; sternite with caudal portion terminating in a small apiculate point. Eighth sternite, *8s*, with caudal end emarginate, on either side bearing a powerful reddish spine composed of fasciculate bristles, arising from a stout bilobed base, the two spines decussate across the median line; at base of emargination with a pale depressed median lobe or plate, the face of which bears numerous setae. Immediately above this median plate project the rounded ends of conspicuous paired rods arising from the basal portions of the eighth sternite.

*Holotype*, ♂, Gothic, 9,500 ft., July 7, 1934 (*Alexander*). *Paratopotypes*, 5 ♂♂, 9,500-10,600 ft., July 3-19, 1934 (*Alexander & Hallahan*).

The nearest relative of the present fly is *T. (L.) bigeminata* Alexander, 1915, previously discussed. The two species are well distinguished from one another by the coloration of the body and wings, and especially by the quite distinct male hypopygia. Throughout the Nearctic region there are several other members of the same group, all characterized by having large and unusually complex male hypopygia.

*Nephrotoma altissima erythrophrys* (Williston, 1893).—Gothic, 9,500 ft., July 1, 1934. From the studies of Professor J. Speed Rogers, it would appear that both *altissima* (Osten Sacken, 1877) and the present form will better be considered as representing forms of the more eastern *lugens* (Loew, 1864).

#### CYLINDROTOMINAE

*Cylindrotoma pallescens* Alexander, 1930.—Gothic, 9,500-10,000 ft., very numerous along streams at the latter altitude near upper edge of the Biological Forest. The exact relationships existing between *C. americana* Osten Sacken, 1865, *C. juncta* Coquillett, 1900, *C. splendens* Doane, 1900, and the present fly are still not thoroughly understood. It should be observed that in the present fly, the male is much darker in color than the pallid female.

#### LIMONIINAE

##### LIMONIINI

*Limonia (Limonia) indigena jacksoni* (Alexander, 1917).—Described from Geneva Park, Grant, Colorado, 9,500-10,000 ft., July 16-22, 1916 (*L. O. Jackson*). Gothic, 9,500 ft., July 4, 1934; Kebler Pass, 10,100 ft., July 15, 1934 (*Alexander*). I am still uncertain as to whether the present fly should be considered as representing a valid species.

*Limonia (Limonia) sciophila* (Osten Sacken, 1877).—Gothic, 9,500 ft., July 2, 1934.

*Limonia (Limonia) solitaria* (Osten Sacken, 1859).—Gothic, 9,500 ft., July 4, 1934 (*M. M. A.*).

*Limonia (Dicranomyia) ctenopyga* sp. nov. — General coloration dark gray, the praescutum with a conspicuous median blackened stripe that is especially distinct in front; rostrum yellow; antennae black throughout; halteres with strongly infuscated knobs; femora obscure yellow, the tips narrowly and rather weakly infuscated; wings subhyaline, stigma brown, relatively conspicuous;  $Sc_1$  long, only a little shorter than  $R_s$ ; cell  $1st\ M_2$  relatively long, exceeding vein  $M_3$  beyond it; male hypopygium complex; ninth tergite narrowly transverse, with an oval setiferous lobe at the midline; basistyle with the ventro-mesal lobe very large and conspicuous, near outer end with a single row or comb of flattened spinous setae; rostral spines two.

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

Rostrum yellow; palpi dark brown. Antennae black throughout; flagellar segments long-oval; terminal segment about one-third longer than the penultimate; longest verticils a little shorter than the segments. Head dark gray; anterior vertex relatively wide, fully twice the diameter of the scape.

Pronotum dark brown, gray laterally. Mesonotal praescutum dark gray, with a conspicuous median blackened stripe that is especially distinct in front, more obscured and pruinose behind; lateral stripes not or scarcely indicated; humeral region more ochreous pollinose. Pleura heavily gray pruinose, the dorsopleural region and the pleurotergite paler. Halteres of moderate length, stem obscure yellow, knob strongly infuscated. Legs with coxae brownish yellow, knob strongly infuscated. Legs with coxae brownish yellow, their outer surface sparsely pruinose; trochanters yellow; femora obscure yellow, the tips narrowly and rather weakly infuscated; tibiae and tarsi brown. Wings (Fig. 8) subhyaline; stigma brown, relatively conspicuous; prearcular field slightly yellowish; veins brown. Venation:  $Sc_1$  ending about opposite origin of  $R_s$ ,  $Sc_2$  far from its tip,  $Sc_1$  alone only a little shorter than  $R_s$ ; cell  $1st\ M_2$  relatively long, exceeding in length vein  $M_3$  beyond it;  $m-cu$  close to fork of  $M$ ; vein  $2nd\ A$  nearly straight.

Abdominal tergite brownish black, the incisures narrowly paler; sternites darkened basally, the posterior borders broadly pale; ninth segment and principal lobe of ventral dististyle pale, the remainder dark brown. Male hypopygium (Fig. 9) with the tergite,  $9t$ , unusually narrow and transverse, the lateral lobes correspondingly low, with scattered setae; an oval median lobe provided with about eight unusually long and conspicuous setae. Basistyle,  $b$ , with the body small, the ventro-mesal lobe very large and conspicuous, subequal in extent to the ventral dististyle; lobe elongate, somewhat pointed at outer end, before apex with an oblique ridge that is set with a row of conspicuous flattened spinous setae exceeding thirty in number. Dorsal dististyle with the basal third straight, the remainder gently curved, the apex a long

straight spine. Ventral dististyle, *vd*, with the rostral prolongation and its swollen base blackened, the apex of the prolongation a little produced; rostral spines two, relatively stout, placed close together at near one-third the length of prolongation; face of prolongation beyond the spines with about a dozen strong setae; swollen base of prolongation with long conspicuous setae, including a group of unusually long bristles on cephalic mesal portion. Gonapophyses, *g*, with mesal-apical lobe curved to an acute darkened point, the margin of lobe weakly crenate.

*Holotype*, ♂, Copper Creek below Judd Falls, 9,600 ft., July 6, 1934 (Alexander). *Paratopotypes*, 2 ♂♂, in the same place, August 2, 1934 (Alexander).

The most similar species is *Limonia (Dicranomyia) alascaensis* (Alexander, 1919), of Alaska, which is still known to me only from the unique type female. This latter differs in coloration, as the blackened rostrum and the color of the halteres, legs and abdomen, and in the venational details, as the arcuated *Rs* and short, subquadrate cell *1st M*<sub>2</sub>. It seems certain that the male sex of *alascaensis*, when discovered, will show important hypopygial differences.

*Limonia (Dicranomyia) gracilis* (Doane, 1900).—Described from Idaho. Now known to have a wide distribution in the central Rockies. Gothic, 9,500-10,000 ft., July 18-August 1, 1934, the latter specimens in swampy areas along a small stream in the spruce-fir forest of the "Gothic Natural Area." This fly was often taken in company with *L. (D.) vulgata* (Bergroth, 1888).

*Limonia (Dicranomyia) halterata* (Osten Sacken, 1869).—This northern species was originally described from specimens taken in Labrador by Packard. It is now known to have a vast range across all northern North America,

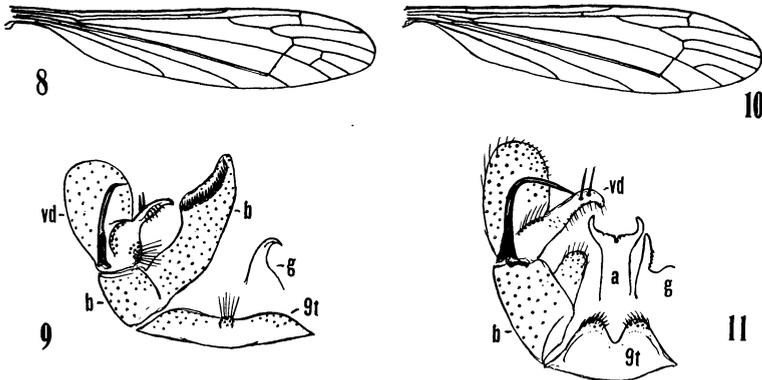


Fig. 8. *Limonia (Dicranomyia) ctenopyga* sp.n.; venation.

Fig. 9. *Limonia (Dicranomyia) ctenopyga* sp.n.; male hypopygium.

Fig. 10. *Limonia (Dicranomyia) vulgata* (Bergroth); venation.

Fig. 11. *Limonia (Dicranomyia) vulgata* (Bergroth); male hypopygium.

(Symbols: a, aedeagus; b, basistyle; g, gonapophysis; t, tergite; vd, ventral dististyle.)

extending southward along the higher Rockies and other mountain ranges. Gothic, 9,500 ft., July 4-12, 1934 (*M. M. A.*).

*Limonia (Dicranomyia) morioides* (Osten Sacken, 1860). — Another characteristic northern species having a distribution much like the last. Gothic, 9,500 ft., July 2-19, 1934, abundant.

*Limonia (Dicranomyia) vulgata* (Bergroth, 1888).—Allied to *immodesta*; general coloration yellow, more or less pruinose, the praescutum with three brown stripes; rostrum yellow; antennae black throughout; wings subhyaline, the stigma scarcely darker;  $Sc_1$  long, exceeding one-half the length of  $R_5$ ; cell  $M_2$  open by atrophy of  $m$ ; male hypopygium with the tergite conspicuously notched; lobe of basistyle simple; dorsal dististyle a slender, strongly curved hook; ventral dististyle fleshy, the rostral spines of moderate length; mesal face of main lobe of style with short spinous setae; mesal-apical lobe of gonapophysis slender and straight, the outer margin microscopically serrulate; aedeagus terminating in conspicuous sclerotized points.

♂. Length about 6-6.5 mm.; wing, 6.5-7.2 mm.

Rostrum yellow; palpi brownish black. Antennae black throughout; flagellar segments passing through short-oval to long-oval, the terminal segment exceeding the penultimate in length; verticils long and conspicuous, exceeding the segments. Head gray, the vertex more or less infuscated medially; anterior vertex wide, approximately three times the diameter of scape.

Pronotum dark brown above, the lateral borders yellow. Mesonotal praescutum yellow, more or less pruinose, with three brown to brownish black stripes, the median one wider and more intense, not reaching the suture behind, the lateral stripes more pruinose; central portion of scutum and scutellum yellow, the lateral portions dark brown, more or less pruinose, parascutella pale; mediotergite darkened on central portion, broadly yellow on sides. Pleura and pleurotergite yellow, with a whitish pruinosity, the pleurotergite a trifle more darkened. Halteres elongate, stem yellow, knob darkened. Legs with the coxae and trochanters yellow; femora obscure yellow, the tips weakly darkened; tibiae brownish yellow; tarsi passing through brown to black. Wings (Fig. 10) subhyaline, unpatterned; stigma varying in intensity, in cases scarcely differentiated from the ground, in other cases pale brown; veins brown, prearcular veins and  $Sc$  more yellow. Venation:  $Sc$  short,  $Sc_1$  ending opposite or shortly before origin of  $R_5$ ,  $Sc_2$  some distance from its tip,  $Sc_1$  alone exceeding one-half the length of  $R_5$ ; cell  $M_2$  open by the atrophy of  $m$ ;  $m-cu$  close to fork of  $M$ .

Abdomen dark brown, the basal sternites more brightened; eighth segment and ninth tergite pale, the basistyles more darkened. Male hypopygium (Fig. 11) with the tergite,  $9t$ , deeply notched medially, the relatively narrow lobes densely provided with blackened setae that are directed strongly mesad. Basistyle,  $b$ , with the ventro-mesal lobe relatively small, simple, with abundant but pale and delicate setae. Dorsal dististyle an unusually long and slender

curved hook, gradually narrowed to the subacute apex. Ventral dististyle, *vd*, pale and fleshy, the mesal face of the main lobe with short spinous setae, those of the outer face much longer and more conspicuous; a row of long setae along base of prolongation; prolongation conspicuous, curved and flattened; rostral spines two, separate at their bases, a little longer than the prolongation beyond the outer spine. Gonapophyses, *g*, with mesal-apical lobe slender, straight, darkened, the tip subacute, the margin back from the tip microscopically serrulate. Aedeagus, *a*, stout, the outer lateral angles produced into conspicuous sclerotized points.

♂, Gothic, 10,000 ft., July 12, 1934 (*Alexander*); ♂♂, 9,500 ft., July 18, 1934 (*Alexander*). The first were taken along streams in the spruce-fir forest near the upper edge of the "Gothic Natural Area," associated with *L. (D.) gracilis* (Doane) and other crane-flies; the latter were swept from swampy areas among small beaver dams near the bridge at Gothic, again associated with *gracilis*.

*Limonia (Dicranomyia) vulgata* is amply distinct from the three most closely allied species, *L. (D.) gladiator* (Osten Sacken, 1859), *L. (D.) immodesta* (Osten Sacken, 1859), and *L. (D.) iowensis* (Rogers, 1926). The structure of the male hypopygium is distinctive, especially the ventral dististyle, with its prolongation, the gonapophyses, and the aedeagus. Among the relatives above listed, it is most similar to *L. (D.) immodesta*. The shortened spinous setae on the mesal face of the ventral dististyle are quite different from those in these related species though somewhat similar to the condition found in the otherwise quite different *L. (D.) modesta* (Wiedemann, 1818).

*Antocha (Antocha) monticola* Alexander, 1917. — Gothic, along East River, 9,500 ft., July 10, 1934.

*Elliptera astigmatica* Alexander, 1912.—Described from British Columbia; known hitherto from the northern Rockies of the United States and Canada. The present records are the most southerly so far made known. Gothic, 10,450-10,600 ft., July 12-19, 1934; especially common near Emerald Lake where they were found resting on the rock faces of small cliffs or occurring in small crannies, with no water present. In the male sex, a surprising range in the size and modification of the radial field of the wing is found, not only in the present species but in others in the same genus throughout the entire Holarctic region. In the present small series, the males show a wing length between 10 and 14.5 mm. In some specimens, the enlargement of the outer radial cells is accompanied by a deepening in color, and, in cases, with a weak spur of a vein near the outer end of cell  $R_1$ , arising from vein  $R_3$ ; in addition, some specimens show weak traces of  $R_2$ , shortly beyond the fork of  $R_5$ . In still other individuals, the normally closed cell 1st  $M_2$  tends to be open by the partial atrophy of the outer deflection of vein  $M_3$ . One specimen, a small male, shows the surprising anomaly of total loss of *m-cu* in both wings; normally this lies from about one-half to its own length before the fork of  $M$ , in rarer cases, closer to the fork. In most specimens, the basal section of



specimens taken were swept from tall herbs where the flies had walked or climbed to a height of two or three feet.

A study of this material shows that the fly is not a *Limnophila* (Hexatomi) but a true *Tricyphona*, belonging to the Pediciini. The eyes are not glabrous, as described by Coquillett but the setae between the ommatidia, while of normal size, are very sparse and scattered, as evidenced by their punctures. The halteres are always slightly longer than the wings, as shown by the following measurements:

♂. Length, about 11-13 mm.; wing, about 1-1.2 mm.; halteres, 1.5-1.7 mm.

♀. Length, about 16-18 mm.; wing, about 1.4-1.6 mm.; halteres, 1.8-2 mm.

The male hypopygium (Fig. 16) indicates that the fly belongs to the *ampla* group, represented by a few species in both the eastern and western Nearctic region. Ninth tergite, *9t*, with the caudal margin subtruncate to very gently rounded, the surface with numerous long pale setae. Apex of basistyle, *b*, with numerous long coarse setae. Outer dististyle a small pale lobe at base of the inner style, provided with elongate setae that exceed in length the lobe itself. Inner dististyle, *d*, 5-lobed, as in the group; two innermost lobes longest, appearing as flattened blades with obtuse tips, their apices with microscopic setulae; innermost lobe with the most basal setae longer and more conspicuous; outer lobes shorter, two of them more pointed at their tips.

Among the Pediciini of the Nearctic fauna, as now known, there are several species showing brachypterism or stenopterism in the female sex or in both sexes. Besides the cases listed below, representing previously described species, I have still other undescribed forms, including one in the genus *Polyangaenus* Doane. The species described as *Limnophila nemoptera* Alexander, 1927, is still known only from the female sex. It will probably be found to be a Pedicine type, possibly a *Dicranota*.

*Pedicia (Tricyphona) aspidoptera* (Coquillett, 1905).—Western United States. Brachypterous in both sexes, wings very reduced.

*Pedicia (Tricyphona) autumnalis* (Alexander, 1917).—Eastern United States and Canada. Female only with slightly reduced wings.

*Pedicia (Tricyphona) degenerata* (Alexander, 1917).—Western North America. Both sexes showing moderate reduction of wings; see next species in this paper.

*Pedicia (Tricyphona) hanna* (Alexander, 1923).—Arctic North America, Pribilof Islands, Alaska. Both sexes strongly brachypterous.

*Pedicia (Tricyphona) subaptera* (Alexander, 1917).—Western United States. Wings moderately reduced in both sexes, exceeding the halteres.

*Pedicia (Nasiternella) hyperborea* (Osten Sacken, 1861).—Arctic and northern North America. Wings of female only very reduced.

*Dicranota (Plectromyia) stenoptera* (Alexander, 1927).—Western United States; both sexes with wings reduced to linear strips, stenopterous; discussed later in this paper.

*Pedicia (Tricyphona) degenerata* (Alexander, 1917).—Described from Geneva Park, Grant, Colorado, 9,500-10,000 ft., July 22, 1916 (E. C. Jackson). Gothic, 9,500-10,000 ft., July 5-18, 1934.

The normal venation and wing shape are as figured (Fig. 12); in even more degenerate individuals, cell  $M_1$  may be lost by atrophy or fusion of the veins concerned (Fig. 13). It seems certain that the present fly represents a distinct species, differing from its nearest ally, *P. (T.) aperta* (Coquillett, 1905), by the coloration of the body, the reduced wings, with correlated changes in venation, and in details of structure of the male hypopygium.

*Dicranota (Rhaphidolabis) cayuga* (Alexander, 1916).—Wide-spread over northern North America. Gothic, 9,500 ft., July 2, 1934.

*Dicranota (Rhaphidolabis) integriloba* sp. nov. — General coloration gray, the praescutum with three more or less distinct brown stripes; antennae 15-segmented; halteres with knobs weakly infuscated; legs pale brown; wings whitish subhyaline, stigma very slightly darker;  $R_{2+3+4}$  longer than the basal section of  $R_5$ ; abdomen brown with a brownish black subterminal ring, hypopygium yellow; male hypopygium with the tergite produced into a conspicuous median lobe that is slightly expanded outwardly, its caudal margin trun-

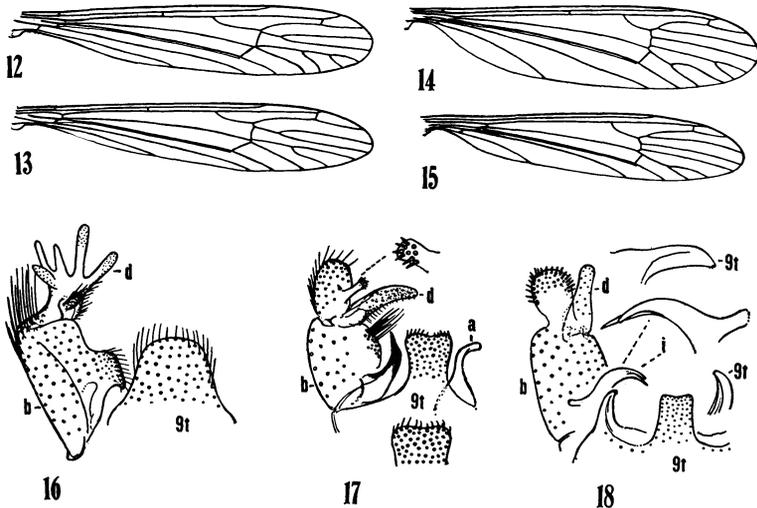


Fig. 12. *Pedicia (Tricyphona) degenerata* (Alexander); normal venation.  
 Fig. 13. *Pedicia (Tricyphona) degenerata* (Alexander); abnormal venation.  
 Fig. 14. *Dicranota (Rhaphidolabis) integriloba* sp. n.; venation.  
 Fig. 15. *Dicranota (Plectromyia) engelmannia* sp. n.; venation.  
 Fig. 16. *Pedicia (Tricyphona) aspidoptera* (Coquillett); male hypopygium.  
 Fig. 17. *Dicranota (Rhaphidolabis) integriloba* sp. n.; male hypopygium.  
 Fig. 18. *Dicranota (Plectromyia) engelmannia* sp. n.; male hypopygium.  
 (Symbols: a, aedeagus; b, basistyle; d, dististyle; t, tergite.)

cate or but weakly emarginate.

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

Rostrum obscure brownish yellow; palpi brownish black. Antennae of moderate length, 15-segmented; flagellar segments short suboval or subcylindrical, the outer segments even more crowded; terminal segment shorter than the penultimate; verticils shorter than the segments. Head dark gray.

Thorax gray, the praescutum with three brown stripes that vary in intensity from pale to dark brown, the median one longer and broader; scutal lobes with brown centers; scutellum and posterior margins of scutal lobes yellow; postnotum gray. Pleura pale gray. Halteres with stem yellow, knob weakly infuscated. Legs with coxae and trochanters yellow; remainder of legs pale brown. Wings (Fig. 14) whitish subhyaline; stigma very slightly indicated; veins pale brown. Venation:  $R_{2+3+4}$  from one and one-half to two times the basal section of  $R_5$ ; cell  $M_1$  about one-half as deep as cell  $M_3$ .

Abdomen brown, with a more brownish black subterminal ring involving segments seven and eight; hypopygium abruptly and conspicuously yellow. Male hypopygium (Fig. 17) with the median tergal lobe,  $9t$ , long and conspicuous, only slightly widened outwardly, the caudal margin subtruncate to weakly emarginate, the lateral angles obtusely rounded, inconspicuous. Mesal face of basistyle,  $b$ , with a row of very long setae that are arranged more or less evidently into two or three groups; interbase broad at base, narrowed to a long acute point. Outer dististyle,  $od$ , with a cylindrical spine-tipped appendage on face. Inner dististyle an elongate, compressed blade, the tip obtuse. Aedeagus,  $a$ , a stout dusky lobe that is bent at a right angle at near midlength, the apex obtusely rounded.

*Holotype*, ♂, Gothic, 9,500 ft., July 6, 1934 (Alexander). *Paratopotypes*, ♂ ♂, 9,500-9,600 ft., July 6-August 2, 1934 (Alexander).

*Dicranota (Rhaphidolabis) integriloba* is quite distinct from the other generally similar regional species of the subgenus. The type of male hypopygium is different from other species of the subgenus, being more like that found in species of the related subgenus *Plectromyia* Osten Sacken, as *petiolata* (Alexander), *engelmannia* sp. nov., and *stenopectera* (Alexander). The male sex of *D. (R.) major* (Alexander) and *D. (R.) sessilis* (Alexander) are still unknown but from the coloration and venation the present fly cannot be referred to either of these flies.

*Dicranota (Plectromyia) petiolata* (Alexander, 1919).—Gothic, 10,000 ft., along a small clear stream in the "Gothic Natural Area," August 1, 1934; 10,100 ft., on trail to Emerald Lake, along a small mountain torrent, July 12, 1934.

*Dicranota (Plectromyia) stenopectera* (Alexander, 1927). — Originally described as a species of *Tricyphona* but from the structure of the male hypopygium certainly a member of this genus and presumably of *Plectromyia*. The wings of both sexes are reduced to linear strips so that the venation is distorted

beyond any taxonomic use. In the present specimens, the wings are slightly longer than in the type, with the venational details a little more evident. Gothic, 9,500 ft., in swampy areas near the beaver dams on East River near bridge, July 18, 1934; 10,500 ft., in wet spots on slopes of Gothic Mt., July 19, 1934 (*Hallahan*).

**Dicranota (Plectromyia) engelmanna** sp. nov. — Size small (wing, male, 4.5 mm.); general coloration ochreous or brownish yellow; head gray; wings with a pale yellow or milky tinge, the veins very pale to scarcely visible; cell  $R_3$  short-petiolate; male hypopygium with the median region of tergite produced caudad into a rectangular lobe that is nearly parallel-sided, its apex truncate or virtually so.

♂. Length, about 4.4-5 mm.; wing, 4.5 mm.

♀. Length, about 5.5 mm.; wing, 5.5 mm.

Rostrum pale; palpi black. Antennae brownish black; flagellar segments oval, the outer segments smaller. Head gray.

Thorax almost uniformly ochreous or brownish yellow, the praescutum a little darker, slightly pruinose; thorax narrow, the praescutum produced cephalad. Halteres pale, apex of knob dark brown. Legs with the coxae and trochanters yellow; legs dark brown, the proximal portions of femora and basitarsi restrictedly pale; legs relatively long and slender. Wings (Fig. 15) small, with a pale yellow or milky tinge, the veins very pale to scarcely visible against the ground; no stigma or other darkened pattern. Sparse macrotrichia on veins beyond cord. Venation:  $Sc_1$  ending just beyond fork of  $R_{2+3+4}$ ,  $Sc_2$  not evident;  $R_s$  strongly arcuated to feebly angulated at near midlength;  $R_{2+3+4}$  about equal in length to the basal section of  $R_5$ ;  $R_2$  subequal to  $R_{1+2}$ ; cell  $M_3$  much shorter than its petiole, in cases only about one-half to one-third its length beyond fork of  $M$ ; cell  $2nd A$  relatively wide.

Abdomen brownish yellow to pale brown, in male with a narrow, darker brown subterminal ring; hypopygium clear yellow. Male hypopygium (Fig. 18) of the general type of structure of *petiolata*. Ninth tergite,  $9t$ , with the median area produced into a rectangular lobe, nearly parallel-sided and with the apex truncate or with a very shallow notch; outer lobes of tergite appearing as simple flattened blades, their tips subacute, slightly arcuated and microscopically denticulate at tips. Basistyle,  $b$ , with the apical lobe broad, provided with abundant spinulae; interbase,  $i$ , slender, at apex split into two slender points, one a little longer and more acute than the other. Dististyle,  $d$ , narrowed outwardly, the tip obtuse.

*Holotype*, ♂, Biological Forest, above Gothic, 10,000 ft., August 1, 1934 (*Alexander*). *Allotopotype*, ♀, mounted with type. *Paratopotypes*, 8 ♂ ♀. These specimens occurred in swampy areas along a small clear stream flowing through the spruce-fir forest. Associated with *Dicranota (Plectromyia) petiolata* (*Alexander*), *Limonia (Dicranomyia) gracilis* (*Doane*), *L. (D.) vulgata* (*Bergroth*), and others mentioned in this report.

The nearest relatives are *Dicranota (Plectromyia) petiolata* and *D. (P.) reducta* (Alexander), both of which differ conspicuously in the structure of the male hypopygium. In the conformation of the median tergal lobe, the present fly is more like *reducta* but the other structures are different.

## HEXATOMINI

***Limnophila (Elaeophila) aldrichi alticrista* subsp. nov. —**

♂. Length, about 7.5 mm.; wing, 8 mm.

♀. Length, about 8.5 mm.; wing, 9 mm.

Differs from typical *aldrichi* Alexander, 1927, from the northern Rocky Mountains (Alberta, Montana) chiefly in the details of structure of the male hypopygium, especially the very high crest of the outer dististyle (Fig. 25, *od*). In the typical form, the style is proportionately narrower and the crest is low and relatively inconspicuous (Proc. U.S. Nat. Mus., 72, art. 2, pl. 1, fig. 6; 1927).

*L. (E.) angustior* Alexander, 1919, of Colorado to Montana, has the structure of the male hypopygium quite distinct, the apex of basistyle being provided with numerous, very long, yellow setae that exceed in length the longest dististyle. Outer dististyle long and narrow, its apical point relatively small.

*Holotype*, ♂, Gothic, 9,500 ft., July 6, 1934 (Alexander). *Allotopotype*, ♀, 9,800 ft., July 8, 1934. *Paratopotypes*, ♂ ♀, 9,800 ft., July 3, 1934; 10,100 ft., July 12, 1934.

*Limnophila (Phylidorea) claggi* Alexander, 1930.—Gothic, 9,800-10,100 ft., in swampy areas, July 3-12, 1934. The nearest relative is *L. (P.) subcostata* (Alexander, 1911), of northeastern North America, well-distinguished by the gray coloration instead of the polished black of the present fly.

*Limnophila (Phylidorea) platyphallus* Alexander, 1926.—Gothic, 9,500 ft., July 7, 1934. Widespread throughout northeastern and northern North America. Although allied to the European *L. (P.) fulvonervosa* (Schummel, 1829), the present fly is amply distinct.

*Limnophila occidens* Alexander, 1924.—Gothic, 9,800 ft., July 3-10, 1934; common in the special study area on the slopes of Gothic Mt. and along the East River. Swarming among the Engelmann's Spruce, usually in groups of from three to ten. Also taken at Monarch Pass, Colorado, 10,500 ft., July 1, 1934; swept from among the spruce and firs near the crest of the pass. This is the largest known species of the *nemoralis (brevifurca)* group, with numerous representatives in Europe and eastern Asia, together with the much smaller *L. brevifurca* Osten Sacken, 1859, of northeastern and eastern North America.

*Shannonomyia oslari* (Alexander, 1916).—Gothic, 9,500-10,100 ft., July 2-12, 1934; Monarch Pass, 10,500 ft., July 1, 1934. Widespread throughout the central Rockies.

*Hexatoma (Eriocera) eriophora* (Williston, 1894).—Gothic, 9,500-10,000 ft., July 7-12, 1934. Williston's types were from Washington State. The present material has the antenna of male a little shorter than in the type (8 mm.) but in other regards the specimens agree sufficiently well with the description and other determined material in my collection.

♂. Length, about 16-17 mm.; wing, 16-18 mm.; antenna, 7-7.5 mm.

♀. Length, about 23-24 mm.; wing, 19 mm.; antenna, about 5 mm.

#### ERIOPTERINI

*Gonomyia (Idiocera) gothicana* sp. nov. — General coloration yellow, variegated with dark brown; thoracic pleura striped with yellow and brown, the dorsal dark stripe not involving the pteropleurite; wings yellowish gray, unpatterned except for the vaguely darkened stigma;  $Sc_1$  very long; male hypopygium with both the intermediate dististyle and inner dististyle bifid; aedeagus with three strong black spines near apex, the larger more basal spine directed strongly cephalad.

♂. Length, about 6-6.5 mm.; wing, 6.5-6.8 mm.

Rostrum pale yellow; palpi black. Antennae with the scape yellow above, darker beneath; remainder of antennae black; flagellar segments oval, the outer segments becoming more elongate. Head light yellow, the posterior portion and a median line on vertex brown; anterior vertex broad.

Pronotum brownish gray, the lateral margin narrowly yellow; pretergites yellow. Mesonotal praescutum brownish gray, the humeral and lateral portions abruptly light yellow; posterior sclerites of notum darkened, the scutellum not or scarcely brightened; mediotergite with lateral margin narrowly yellow, the pleurotergite more extensively brightened, the ventral margin brown. Pleura light yellow, variegated longitudinally with brown, including a dorsal stripe from the propleura across the anepisternum, not including the pteropleurite which is uniformly pale; a fainter and more restricted brown darkening on the ventral sternopleurite and meron. Halteres relatively long, stem obscure yellow, knob weakly darkened. Legs with the coxae and trochanters yellow; remainder of legs obscure yellow, the tips of tibiae narrowly and vaguely darkened; outer tarsal segments more blackened. Wings (Fig. 19) yellowish gray subhyaline, unpatterned except for the pale brownish yellow stigma that is only a trifle darker than the ground; prearcular and costal fields more yellow, including the veins; remaining veins pale brown, delicate. Venation:  $Sc$  long,  $Sc_1$  ending about opposite one-half to four-fifths the length of  $R_5$ ,  $Sc_2$  far from its tip, opposite the origin of  $R_5$  or only slightly beyond,  $Sc_1$  alone subequal to or exceeding the petiole of cell  $R_3$ ;  $R_5$  elongate, arcuated at origin; faint indications of vein  $R_2$  at proximal end of stigma; veins  $R_{1+2}$  and  $R_3$  only narrowly separated at wing margin;  $m-cu$  much more than its own length before fork of  $M$ .

Abdominal tergites dark brown, the lateral borders narrowly, the posterior

margins more broadly pale, becoming more extensive on the outer segments, especially the eighth; sternites and hypopygium chiefly pale. Male hypopygium (Fig. 27) with the outer dististyle, *od*, a slender simple rod, the acutely pointed distal fourth blackened. Intermediate dististyle, *md*, without setae, longer than the other styles, bifid, the outer arm slender, narrowed to a long acute point; shorter arm darkened, less than one-half the length of the outer arm. Inner dististyle, *id*, profoundly bifid, the outer arm a slender pale spine, its acute apex blackened; inner arm shorter but stouter, provided with sparse delicate setulae. Apical lobe of basistyle, *b*, relatively long, extended caudad about to the outer end of the outer dististyle, provided with numerous long setae. Aedeagus, *a*, a stout rod, near apex produced into a recurved blackened spine, with two smaller spines still closer to tip.

*Holotype*, ♂, Gothic, 9,500 ft., July 11, 1934 (Alexander). *Paratopotypes*, 2 ♂♂, July 2, 1934 (Alexander).

*Gonomyia (Idiocera) gothicana* is very different from all other regional members of the subgenus, especially in the structure of the male hypopygium, notably the dististyles and aedeagus. In the armature of the latter the species is approached only by *G. (I.) mathesoni* Alexander, of northeastern North America, which is otherwise an entirely different fly. In the structure of the male hypopygium, the species is closer to the eastern Palaearctic *G. (I.) pallens* Alexander, 1928, and *G. (I.) perpallens* Alexander, 1938, which differ chiefly in relatively minor details of structure of the dististyles.

*Gonomyia (Gonomyia) extensivena* sp. nov. — General coloration yellow, patterned with dark brown; rostrum yellow; antennae entirely black, the outer flagellar segments elongate; head dark gray; scutellum yellow; central region of scutum and lateral portions of mediotergite extensively yellow; pleura chiefly yellow, restrictedly patterned with darker; knobs of halteres infuscated; legs brownish black to black; wings grayish subhyaline, stigma very slightly darker; *Sc* long to very long, *Sc*<sub>1</sub> ending from one-fifth to approximately one-half the length of *Rs*; *m-cu* just beyond fork of *M*; male hypopygium with the outer dististyle slender, straight, with a narrow blackened flange before apex; inner dististyle a compressed blade, bearing a long curved spine, with a smaller lateral spine on its face; phallosome with two unequal black spines and a longer compressed blade of irregular conformation.

♂. Length, about 5.8-6 mm.; wing, 6.5-6.7 mm.

♀. Length about 6.5 mm.; wing, 6.5 mm.

Rostrum varying from light sulphur yellow to more obscure yellow; palpi black. Antennae black throughout, relatively elongate; outer flagellar segments very elongate-oval to subcylindrical, the outer segments exceeding the verticils in length. Head dark gray.

Pronotum and pretergites light yellow, the scutellum narrowly and vaguely darkened medially. Mesonotal praescutum dark brownish gray, the lateral and

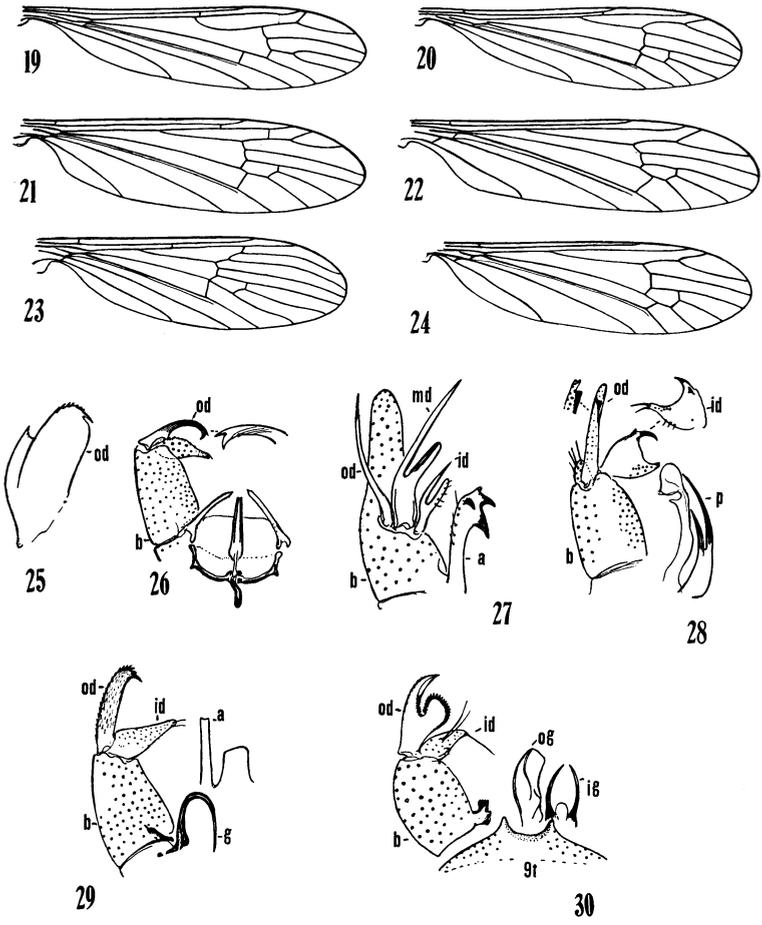


Fig. 19. *Gonomyia (Idiocera) gothicana* sp. n.; venation.  
 Fig. 20. *Gonomyia (Gonomyia) extensivena* sp. n.; venation.  
 Fig. 21. *Rhabdomastix (Sacandaga) leptodoma* sp.n.; venation.  
 Fig. 22. *Rhabdomastix (Sacandaga) neolurida* sp. n.; venation.  
 Fig. 23. *Erioptera (Ilisia) hygropetrica* sp. n.; venation.  
 Fig. 24. *Rhabdomastix (Sacandaga) neolurida setigera* subsp. n.; venation.  
 Fig. 25. *Limnophila (Elacophila) aldrichi alticrista* subsp.n.; male hypopygium.  
 Fig. 26. *Rhabdomastix (Sacandaga) leptodoma* sp. n.; male hypopygium.  
 Fig. 27. *Gonomyia (Idiocera) gothicana* sp. n.; male hypopygium.  
 Fig. 28. *Gonomyia (Gonomyia) extensivena* sp.n.; male hypopygium.  
 Fig. 29. *Rhabdomastix (Sacandaga) neolurida* sp. n.; male hypopygium.  
 Fig. 30. *Erioptera (Ilisia) hygropetrica* sp. n.; male hypopygium.  
 (Symbols: a, ædeagus; b, basistyle; g, gonapophysis; id, inner dististyle; ig, inner gonapophysis; md, intermediate dististyle; od, outer dististyle; og, outer gonapophysis; p, phallosome; t, tergite.)

humeral portions broadly light yellow, the central region restrictedly brightened at the suture; scutum yellow, the lobes extensively brownish gray, the dark color continued across the mid-line at the posterior portion of the scutum; scutellum broad, light yellow; mediotergite brownish gray, the cephalic-lateral portions broadly yellow; pleurotergite yellow, the ventral portion darkened. Pleura chiefly yellow, the ventral sternopleurite and meron abruptly darkened; a small dark cloud on anepisternum, not forming a longitudinal stripe. Halteres relatively elongate, stem yellow, knob infuscated. Legs with coxae more or less infuscated; trochanters brownish yellow; remainder of legs brownish black to black, the femoral bases more or less obscure yellow. Wings (Fig. 20) grayish subhyaline, the oval stigma very slightly darker, ill-delimited; prearcular and costal fields slightly more yellow, including the veins; remaining veins brown. Costal fringe relatively short. Venation: *Sc* unusually long for a member of this genus, *Sc*<sub>1</sub> ending from about opposite one-fifth to fully one-half the length of *R*<sub>5</sub>, *Sc*<sub>2</sub> a short distance from its tip; *R*<sub>2+3+4</sub> elongate, gently arcuated, about four-fifths the length of *R*<sub>5</sub> and fully twice *R*<sub>3</sub>; *m-cu* just beyond fork of *M*.

Abdominal tergites dark brown, the incisures and lateral borders yellow; sternites yellow; hypopygium uniform yellow except for the blackened styli and apophyses. Male hypopygium (Fig. 28) with the apical lobe of basistyle, *b*, small and oval, pale. Outer dististyle, *od*, a slender elongate lobe, before apex bearing a narrow blackened flange. Inner dististyle, *id*, a compressed blade, the outer margin and angle produced into a curved blackened spine that bears a smaller tooth or flange on its face near base; rostral prolongation of style relatively slender, bearing the two usual fasciculate setae. Phallosome, *p*, consisting of an elongate flattened yellow blade of irregular conformation and two slender blackened spines, one much shorter and more slender than the other.

*Holotype*, ♂, Gothic, 10,100 ft., July 12, 1934 (Alexander). *Paratopotypes*, ♂ ♀, 9,500 ft., July 31, 1934 (Alexander). The types were collected along a small mountain stream on the trail to Emerald Lake; the paratype and other material from swampy areas near the beaver dams at Gothic.

*Gonomyia (Gonomyia) extensivena* is readily told from all other described regional species of the genus by the elongate *Sc*. In other forms, this vein ends opposite or before the origin of *R*<sub>5</sub>. The structure of the male hypopygium is likewise distinctive.

*Gonomyia (Gonomyia) filicauda* Alexander, 1916.—Gothic, 9,500-10,000 ft., July 2-August 3, 1934, abundant.

*Gonomyia (Gonomyia) poliocephala* Alexander, 1924.—Gothic, 9,500 ft., July 31, 1934.

*Rhabdomastix (Sacandaga) leonardi* Alexander, 1930.—The species was originally described from Montana; now known to be widely distributed in the northern and central Rocky Mountains. The unique type was preserved in

alcohol and the normal pruinosity lost; as surmised at the time of the original description, in fresh specimens the dark coloration is more or less obscured by a gray bloom. Gothic, 9,500 ft., July 7, 1934; swept from low vegetation along the East River.

**Rhabdomastix (Sacandaga) leptodoma** sp. nov. — General coloration gray, the praescutum without clearly indicated praescutal stripes, halteres uniformly pale yellow; legs brownish black, the femoral bases yellow; wings subhyaline, the base narrowly pale yellow; stigma oval, pale brown;  $Sc_1$  ending about opposite fork of  $R_5$ ,  $R_2$  weakly preserved, at about midlength of petiole of cell  $R_3$ ; cell *1st*  $M_2$  rectangular, *m-cu* about one-half its length beyond the fork of  $M$ ; male hypopygium with the outer dististyle slender, bidentate at apex; gonapophyses long and narrow, even more slender than the aedeagus.

♂. Length, about 4.4-2 mm.; wing, 4.8-5 mm.

Rostrum and palpi black. Antennae short, black, the scape pruinose; flagellar segments oval to long-oval, the longest verticils exceeding the segments in length. Head dark gray; vertex broad.

Pronotum gray; anterior lateral pretergites almost white. Mesonotum and pleura uniform light gray, the praescutal stripes not or scarcely indicated; scutellum a trifle brightened. Halteres uniformly pale yellow. Legs with the coxae obscure brownish yellow or testaceous yellow, the fore pair somewhat darker; trochanters obscure yellow; remainder of legs dark brown to brownish black, the femoral bases yellow. Wings (Fig. 21) subhyaline, the base narrowly pale yellow; stigma oval, pale brown, ill-delimited; veins brown, yellow at the wing base. Venation:  $Sc_1$  ending opposite or just before the fork of  $R_5$ ,  $Sc_2$  a short distance from its tip;  $R_2$  preserved as a weak element at or just beyond midlength of petiole of cell  $R_3$ ; vein  $R_3$  oblique, cell  $R_3$  relatively small; cell *1st*  $M_2$  rectangular; *m-cu* about one-half its length beyond the fork of  $M$ ; vein *2nd*  $A$  nearly straight, the cell of moderate width only.

Abdomen black, heavily gray pruinose; base of hypopygium a little brightened, the styli dark. Male hypopygium (Fig. 26) of the general type of *monticola*. Outer dististyle, *od*, much more slender and less flattened, conspicuously bidentate at apex but with other denticles or points lacking or reduced to vague roughenings on the lower margin before the ventral spine. Apex of inner dististyle narrowed. Gonapophyses, *g*, longer and narrower than *monticola*, a trifle longer but more slender than the aedeagus.

Holotype, ♂, Gothic, 9,600 ft., along Copper Creek below Judd Falls, July 6, 1934 (Alexander). Paratopotype, ♂, August 2, 1934.

The nearest relative is *Rhabdomastix (Sacandaga) monticola* Alexander, which differs especially in the venation and in details of structure of the male hypopygium, as compared above. The normal species of the genus have the outer dististyle quite different in structure, with abundant spines and spicules scattered over the entire outer surface.

*Rhabdomastix (Sacandaga) subfasciger* Alexander, 1927.—Gothic, 9,500 ft., July 6, 1934; Kebler Pass, 10,000 ft., July 15, 1934. In the present species there is some variation in the length of vein  $R_4$ , in cases this being subequal to the petiole of cell  $R_3$ , in other specimens slightly exceeding this distance.

***Rhabdomastix (Sacandaga) neolurida*** sp. nov. — Belongs to the *lurida* group; general coloration dark brown and yellow, the praescutum patterned with two more or less distinct intermediate dark stripes; pleura variegated with dark brown; fore femora chiefly blackened, the remaining femora obscure yellow with their distal ends narrowly blackened; wings subhyaline, the prearcular and costal portions slightly more yellow;  $R_3$  relatively short,, oblique; male hypopygium with the gonapophyses unusually elongate, gradually narrowed to the very long acute blackened points.

♂. Length, about 4.5-5 mm.; wing, 5.4-5.8 mm.; antenna, about 1.5-1.6 mm.

♀. Length, about 5.5-5 mm.; wing, 5.5-6 mm.

Rostrum obscure brownish yellow to yellow; palpi black. Antennae black throughout, relatively elongate in male, as shown by the measurements; flagellar segments passing through oval to elongate oval, the more basal segments with one face slightly more protuberant; segments clothed with a dense erect pale pubescence that is shorter than the diameter of the segment; verticils shorter than the segments, unilaterally distributed. Head gray; anterior vertex wide.

Pronotum light yellow, restrictedly darkened medially. Mesonotal praescutum almost uniform dark brown, sparsely pruinose, the humeral and lateral portions restrictedly more yellow; in cases, the praescutum with more or less distinct intermediate dark stripes; pseudosutural foveae large, reddish brown; scutum and scutellum chiefly dark brown, the posterior margin of latter, with the parascutella, paler; postnotum chiefly yellow, the posterior portion narrowly more darkened; in cases, the postnotum more uniformly blackened. Pleura obscure yellow, conspicuously patterned with dark brown on the anepisternum, ventral sternopleurite and meron. Halteres uniformly pale yellow. Legs with the coxae more or less infuscated, especially the fore pair; trochanters obscure yellow; fore femora chiefly blackened, the basal third obscure yellow; remaining femora yellow, the tips more narrowly blackened, narrowest on the posterior pair where about the outer seventh is included; fore tibiae and tarsi brownish black to black; middle and posterior tibiae and basitarsi obscure yellow, their tips blackened; remainder of tarsi black. Wings (Fig. 22) subhyaline, the prearcular and costal fields slightly more yellow; veins dark brown, those of basal and cephalic portions more yellow. Venation:  $Sc$  relatively long,  $Sc_1$  ending a short distance before fork of the long  $Rs$ ,  $Sc_2$  atrophied; vein  $R_3$  relatively short, oblique, the distance on costa between  $R_{1+2}$  and  $R_3$  nearly equal in length to vein  $R_3$  alone;  $m-cu$  oblique, at near midlength of cell  $1st M_2$ . In cases, a vague trace of vein  $R_2$  present, placed just before midlength of petiole of cell  $R_3$ .

Abdominal segments black, the lateral borders very narrowly yellow; hypopygium brownish black. Male hypopygium (Fig. 29) with the outer dististyle, *od*, relatively narrow, the apical point stout. Gonapophyses, *g*, unusually long, gradually narrowed to very long acute blackened points.

*Holotype*, ♂, Arizona Creek, Grand Tetons National Forest, Wyoming, 6,700 ft., July 8, 1941 (*Alexander*). *Allotopotype*, ♀. *Paratopotypes*, numerous ♂ ♀.

In addition to the above described species, I am further differentiating a subspecies of the same.

***Rhabdomastix (Sacandaga) neolurida setigera*** subsp. nov. — Compared with the typical subspecies, differs as follows: Antennae (male) even more elongate, the individual flagellar segments correspondingly longer; erect pale pubescence of segments longer and more conspicuous, exceeding in length the transverse diameter of a segment. Wings (Fig. 24) broader, with the veins medium brown, more uniform in color over the entire disk. Venation: Cells correspondingly wider, due to the increase in wing width;  $R_{2+3+4}$  only about one-third longer than  $R_3$ , in the typical form nearly twice the length of this vein;  $R_3$  even more longitudinal in position, in approximate alignment with  $R_{2+3+4}$ . Male hypopygium with the gonapophyses less elongate, especially the narrowed apical portion.

*Holotype*, ♂, Gothic, 9,500 ft., July 6, 1934 (*Alexander*). *Allotopotype*, ♀, with the type. *Paratopotypes*, several ♂ ♀, July 9-18, 1934.

The *lurida* group of *Rhabdomastix* is well-distinguished by the loss of vein  $Sc_2$  and the pointed gonapophyses. To this date, members of the group were known only from Eurasia (*inclinata* Edwards, 1938; *lurida* Loew, 1873, of the western Palearctic region; *luridoides* Alexander, 1940, of the eastern Palearctic region). The present fly is closest to *luridoides*, differing especially in the coloration and details of structure of the male hypopygium. The two European species have the gonapophyses much shorter than in the other species though still pointed at their tips. The exact homologies of these latter structures still remain in question. Both Edwards (1938) and Alexander (1940) considered them as representing parameres (gonapophyses) but from their position I am not at all certain of this homology, it being at least possible that they are actually interbases.

*Erioptera (Erioptera) septemtrionis* Osten Sacken, 1859.—Gothic, slopes of Mount Avery, 10,000 ft., July 5, 1934 (*Hallahan*); Gothic Valley, on trail to Emerald Lake, 10,000 ft., July 12, 1934 (*M. M. A.*). *E. (E.) subseptemtrionis* Alexander, 1920, seems now not to be separable from typical *septemtrionis*.

***Erioptera (Ilisia) hygropetrica*** sp. nov. — General coloration dull black, sparsely pruinose; antennae black throughout; halteres elongate, dark; wings

with a strong brown tinge, the stigmal region and anterior cord vaguely darkened; cell *1st M*<sub>2</sub> closed, small; *m-cu* close to the fork of *M*; vein *2nd A* nearly straight; male hypopygium with the mesal face of basistyle produced into a short arm that bears conspicuous blackened points; outer dististyle bifid, the inner arm with conspicuous slender teeth.

♂. Length, about 4.5-5 mm.; wing, 5.8-6.2 mm.

♀. Length, about 4.5 mm.; wing, 5 mm.

Rostrum dark gray; palpi black. Antennae black throughout; flagellar segments oval, with long outspreading verticils. Head black, sparsely dusted with gray.

Pronotum brownish black, the scutellum more reddish brown. Mesonotum dull black, the surface sparsely pruinose. Pleura black, sparsely pruinose. Halteres unusually long and slender for a member of this genus, stem dusky, knob even darker. Legs with the coxae and trochanters brownish black; remainder of legs brownish black, the terminal tarsal segments blackened; vestiture of legs relatively short and appressed. Wings (Fig. 23) broad, with a strong brownish tinge, the stigmal region and anterior cord vaguely seamed with darker; veins brown. Venation: *Sc*<sub>1</sub> ending opposite *R*<sub>2</sub>, *Sc*<sub>2</sub> about opposite one-fourth to one-third the length of *R*<sub>5</sub>; cell *1st M*<sub>2</sub> closed, small, less than one-half vein *M*<sub>4</sub> beyond it; *m-cu* close to the fork of *M*, in cases shortly beyond this fork; vein *2nd A* nearly straight, cell *2nd A* relatively narrow.

Abdomen, including hypopygium, black. Male hypopygium (Fig. 30) having the caudal margin of ninth tergite, *9t*, with a broad U-shaped notch, the adjoining lobes thus formed unusually slender. Basistyle, *b*, with mesal face at cephalic end produced into a short arm that bears conspicuous blackened denticles. Outer dististyle, *od*, bifid, blackened, the outer arm more slender, with appressed teeth on outer margin; inner arm shorter and broader, the margin with numerous slender teeth, their tips obtuse. Inner dististyle, *id*, shorter, pale, the narrowed tip bearing a single strong seta; face of style with a tubercle tipped with two even longer setae. Outer gonapophysis, *og*, appearing as a flattened pale blade, the tip obtuse. Inner gonapophysis, *ig*, appearing as slender, gently curved horns that subtend the short aedeagus, each gradually narrowed into a pale acute point.

*Holotype*, ♂, 9,500 ft., July 13, 1934 (*Alexander*). *Allotopotype*, ♀, July 29, 1934. (*M. M. Alexander*). *Paratopotypes*, 5 ♂♂, July 13-19, 1934 (*Alexander*). This very interesting crane-fly was found only along East River near the old saw-mill, under conditions described under the account of *Elliptera coloradensis* Alexander on a previous page. The flies were taken while resting in the dryer places on the vertical wooden wall where a film of water constantly trickled and flowed. Here it was associated with numerous other hygropetric Diptera of several families, including the *Elliptera*. A single specimen of *Ormosia* (*Ormosia*) *hallahani* sp. nov. was also secured here.

*Erioptera* (*Ilisia*) *hygropetrica* is very different from all other described

American species of the genus. In its venation, it is closest to the various light yellow species that center about *microcellula* but it is entirely different in coloration and in the structure of the male hypopygium.

*Erioptera (Ilisia) lucia* Alexander, 1914.—Gothic, 9,500-10,100 ft., July 9-12, 1934. Other records: Estes Park, Colorado, August 10, 1919 (*Claassen*); Webster, Colorado, August 24, 1915 (*E. J. Oslar*).

*Erioptera (Ilisia) margarita* Alexander, 1919.—Gothic, 9,500 ft., July 2-11, 1934. Other record: Colorado Springs, Colorado, June 8, 1915 (*M. C. VanDuzee*).

*Erioptera (Ilisia) microcellula* Alexander, 1914.—Above Gothic, 10,100 ft., July 12, 1934; along a small clear mountain stream, common.

*Erioptera (Psiloconopa) aperta* (Coquillett, 1905) (*mormon* Alexander, 1927).—Gothic, 9,500 ft., July 2-6, 1934. A common and wide-spread species throughout the central and northern Rockies. The distinctions used to separate the subgeneric groups *Psiloconopa* Zetterstedt, 1838, and *Ilisia* Rondani, 1856, are becoming more difficult to maintain as new species are constantly being discovered.

*Erioptera (Psiloconopa) gaspicola* (Alexander, 1929).—Gothic, 9,500 ft., July 19, 1934. Hitherto known only from the Gaspé Peninsula, eastern Quebec.

*Erioptera (Helobia) cana* (Walker, 1848).—Gothic, 9,500 ft., July 4-12, 1934.

*Erioptera (Mesocyphona) splendida* (Alexander, 1913).—Gothic, 9,500-10,100 ft., July 4-12, 1934.

*Erioptera (Empeda) cinereipleura* (Alexander, 1917).—Gothic, 9,500 ft., July 4, 1934.

**Ormosia (Ormosia) megarhabda** sp. nov. — General coloration brownish gray, the praescutum with a conspicuous, darker brown, median stripe; antennae black throughout; halteres yellow; leg dark brown to brownish black; wings with a faint yellowish tinge, unpatterned; macrotrichia of cells long but sparse; cell  $M_2$  open by atrophy of  $m$ ; vein 2nd  $A$  elongate, subsinuous; male hypopygium with the dististyles apical in position, outer style profoundly bifid, both arms microscopically spiculate; inner dististyle gently arcuated; gonapophyses appearing as very powerful blackened horns.

♂. Length, about 4.5-5 mm.; wing, 5-6 mm.

♀. Length, about 5.5 mm.; wing, 5.5 mm.

Rostrum brownish black; palpi dark brown. Antennae black throughout; flagellar segments oval, those of more than the outer half with segments more slender and attenuated; verticils very long and conspicuous, especially on the more proximal segments. Head dark brown.

Pronotum brownish gray; pretergites conspicuously light yellow. Mesonotum brownish gray, the praescutum with a conspicuous, darker brown, median stripe, the lateral stripes not or but poorly differentiated; scutellum more yellowish brown to obscure yellow. Pleura brownish gray; dorso-pleural region slightly paler. Halteres yellow throughout. Legs with coxae brownish gray; trochanters brownish yellow; remainder of legs dark brown to brownish black. Wings (Fig. 31) with a faint and uniform yellowish tinge, without pattern; veins brown. Cells of wing with sparse but conspicuous, elongate setae, distributed over the entire wing surface; macrotrichia of veins only a trifle longer and stouter. Venation:  $Sc_1$  ending about opposite  $R_2$ ,  $Sc_2$  at near midlength of  $R_3$ ; cell  $M_2$  open by atrophy of  $m$ ; vein  $2nd\ A$  elongate, feebly sinuous to nearly straight, about intermediate in condition between strongly arcuated to straight.

Abdomen dark brown, the hypopygium slightly brightened. Male hypopygium (Fig. 36) with the basistyle,  $b$ , simple, at apex produced into a short conical lobe. Outer dististyle,  $od$ , profoundly bifid on outer half, both arms microscopically spiculate, one arm much stouter than the other. Inner dististyle,  $id$ , a long slender gently arcuated pale blade. Gonapophyses,  $g$ , appearing as very powerful blackened simple horns on either side of the very small aedeagus.

*Holotype*, ♂, 9,500 ft., July 4, 1934 (Alexander). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, numerous ♂ ♀, July 7-19, 1934 (Alexander).

*Ormosia (Ormosia) megarhabda* is very distinct from the other Nearctic species of the genus so far described. The venation is almost identical with that of the genus *Erioptera* but from the presence of sparse but conspicuous trichia over the entire wing surface, it seems that the fly is better assigned to *Ormosia*. The structure of the male hypopygium, especially of the gonapophyses, is very different from that of other members of the genus.

*Ormosia (Ormosia) hallahani* sp. nov. — General coloration black, the mesonotum only sparsely pruinose so that the surface appears subnitidous; head and thoracic pleura heavily gray pruinose; halteres pale yellow; femora yellow, the tips narrowly but conspicuously blackened; wings whitish subhyaline, the stigma conspicuous, dark brown; a brown seam along vein  $Cu$ , with more restricted markings along cord and as a delicate border to the wing; cell  $1st\ M_2$  closed; anal veins divergent; male hypopygium with the basistyle profoundly notched, to produce a ventral and a dorsal lobe, the dististyles arising from this notch; inner dististyle slender, especially the distal half which appears as a long straight spine.

♂. Length, about 5 mm.; wing, 5.8-6 mm.

Rostrum and palpi black. Antennae black throughout; flagellar segments oval, the verticils shorter than the segments. Head black, heavily pruinose.

Pronotum dark brown, the pretergites conspicuously light yellow, the marking continued caudad to the wing-root. Mesonotal praescutum black, the surface very sparsely pruinose so the general appearance is subnitidous; posterior callosities of scutal lobes more reddish brown. Pleura black, heavily gray pruinose. Halteres pale yellow. Legs with the coxae pale brown; trochanters yellow; femora yellow, the tips narrowly but conspicuously blackened, the amount subequal on all legs; tibiae and basitarsi obscure yellow, the tips narrowly blackened, remainder of tarsi black. Wings (Fig. 32) whitish subhyaline, patterned with dark brown, including an unusually conspicuous stigmal area; a conspicuous brown seam along vein *Cu* and narrower darkenings along cord and as a delicate border from vein *R*<sub>3</sub> continued entirely around the wing to

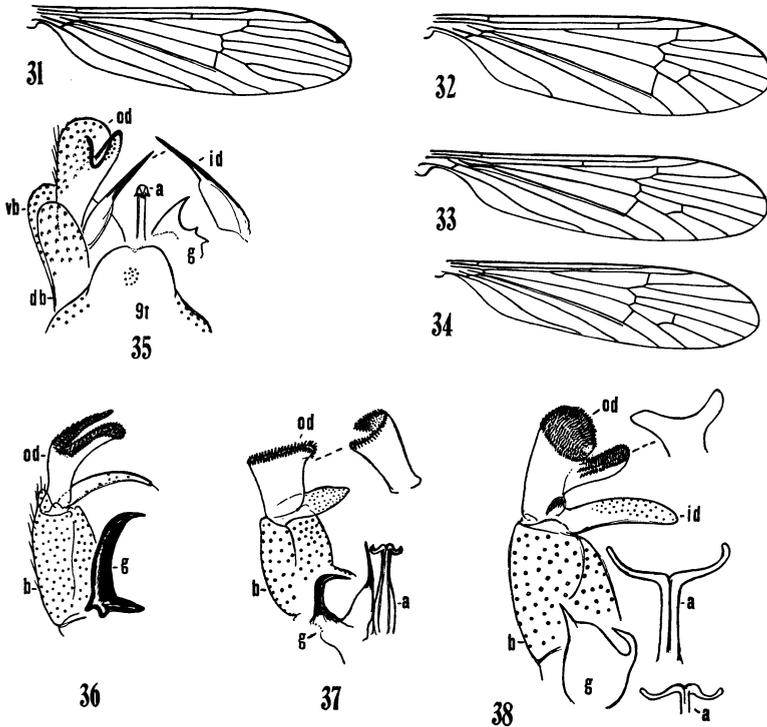


Fig. 31. *Ormosia (Ormosia) megarhabda* sp. n.; venation.

Fig. 32. *Ormosia (Ormosia) hallahani* sp.n.; venation.

Fig. 33. *Ormosia (Ormosia) libella* sp.n.; venation.

Fig. 34. *Ormosia (Ormosia) suffumata* sp.n.; venation.

Fig. 35. *Ormosia (Ormosia) hallahani* sp.n.; male hypopygium.

Fig. 36. *Ormosia (Ormosia) megarhabda* sp.n.; male hypopygium.

Fig. 37. *Ormosia (Ormosia) libella* sp.n.; male hypopygium.

Fig. 38. *Ormosia (Ormosia) suffumata* sp.n.; male hypopygium.

(Symbols: *a*, aedeagus; *b*, basistyle; *db*, dorsal lobe of basistyle; *g*, gonapophysis; *id*, inner dististyle; *od*, outer dististyle; *t*, tergite; *vb*, ventral lobe of basistyle.)

vein *2nd A*; veins brown, more yellow in prearcular field and at base of *Sc*. Trichia of cells abundant, more sparse or lacking in bases of cells *Cu*, *1st A* and *2nd A*. Venation: *Sc*<sub>2</sub> nearly opposite midlength of *Rs*; cell *1st M*<sub>2</sub> closed; *m-cu* about one-third to one-fourth its own length beyond fork of *M*; anal veins divergent.

Abdomen black, sparsely pruinose; hypopygium black. Male hypopygium (Fig. 35) with the extensive median lobe of tergite, *9t*, broadly depressed, weakly bilobed at apex. Basistyle, *b*, deeply bilobed into a ventral, *vb*, and a dorsal, *db*, lobe, with the two dististyles arising from this notch. Outer dististyle, *od*, very large and massive, unequally bilobed, the major outer lobe very large and massive. Inner dististyle, *id*, slender, the basal half stouter, the distal half narrowed into a long slender spine. Gonapophyses, *g*, appearing as flattened spinous blades. Aedeagus slender, straight, terminating in a small bell-shaped cap.

*Holotype*, ♂, Gothic, 9,500 ft., July 13, 1934 (Alexander). Associated with *Elliptera coloradensis* Alexander and *Erioptera (Ilisia) hygroptetrica* sp. nov., as discussed earlier in the present report.

*Ormosia (Ormosia) hallahani* is named in honor of Mr. John D. Hallahan, to whom I am greatly indebted for numerous specimens of Tipulidae from the Gothic Area. The species is quite distinct from certain other approximately similar regional species, as *O. (O.) fumata* (Doane, 1900) and *O. (O.) bifidaria* Alexander, 1919, being more closely related to a group of species hitherto believed to be restricted to the eastern Palaearctic region, including *O. (O.) cata* Alexander, 1940, *O. (O.) deprava* Alexander, 1941, and *O. (O.) prava* Alexander, 1940, all of Japan and northern Korea.

*Ormosia (Ormosia) bifidaria* Alexander, 1919.—Gothic, 9,500 ft., July 2, 1934; trail to Emerald Lake, 10,100 ft., along a small mountain stream.

*Ormosia (Ormosia) libella* sp. nov. — Belongs to the *fumata* group; mesonotal praescutum gray, with three brown stripes; femora and tibiae obscure yellow, their tips weakly darkened; wings whitish subhyaline, stigma brown; anal veins convergent, *2nd A* strongly sinuous; male hypopygium with the outer dististyle only weakly expanded outwardly, the apex scarcely emarginate, provided with abundant blackened spinous points; gonapophyses with the outer spines relatively slender, strongly curved, the inner spine long and nearly straight; apical arms of aedeagus unusually short and relatively inconspicuous.

♂. Length, about 5.5-6 mm.; wing, 6.65 mm.; antenna, about 1.5 mm.

Rostrum brownish gray; palpi dark brown. Antennae of moderate length, brownish black throughout; flagellar segments passing through long-oval to elongate; longest verticils slightly exceeding the segments. Head dark gray.

Pronotum brownish gray; pretergites conspicuously yellow. Mesonotal praescutum gray with three brown stripes, the median one especially broad and

conspicuous; pseudosutural foveae black; scutum gray, each lobe with two poorly marked brown areas; posterior portion of scutal lobes and the scutellum obscure orange, parascutella dark; postnotum gray. Pleura gray. Halteres pale yellow throughout. Legs with the fore coxae brownish gray, middle and posterior coxae more yellowish; trochanters yellow; femora and tibiae obscure yellow, the tips weakly darkened; tarsi dark brown. Wings (Fig. 33) whitish subhyaline to weakly tinged with brown; stigma brown; a poorly indicated darkening on anterior cord; veins brown, those in prearcular field more yellow. Macrotrichia of cells numerous and well-distributed. Venation:  $R_{2+3}$  subequal to  $R_2$  alone; vein *2nd A* strongly sinuous.

Abdominal tergites brownish gray, basal sternites somewhat brightened; subterminal segments more uniformly dark brown; hypopygium yellow, the basistyles weakly darkened. Male hypopygium (Fig. 37) with the outer dististyle, *od*, pale, darkened apically, the outer portion weakly expanded but scarcely emarginate, the margin provided with very abundant blackened spinous points. Inner dististyle flattened, narrowed to the subobtuse apex. Gonapophyses, *g*, with the outer spine relatively slender, curved more or less strongly to a long straight point; inner spine long and nearly straight, subtending the aedeagus. Aedeagus, *a*, with the apical arms unusually short and relatively inconspicuous.

*Holotype*, ♂, Gothic, 10,100 ft., July 12, 1934, along small mountain stream (Alexander). *Paratopotypes*, 2 ♂♂; *paratypes*, 9,500 ft., 2 ♂♂, July 3, 1934; 1 ♂, July 18, 1934.

*Ormosia (Ormosia) libella* is readily told from the other species that are allied to *fumata* (Doane) by the structure of the male hypopygium. The short apical arms of the aedeagus are more as in *O. (O.) garretti* Alexander, 1926, than in *O. (O.) bifidaria* Alexander, 1919; *O. (O.) fumata* (Doane, 1900) or *O. (O.) suffumata* sp. nov.

*Ormosia (Ormosia) suffumata* sp. nov. — Belongs to the *fumata* group; general coloration of thorax yellow, the dorsum patterned with brownish gray, including four virtually confluent praescutal stripes; pleura not or but feebly darkened; halteres uniformly pale yellow; wings with a weak brown tinge, the prearcular and costal fields more yellow; stigma and a restricted seam along cord darker brown; vein *2nd A* strongly sinuous; male hypopygium with the outer dististyle conspicuously dilated at apex; gonapophyses appearing as flattened blades, each bearing two unequal spines; apical lobes of aedeagus long and gently sinuous.

♂. Length, about 5.3-5.5 mm.; wing, 6-6.2 mm.

Rostrum obscure yellow; palpi brown. Antennae with the basal three segments yellow, the succeeding ones passing into brown; flagellar segments oval to long-oval. Head uniformly gray.

Pronotum brownish gray, obscure yellow medially behind. Mesonotal

praescutum with the humeral and lateral portions yellow, the disk chiefly covered by four more brownish gray stripes that are virtually confluent, obliterating the posterior interspaces or nearly so; tuberculate pits black, conspicuous, pseudosutural foveae more reddish brown; scutal lobes brownish gray, the median area paler; scutellum obscure yellow; postnotum brownish gray. Pleura variegated yellow and pale brownish gray, the latter color sometimes lacking, in other cases involving the mesepisternum and meron. Halteres pale yellow. Legs with the coxae and trochanters yellow; femora obscure yellow, the tips not or scarcely darkened; tibiae and basitarsi yellow, their tips pale brown; remainder of tarsi black. Wings (Fig. 34) with a weak brown tinge, the prearcular and costal fields more yellow; stigma and a restricted seam along cord darker brown; veins brown, paler in the flavous areas. Macrotrichia of cells abundant and distributed over the entire wing excepting the extreme basal portions of cell *Cu*. Venation: Vein 2nd *A* strongly sinuous, on distal third or more paralleling the posterior margin of wing. In one wing of a paratype, *m* is atrophied so that cell  $M_2$  is open.

Abdominal tergites dark grayish brown, the sternites and outer two segments yellow. Male hypopygium (Fig. 38) as in the *fumata* group. Outer dististyle, *od*, widely dilated apically, with rows of abundant blackened setae or short spines. Gonapophyses, *g*, appearing as flattened blades, the mesal portion of each produced into a long curved spine, the outer angle into a shorter acute spinous point. Apical lobes of aedeagus, *a*, long and gently sinuous.

*Holotype*, ♂, Peaceful Valley, Boulder Co., Colorado, August 25, 1918 (T. D. A. Cockerell). *Paratopotypes*, 3 ♂♂, August 25, 1918; August 1919 (T. D. A. Cockerell).

Although the present species has not been taken in the Gothic Area it is included herewith in order to add to the data regarding the *fumata* group. The fly has long been confused in my collection with *Ormosia* (*Ormosia*) *fumata* (Doane, 1900), of the north-central Rocky Mountain region, which is now known to differ in coloration and in the structure of the male hypopygium. I am greatly indebted to Dr. Alan Stone, of the United States National Museum for mounting the male hypopygium of the type of *fumata*; this shows the details of the hypopygium, especially the gonapophyses, to be quite distinct from those of the present fly.

*Ormosia* (*Ormosia*) *cockerelli* (Coquillett, 1901).—Gothic, 9,800-10,100 ft., July 3-12, 1934.