

**Records and Descriptions of North American  
Crane-Flies (Diptera) Part IV. Tipuloidea  
of the Yellowstone National Park**

**CHARLES P. ALEXANDER**



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

## Part IV. Tipuloidea of the Yellowstone National Park

Charles P. Alexander

### General Account

The Yellowstone National Park lies principally in northwestern Wyoming, with slight encroachments upon Idaho and Montana, forming a roughly rectangular area having a total of 3472 square miles, or approximately 2,222,000 acres. The central portion of the park is essentially an elevated volcanic plateau with an average altitude of between 7,000 and 8,000 feet, with several peaks, including Mount Washburn, exceeding 10,000 feet. Approximately four-fifths of the total park area is forested, almost entirely by coniferous tree types, particularly pines. About three-fourths of the tree population consists of lodgepole pine, *Pinus murrayana* Balf., the remainder chiefly of whitebark pine, *Pinus albicaulis* Engelm., alpine fir, *Abies lasiocarpa* (Hook.) Nutt., and Engelmann spruce, *Picea engelmannii* (Parry) Engelm., at the higher levels; and limber pine, *Pinus flexilis* James, Colorado Douglas fir, *Pseudotsuga glauca* Mayr, and Rocky Mountain red cedar, *Juniperus scopulorum* Sarg., at somewhat lower elevations. The most common deciduous tree in the park is the quaking aspen, *Populus tremuloides* Michx.

The continental divide extends from the Montana-Idaho border at the west of the park diagonally and irregularly southeastward to near the southeastern corner of the area, passing just to the south of the Lone Star geyser, near Old Faithful. Thus virtually all of the species of Tipuloidea recorded herein were taken to the east of the divide, the only exceptions being such materials as were taken at Lewis Lake and southward along the Lewis River. The peculiar system of drainage in the park and adjacent regions is well expressed by Disterdick (in Climate and Man, p. 1209; 1941):

The drainage of Wyoming is remarkable in that its waters flow in practically every direction, and tributaries of three great river systems have their sources in a rather limited area in the northwest part of the State. The Green River, a tributary of the Colorado, has its source in the northern part of Sublette County, and flows into the Gulf of California. The Snake River has its source in the area adjacent to the southern part of Yellowstone Park and the western slopes of the Wind River and Gros Ventre mountain ranges; it is a tributary of the Columbia. The Missouri and the Yellowstone

<sup>1</sup> The preceding part under this general title was published in the American Midland Naturalist 29:147-179; 1943.

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

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

Rivers have their sources in Yellowstone Park, and the Big Horn, a tributary of the Yellowstone, has its source on the east slope of the Wind River and Absaroka mountain ranges; all these streams are a part of the Mississippi River system.

The main scenic attractions of the park, including the marvellous series of geysers, hot springs, mud volcanoes, and paintpots; the Grand Canyon of the Yellowstone River with its magnificent waterfalls; Yellowstone and other major lakes; and the preserves of mammals and birds, all are known so well that they are not further mentioned in the present report. In addition to the larger lakes of the park, there are rather numerous smaller lakes and ponds throughout the area. Sphagnum bogs, with sundews and other characteristic oxylophytic plants occur but do not seem to be common. The lakes and rivers are fed by smaller streams and brooks, many of the latter winding through the lodgepole pine forests and out into open meadows that support a rich and varied herbaceous flora. Most of the crane-flies discussed in the present paper were taken by sweeping the vegetation along the smaller streams such as described.

In such a varied ecological habitat one would expect to find a rich crane-fly fauna and this has proved to be the case. It is surprising that up to the present moment there is scarcely a single published reference to the crane-flies of the Yellowstone, and, further, that there have been only a very few specimens of these flies preserved in the major museums and public collections. Small series that have generously been given to me include materials taken by Dr. M. D. Leonard in Gibbon Canyon, July 1929; and others taken by Professor G. F. Knowlton and Mr. H. F. Thornley in September 1941. The chief collections available for the present study were those made by the author and Mrs. Alexander in 1934, 1941 and 1942, including some thousands of specimens representing approximately 80 species. Virtually all of this material was taken between the dates of June 21 and July 14, representing the early season fauna, with the result that the late season species are still poorly known. It is probable, however, that there does not exist such a striking difference between the spring and fall species as is found in northeastern North America, for example, where the crane-flies occurring in June are almost entirely different from those species on the wing in late August and September.

*Life Zones.*—Of the seven life zones or faunal areas commonly differentiated in North America, four are found within the park limits, as follows:

Transition (Foothills). Occurs in limited areas in the low-lying valleys up to approximately 7,500 feet on the southwestern slopes, 6,500 on the colder northeastern slopes.

Canadian (Montane). This covers most of the park between 7,500 and 9,000 feet on the southwestern slopes, and 6,500 and 8,000 feet on the northeastern ones. It includes the general plateau level of the park, with the chief forested areas, all the major lakes, the three great geyser basins, and the Grand Canyon of the Yellowstone. Most of the crane-fly collecting done by the writer was in this zone.

Hudsonian (Subalpine). Restricted to narrow belts of scrubby tree growth

immediately below timberline on the higher peaks and ridges. It is rarely more than 1,000 feet in vertical extent, occurring between 9,000 and 10,000 feet on the warmer southwestern exposures, and between 8,000 and 9,000 feet on the cold northeastern slopes.

Arctic-Alpine (Alpine). Occurs above extreme timberline on the highest peaks and ridges, above 10,000 feet on warm sunny exposures, above 9,000 feet on cold shaded slopes.

(References to life zones of Yellowstone: Bailey, 1930: 9-15; Cary, 1917; Skinner, 1925. The Bailey and Cary references are accompanied by colored life zone maps and are particularly useful.)

By Fenneman's classification (1931) of the United States into physical divisions, the Yellowstone falls chiefly in the Middle Rocky Mountain Province, the extreme northwestern section in the Northern Rocky Mountain Province, both of the Rocky Mountain System. By Mulford's division of the United States into plant-growth regions (Van Dersal, 1938: 16-27, map), the area falls in Region 12, the Northern Rocky Mountains.

*Collecting Stations.*—In 1941, the writer and Mrs. Alexander, with the co-operation of Mr. and Mrs. Walter H. Harrison, of Amherst, Massachusetts, established seven stations distributed throughout the park that were made the basis for special study of the Tipulidae. These collections were made between June 21st and 30th and represent the early spring fauna, particularly at the higher altitudes. In 1942, Mrs. Alexander and I again collected in the park but due to a serious foot injury incurred earlier, collecting was greatly hampered and the results were scarcely satisfactory. The 1942 series was taken between July 10th and 13th and it was anticipated that this slightly later date over the collections of the preceding year would show a marked change in the crane-fly fauna of the various stations. However, in 1941 the season was advanced whereas in 1942 conditions were notably retarded, with the result that virtually the same crane-fly species were on the wing on July 12, 1942, as on June 30, 1941. The seven base stations established in 1941 are as follows:

1. Sylvan Lake and vicinity, altitude 8,000 feet, June 21, 1941. Collections made in the lodgepole forests, here intermixed with fewer Engelmann spruce. Conditions definitely early spring, with large patches of snow persisting in the nearby woods and with extensive beds of snow lily, *Erythronium parviflorum* (Wats.) Good, in full flower near by. Collections made in a swale where small mountain streams had ramified and produced an extensive swampy area, with many signs of elk and mule deer. Labelled "Sylvan Lake"; in 1942, a further brief survey of the area was made on July 13th.

2. Canyon Camp, altitude 7,800 feet; and about the Upper and Lower Falls of the Yellowstone River, as low as 7,500 feet; June 20 and 22; not duplicated in 1942. Forest almost entirely of lodgepole pine.

3. Tower Falls, collections made in wet swales along Tower Creek, above the falls, altitude 6,500 feet, June 23, 1941; further collections in the great gorge at the foot of Tower Falls, altitude about 6,200 feet, June 23, 25 and

26, 1941; not duplicated in 1942. This latter station is one of unusual interest although rather difficult to collect. Talus slopes at the foot of the falls mount the cliffs to a height of 100 feet or more, densely covered with herbaceous vegetation, including many grasses, *Heracleum lanatum* Michx., *Ranunculus* spp., and others. Numerous springs and small streamlets flow down these talus slopes where this is constantly in the spray of the falls, at this season a distance of some 200 to 250 feet from the base. Labelled "Tower Falls."

4. Northeast Entrance; near Silver Gate, Montana; just inside the park boundaries but in Montana; altitude 7,200 feet; collections made June 24 and 26, 1941, chiefly along small mountain streams flowing down the mountain sides into Soda Butte Creek. Above the highway these streams are very steep and rapid-flowing; near the major creek they flow through wet meadows, providing fine collecting; not duplicated in 1942. Station within one mile of park boundary, near Amphitheatre and Abiathar Mountains; forest cover chiefly Engelmann spruce and alpine fir, with some Siberian juniper, *Juniperus communis montana* Ait. Floor plants include *Smilacina stellata* (L.) Desf.; *Linnaea borealis americana* Forbes, great beds, still in bud; *Thalictrum occidentale* Gray, and many others. Labelled "Northeast Entrance."

5. Obsidian Creek; some 300 yards north of Obsidian Cliff and directly beneath the northward extension of the same; altitude 7,300 feet; June 27; 1941; repeated July 11, 1942. Stream banks shaded with Engelmann spruce, alpine fir and some Siberian cedar; herbage consisting of dense growth of *Equisetum arvense* L., *Smilacina stellata*; *Aquilegia flavescens* Wats.; *Thalictrum occidentale*, and abundant reeds and rushes. Labelled "Obsidian Creek."

6. Elk Park, near Gibbon Meadow, altitude 7,000 feet; June 28, 1941; repeated July 11, 1942. Along trail to the Artists Paintpots from Gibbon Meadows. Collecting done along a small stream and in the adjacent wet areas, in a sparse open forest of lodgepole pine. The extensive wet flats chiefly covered with sedges and similar growth but with numerous large areas of *Pedicularis groenlandica* Retz., just coming into flower; less abundant *Limnorchis borealis* (Cham.) Rydb., and a yellow *Castilleja*, both in full flower; much *Smilacina stellata*. Along the actual stream, in very wet spots, abundant *Triglochin palustris* L. and *Mimulus Langsdorfii* Sims., the latter in full flower and very conspicuous. In places, young plants of *Heracleum lanatum*; on the higher knolls about the bases of the pines, beds of *Cornus canadensis* L., still chiefly in bud. Labelled "Elk Park."

7. Emerald Pool, Black Sand Geyser Basin; altitude 7,275 feet, June 29 and 30, 1941; repeated July 10 and 12, 1942. Remarkably fine collecting along a small brook flowing into Iron Creek, a branch of the Firehole River; near the Emerald Pool and only about two miles from Old Faithful Geyser. The small stream winds through an open woodland of lodgepole pine, with a rich vegetation of shrubs and herbs, including an unusually abundant and fine display of *Ledum glandulosum* Nutt., in full bloom. Other plants from which Tipulidae were swept included *Triglochin palustris*, *Camassia esculenta* Lindl., *Eriophorum ocreatum* A. Nels., *Limnorchis borealis*, *Thalictrum occidentale*, *Actaea arguta* Nutt., *Geranium Richardsonii* F. & M., *Veronica ameri-*

*cana* Schwein., in stream, *Mimulus Langsdorffii*, *Pedicularis groenlandica*, a red species of *Castilleja*, *Cicuta occidentalis* Greene, *Heracleum lanatum*, *Senecio serra* Hook., and others. The actual stream was almost choked with *Batrachium flaccidum* (Pers.) Rupe., and with abundant surface growth of *Lemna trisulca* L. In the more boggy areas, *Eriophorum* and abundant *Drosera longifolia* L. The small brook has many springs and lateral runlets that spread out over an extensive area and provide rich Tipulid collecting. Some further materials were taken by following a small creek up the mountainside to an altitude of about 7,400 feet. All collecting was done within 200 yards of Emerald Pool, south and west. On July 12, 1942, while collecting all afternoon, there were numerous elk watching from a short distance away. This station proved to be the richest and most interesting of any of those investigated within the park limits and well deserves still further study. Labelled "Emerald Pool."

Bear Tooth Mountains. Although lying just outside the park limits, along the Wyoming-Montana border to the northeast of the area, it is deemed advisable to include some discussion of the Tipulidae of the station since it adds materially to our knowledge of the high-altitude species of the north-central Rocky Mountains. Our party visited the station on June 24, 1941, driving over the beautifully graded high mountain road between Silver Gate, near the northeast park entrance, almost to Red Lodge, Montana. The road follows the crest of the Bear Tooth Range, winding between numerous alpine tarns and great snow masses (at this date); in two places the road reaches altitudes of 10,924 and 10,942 feet, respectively. At the time of our visit conditions were still far too early for any crane-flies but in August 1941 and again in 1942, representative collections at these high altitudes were made by our friends, Mr. and Mrs. John L. Sperry, of Riverside, California. Such specimens were taken chiefly at Quad Creek, 10,000-10,500 feet, for the most part in open mountain meadows where they were flying among and alighting upon the stunted alpine willows or flying among the dried-up grass on the mountainside. A discussion of these crane-flies, representing the highest Hudsonian or low Arctic-Alpine zones, will be found under *Tipula* (*Oreomyza*) *neptun* Dietz, *T. (Lunatipula) sperryana* Alexander, *T. (L.) dens-ursi* sp. nov., and *T. (L.) satyr* Alexander. Labelled "Bear Tooth Mountains."

I wish to express my deepest appreciation to Mrs. Alexander and to Mr. and Mrs. Harrison and Mr. and Mrs. Sperry, for their invaluable assistance in the collecting of Tipulid materials. I am further indebted to Dr. Harlow B. Mills, State Entomologist of Montana, former assistant Park Naturalist of the Yellowstone, and to Dr. C. Max Bauer, Park Naturalist, for advice concerning collecting localities and similar information.

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### Systematic Account

#### PTYCHOPTERIDAE

*Ptychoptera lenis* Osten Sacken, 1877.—Obsidian Creek, 7,300 ft., June 27, 1941; Emerald Pool, 7,275 ft., June 29-30, 1941.

*Ptychoptera pendula* Alexander, 1937.—Swales near Northeast Entrance, 7,200 ft., June 24 and 26, 1941; Emerald Pool, 7,275 ft., June 29-30, 1941.

#### TIPULIDAE

#### TIPULINAE

*Prionocera primoveris* sp. nov.—Size small (wing, male, 11 mm. or less); mesonotal praescutum dark gray, with four ill-defined darker brownish



gray stripes that are narrowly and insensibly bordered by darker; pleura light gray; femora obscure brownish yellow, the tips rather narrowly brownish black, the amount subequal on all legs; wings with a weak brownish tinge; male hypopygium with the lateral tergal lobes very slender, yellow; caudal emargination produced into two flattened plates, the outer angles directed laterad into stout lobes, the mesal angles produced caudad into a slender glabrous arm; inner dististyle relatively narrow.

♂. Length, about 9-10 mm.; wing, 10.5-11 mm.; antenna, about 2.8-3.2 mm.

♀. Length, about 13 mm.; wing, 11.5-12 mm.

Rostrum entirely black; palpi black. Antenna relatively short, black throughout, the segments more or less pruinose; flagellar segments unusually short, subtriangular, producing only a weakly serrate effect; terminal (13th) segment abruptly reduced in thickness, as common in the genus. Head dark gray, the orbits narrowly light gray; anterior vertex wide, the eyes correspondingly small.

Pronotal scutum dark gray, the scutellum and pretergites abruptly light yellow. Mesonotal praescutum dark gray, with four ill-defined darker brownish gray stripes that are narrowly and insensibly bordered by darker; posterior sclerites of notum gray, the centers of the scutal lobes brown, not contrasting strongly against the ground; parascutella restrictedly yellowish on either side of scutellum, the remainder brown. Pleura light gray; dorsopleural membrane weakly infuscated. Halteres obscure yellow, the knob and outer face of stem dark brown. Legs with coxae light gray; trochanters yellow; femora obscure brownish yellow, the tips rather narrowly brownish black, the amount subequal on all legs and including the distal sixth to eighth of segment; tibiae dark brown, the tips still darker; tarsi black. Wings (Fig. 1) with a weak brownish

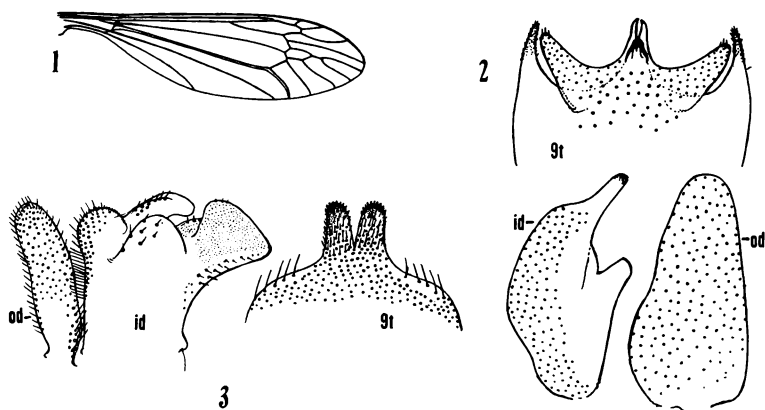


Fig. 1. *Prionocera primoveris* sp.n.; venation. Fig. 2. *Prionocera primoveris* sp.n., male hypopygium. Fig. 3. *Tipula (Yamatotipula) colteri* sp.n.; male hypopygium. (Symbols: *id*, inner dististyle; *od*, outer dististyle; *t*, 9th tergite.)

tinge, the stigma faintly darker, more or less bicolored, its proximal half paler than the outer portion; veins brown, Sc and prearcular veins yellow. Veins beyond cord virtually without trichia, there being none on  $R_{2+3}$ ,  $R_{1+2}$ ,  $R_3$ , or outer medial branches; a few scattered trichia on outer section of  $R_{4+5}$ . Venation:  $R_5$  relatively long, much exceeding  $R_3$ ; cell  $M_4$  long and narrow, gently widened outwardly.

Abdomen dark gray, the lateral tergal borders broadly buffy, the extreme caudal margins similarly pale; hypopygium dark, the outer dististyle obscure brownish yellow. Male hypopygium with the tergite (Fig. 2, 9t) elongate, the lateral angles produced caudad into very slender yellow lobes that are provided with microscopic setulae; inside the outermost lobes with two flattened plates, the outer portions of which are directed laterad into stouter lobes, the mesal portion directed caudad into a slender glabrous lobe, on the median line almost touching its mate of the opposite side. Outer dististyle, *od*, relatively broad, more narrowed and obtuse at apex. Inner dististyle, *id*, relatively narrow as compared with other species.

*Holotype*, ♂, Sylvan Lake, Yellowstone, altitude 8,000 ft., June 21, 1941 (C. P. Alexander). *Allotype*, ♀, Twogwotæe Pass, Grand Teton National Forest, Wyoming, 9,650 ft., July 9, 1942 (C. P. Alexander). *Paratopotype*, 1 ♂; *paratypes*, 7 ♂ ♀, with the allotype.

*Prionocera primoveris* is very different from the other regional species of the genus, differing especially in the short, triangular flagellar segments and in the structure of the male hypopygium, more especially of the tergite.

*Nephrotoma lugens erythrophrys* (Williston, 1893).—Yellowstone, July 14, 1930 (Amer. Mus. Nat. Hist., No. F. 300,714).

*Tipula* (*Schummelia*) *subtenuicornis* Doane, 1901.—Tower Falls, 6,500 ft., June 23 and 25, 1941; Obsidian Creek, 7,300 ft., June 27, 1941.

*Tipula* (*Yamatotipula*) *albocaudata* Doane, 1901.—Obsidian Creek, 7,300 ft., June 27, 1941.

*Tipula* (*Yamatotipula*) *continentalis* Alexander, 1941.—Tower Falls, 6,200 ft., abundant, June 26, 1941.

*Tipula* (*Yamatotipula*) *colteri* sp. nov.—Allied to *tephrocephala*; general coloration of mesonotum gray, the praescutum with three grayish brown stripes that are heavily bordered by blackish, the median stripe not or scarcely divided by a median vitta; antennae (male) relatively long, flagellum uniformly black; wings with a dusky tinge, stigma relatively small, brown; a brown seam in cell *M* adjoining vein *Cu*, continued over *m-cu*; male hypopygium with the paired tergal lobes entirely blackened, relatively short, the dorsal surface with conspicuous black setae throughout the length; inner dististyle complex, the beak subtriangular in outline, with almost the whole surface covered with microscopic setulae.

♂. Length, about 15-16 mm.; wing, 16-17.5 mm.; antenna, about 6.7-7 mm.

♀. Length, about 19-20 mm.; wing, 19-22 mm.; antenna, about 3.3 mm.

Frontal prolongation of head reddish brown, restrictedly variegated above and on sides by dark brown; nasus elongate; palpi black. Antennae of male elongate, of female much shorter; scape and pedicel reddish brown, flagellum black; flagellar segments (male) rather strongly incised; longest verticils shorter than the segments. Head brownish gray, clearer gray on front and orbits; vertex with a more or less distinct dark brown median vitta.

Pronotum dark reddish brown medially, brownish gray on sides; scutellum with a small yellow spot on either side; pretergites brownish gray. Mesonotal praescutum gray, with three more grayish brown stripes that are heavily bordered by blackish; median stripe relatively broad, not or only vaguely split by a dark median vitta; scutum gray, each lobe with two dark brown areas; scutellum and postnotum light gray, with vague indications of a capillary darker vitta; parascutella dark; lateral borders of mediotergite and much of katapleurotergite yellow. Pleura clear gray; dorsopleural membrane brownish yellow. Halteres with stem light brown, knob brownish black. Legs with coxae light gray; trochanters light brown; femora light brown, with rather narrowly blackened tips, the amount subequal on all legs; tibiae and basitarsi brown, their tips blackened; remainder of tarsi black. Wings with a dusky tinge, the prearcular and costal fields more brownish yellow; stigma relatively small, brown; a conspicuous brown seam along *m-cu* and vein *Cu* in cell *M*<sub>1</sub>; a dark seam on anterior cord; other dusky clouds in cephalic portion of cell *R* and in outer radial field; obliterative areas before stigma and across base of cell *1st M*<sub>2</sub> restricted; base of cell *R*<sub>2</sub> slightly paler; veins brownish black, brighter in the paler costal and prearcular areas. Venation: *Rs* about twice *m-cu*; *M*<sub>3+4</sub> subequal to or much shorter than the basal section of *M*<sub>1+2</sub>.

Basal abdominal tergites yellow, the outer segments more obscure brownish yellow; a conspicuous black sublateral stripe on either side, widened on posterior segments; outer segments, including most of hypopygium, blackened, sparsely pruinose; outer dististyle pale; basal sternites more uniformly obscure yellow. Ovipositor with cerci long and slender, nearly straight. Male hypopygium (Fig. 3) with the tergal lobes, *9t*, entirely blackened, provided with abundant black spines at and near tip, together with conspicuous black setae on the entire remainder of dorsal surface. In *albocaudata*, the lobes are longer and more slender, blackened and provided with sparse black spines only at tips, the remainder of surface yellow and almost destitute of setae. Outer dististyle, *od*, relatively long and narrow, only a little widened at about midlength, the tip obtuse. Inner dististyle, *id*, complex, broad-based, the beak subtriangular in outline, provided with microscopic setulae over the entire surface excepting only the extreme margins; in addition to a flattened dorsal blade, there is a third flattened blade or flange on the face of the style. In *albocaudata*, the outer dististyle is strongly dilated at near midlength, the outer margin being strongly sinuate; beak of inner dististyle narrower and more elongate, the surface almost glabrous; dorsal blade of style very small, on its outer portion bearing a further flange or crest; the blade found on the face of the style in *colteri* is here not so clearly developed.

*Holotype*, ♂, Sylvan Lake, Yellowstone, 8,000 ft., June 21, 1941 (C. P. Alexander). *Allotopotype*, ♀, pinned with type. *Paratopotype*, 1 ♂; *paratypes*, 15 ♂ ♀, Robson, British Columbia, 1,700 ft., May 9-23, 1937 (H. Foxlee). The series of paratypes agrees closely with the types and are considered to be conspecific.

Named for John Colter (1775-1813), the first white man to see either the Tetons or the Yellowstone. Colter was a member of the Lewis and Clark Expedition, 1803-1806. During the winter of 1807-1808, Colter, alone, with a thirty pound pack and rifle, travelled on snowshoes for more than 500 miles through the Absarokas, Jackson Hole, Tetons and the Yellowstone.

The nearest relative is *Tipula (Yamatotipula) albocaudata* Doane, 1901, which also occurred in Yellowstone as discussed elsewhere. The differences between the two flies include the structure of the antennae and male hypopygium, as well as the coloration of the praescutum and wings.

*Tipula (Yamatotipula) tephrocephala* Loew, 1864.—Emerald Pool, 7,275 ft., June 30, 1941. This is the first record of occurrence of this eastern species in the west.

*Tipula (Bellardina) subcinerea* Doane, 1901.—Gorge at base of Tower Falls, 6,200 ft., June 25 and 26, 1941 (M. M. Alexander); a few swept from dense coniferous growth.

*Tipula (Vestiplex) leucophaea* Doane, 1901.—Obsidian Creek, 7,300 ft., June 27, 1941 (W. H. Harrison); Tower Falls, 6,500 ft., June 23, 1941. This material agrees well with specimens from Colorado determined as being of this species except that the dark clouds on the wings are more extensive and slightly more intense, far exceeding in area the intervening whitish ground pattern. Antennae (male) much longer than in female; basal flagellar segments very weakly bicolored, the outer ones uniformly black; segments rather strongly incised.

*Tipula (Oreomyza) absaroka* sp. nov.—General coloration gray, the praescutum with four entire dark brown stripes; antennae (male) relatively short, scape obscure brownish yellow, remainder of organ black; anterior vertex broad, eyes relatively small; knobs of halteres dark brown; femora obscure brownish yellow, the tips narrowly blackened; claws (male) simple; wings with a strong brownish tinge, stigma darker brown; restricted obliterative areas before stigma and across cell 1st  $M_2$ ; abdominal tergites plumbeous gray, in male with a narrow obscure orange median stripe on segments two to four inclusive; in female, this stripe even longer and more conspicuous; ovipositor with long cerci; male hypopygium of unusually simple structure; ninth tergite nearly truncate across the caudal border, with a very small median notch; outer dististyle broadly flattened; inner dististyle simple; eighth sternite unarmed.

♂. Length, about 12-14 mm.; wing, 12-15 mm.; antenna, about 3-3.5 mm.

♀. Length, about 14-20 mm.; wing, 12-14 mm.

Frontal prolongation of head relatively short and stout, dark brown above, paler brown on sides; nasus conspicuous; palpi black. Antennae relatively short in both sexes, shorter in female; scape obscure brownish yellow, remainder of organ black; flagellar segments (male) short and crowded, moderately incised, the basal swelling shorter than the outer one; verticils shorter than the segments. Head gray, a little darker on the low vertical tubercle; eyes small, the anterior vertex correspondingly wide, approximately four times the diameter of scape.

Pronotum dark gray. Mesonotal praescutum light gray laterally, with four entire dark brown stripes, the intermediate pair separated by a capillary gray line; posterior interspaces more brownish yellow, with short yellow setae; posterior sclerites of notum light gray, each scutal lobe with two confluent dark brown areas; scutellum and mediotergite with indications of a capillary darker median vitta. Pleura light gray; dorso pleural membrane extensively buffy yellow. Halteres with stem obscure brownish yellow, knob dark brown. Legs with coxae light gray; trochanters obscure yellow; femora obscure brownish yellow, the tips narrowly blackened, more gradually and extensively so on the fore pair; tibiae black, obscure yellow basally; tarsi black; tibial spur formula 1-2-2; claws simple. Wings (Fig. 4) with a strong brownish tinge, the costal and prearcular fields more yellowish; stigma oval, darker brown; restricted whitish obliterative areas before stigma and again across the base of cell *1st M*<sub>2</sub>, barely entering cell *M*<sub>3</sub>; no post-stigmal brightening; in cases, certain of the cells, especially in outer medial field, with pale centers; veins brownish black, more yellowish brown in the brightened fields. Squama naked; veins *R*<sub>4+5</sub> and outer branches of *M* with rather numerous macrotrichia. Venation: *R*<sub>s</sub> relatively long, from one-third to one-half longer than *m-cu*; *R*<sub>1+2</sub> entire; cell *1st M*<sub>2</sub> relatively small; *m-cu* at or close to fork of *M*<sub>3+4</sub>.

Basal abdominal tergite plumbeous gray; on succeeding segments gray

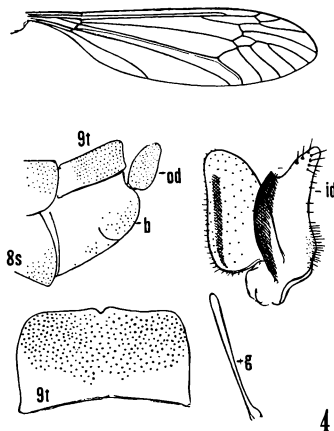


FIG. 4. *Tipula (Oreomyza) absaroka* sp.n.; male hypopygium. (Symbols: g, gonapophysis; id, inner dististyle; od, outer dististyle; t, 9th tergite.)

with an obscure orange median stripe that, in male, becomes obsolete about at the base of the fifth tergite; lateral tergal borders broadly obscure yellow, the extreme edges more whitened; outer segments more uniform brownish black, heavily pruinose; basal sternites suffused with reddish, the outer ones gray pruinose, with pale lateral borders; hypopygium brownish black. In female, the mid-dorsal yellow stripe is more conspicuous and continuous, extending from base of segment two to segment eight; genital shield brownish black. Ovipositor with cerci long, slender and nearly straight; hypovalvae shorter and more compressed. Male hypopygium (Fig. 4) of unusually simple organization, not enlarged. Ninth tergite separated from sternite by a complete suture; basistyle large, separated from ninth sternite by a ventral suture only. Ninth tergite, *9t*, large, transversely rectangular; caudal margin almost truncate, with a very small U-shaped median notch; caudal border of lobes blackened and microscopically corrugated. Outer dististyle, *od*, broadly flattened, provided with abundant short setae. Inner dististyle, *id*, unusually simple in structure, consisting of an elevated black dorsal crest and a simple beak that is provided with a few long setae. Gonapophyses, *g*, appearing as long and unusually slender spatulate rods. Eighth sternite, *8s*, unarmed.

*Holotype*, ♂, Twogwotee Pass, Grand Teton National Forest, 9,650 ft., July 9, 1942 (C. P. Alexander). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, numerous ♂ ♀; *paratypes*, ♂ ♀, Emerald Pool, Yellowstone, 7,275 ft., June 28-30, 1941, July 10 and 12, 1942; Grand Tetons, along Cascade Canyon trail, 8,500 ft., July 9, 1941 (C. P. Alexander), the latter in a small bog with much *Kalmia polifolia* Wang, *Menziesia ferruginea* Smith and *Phyllodoce empetriformis* (Smith) Don.

The nearest relative is *Tipula (Oreomyza) plutonis* Alexander, 1919, (Sequoia National Park, California, 9,000 ft.) which differs especially in the smaller size, distinct venational details, as the shorter *Rs* and petiole of cell *M*<sub>1</sub>, and the apparent obliteration of the pale central praescutal vitta to leave only three clearly defined praescutal stripes, the great reduction in amount of reddish color on the abdominal tergites, and slight differences in the male hypopygium. I am not entirely satisfied with the subgeneric reference of these two flies. The structure of the dististyles and gonapophyses is somewhat as in *Yamatotipula* but I hesitate to refer these flies to this subgenus.

*Tipula (Oreomyza) neptun* Dietz, 1921.—Numerous specimens at Quad creek, Bear Tooth Mountains, 10,000-10,500 ft., August 15-19, 1942 (J. L. & G. H. Sperry); associated with *Tipula (Lunatipula) dens-ursi* sp. nov., *T. (L.) satyr* Alexander and *T. (L.) sperryana* Alexander.

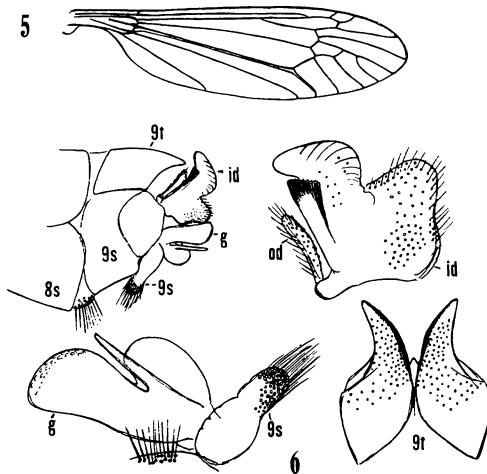
***Tipula (Lunatipula) dens-ursi* sp. nov.**—General coloration of mesonotum gray, the praescutum with three brown stripes; antennae (male) of moderate length; flagellum black, pedicel obscure brownish yellow; femora obscure reddish yellow, the tips narrowly blackened; claws weakly toothed and conspicuously hairy; wings with a brownish gray tinge, the oval stigma dark brown; abdomen reddish yellow, the tergites with a conspicuous median black

stripe; outer abdominal segments more uniformly blackened; male hypopygium with the ninth tergite deeply notched, the lateral lobes long and conspicuous, divergent, with a tiny median denticle at base of notch; basistyle large, complete; inner dististyle with outer basal lobe very short and wide, broadly joined to the main body of style; gonapophyses projecting conspicuously from the genital chamber as compressed-flattened blades; eighth sternite unarmed but with a loose median tuft of more than a score of setae arising from the membrane between the eighth sternite and ninth sternite.

♂. Length, about 15 mm.; wing, 14 mm.; antenna, about 5.5.1 mm.

Frontal prolongation of head uniformly dark brownish gray, clearer gray on dorsal portion; nasus conspicuous, tufted with yellow setae; palpi dark brown, the extreme apices of segments pale. Antennae (male) relatively long, about one-third the length of body or wing; scape light brown; pedicel obscure brownish yellow, narrowly darkened on basal portion; flagellum uniformly black; flagellar segments only gently incised, subequal in length to their longest verticils. Head dark gray, more infuscated on central portion of vertex, narrowly clearer gray on front and orbits.

Pronotal scutum dark gray, the scutellum yellow. Mesonotal praescutum gray with three entire brown stripes that are relatively inconspicuous against the ground; setae of praescutal interspaces pale and rather short; scutum with lobes extensively infuscated, the central area broadly gray, with a narrow median dark brown line that further involves the scutellum; posterior sclerites of notum light gray, the parascutella darker; pleurotergite with the katapleurotergite abruptly differentiated in color from the anapleurotergite, the cephalic



Figs. 5, 6. *Tipula (Lunatipula) dens-ursi* sp. n.; venation and male hypopygium. (Symbols: g, gonapophysis; id, inner dististyle; od, outer dististyle; s, sternite; t, 9th tergite.)

half whitish silvery, the posterior portion more bicolored, its dorsal section light brownish yellow, the ventral portion dark brown, sparsely pruinose. Pleura clear light gray, the ventral portion of dorsopleural membrane narrowly buffy, the dorsal portion gray pruinose. Halteres with stem obscure brownish yellow, knob darkened. Legs with coxae and trochanters brown, light gray pruinose; femora obscure reddish yellow, the tips narrowly blackened, the amount subequal on all legs; tibiae obscure yellowish brown, passing into black at tips; tarsi black; claws conspicuously hairy, with a low basal tooth; empodia long, conspicuously hairy. Wings (Fig. 5) with a strong brownish gray tinge; stigma oval, dark brown; veins brownish black. Squamal setae at least six in number; veins beyond cord with normally developed series of trichia; vein  $R_{1+2}$  with trichia on proximal half; no stigmal trichia. Venation:  $R_{1+2}$  deflected strongly cephalad on distal half, widening the cell; basal section of  $M_{1+2}$  longer than  $M_{3+4}$ ; petiole of cell  $M_1$  about one-third to one-half longer than  $m$ .

Abdominal tergites reddish yellow, with a conspicuous median black stripe that is narrowly interrupted on the posterior borders of the segments; sublateral stripes not or but vaguely indicated; basal sternites more uniform reddish yellow, on the sixth and succeeding segments more uniformly darkened, the other three segments black, segments six and seven with very narrow yellow posterior borders. Male hypopygium (Fig. 6) with the tergite entirely separate from the sternite. Basistyle,  $b$ , complete, unusually large, not produced at apex. Ninth sternite,  $9s$ , with no accessory sclerites cut off cephalad of basistyle. Ninth tergite,  $9t$ , with caudal border produced into two elongate, weakly divergent lobes or blades, separated by a very narrow V-shaped notch, at base of which is a very small, paler, chitinized denticle; lateral tergal lobes with their mesal edges more or less flattened and produced into a flange; dorsal surface of tergite with a deep and narrow furrow; cephalic border of sclerite deeply emarginate or notched, with pale membrane. Outer dististyle,  $od$ , small, weakly flattened and compressed, provided with relatively few setae. Inner dististyle,  $id$ , with apex of main body heavily blackened, the tip and dorsal border evenly rounded, without points or angles; outer basal lobe,  $obl$ , large and very broadly joined to the main body of style. Lobes of ninth sternite,  $9s$ , conspicuous, hanging pendant in the notch of sternite, the distal portion more blackened and bearing a dense brush of long yellow setae. Gonapophyses,  $g$ , appearing as unusually conspicuous flattened yellow blades that jut caudad from the genital chamber. Eighth sternite,  $8s$ , unarmored, not sheathing; in membrane between the eighth and ninth sternites a median area or loose tuft of more than thirty setae, directed chiefly ventrad, disposed in two more or less distinct subgroups.

*Holotype*, ♂, Bear Tooth Mountains, Montana; Quad Creek, 10 000 ft., August 13, 1942 (*J. L. & G. H. Sperry*); swept from among dwarf willows.

This very distinct species appears to be closest to *Tipula* (*Lunatipula*) *sperryana* Alexander, from exactly the same geographical and ecological situation. It differs from the latter in every regard of coloration, venation and structure of the male hypopygium. The four Arctic-Alpine species of *Tipula*



taken by Mr. and Mrs. Sperry at high altitudes in the Bear Tooth Mountains on the border of Wyoming and Montana present the best idea we have yet had of such a fauna. All four of the species of *Tipula* so taken are evidently adapted to an existence under high alpine conditions, occurring among the scrub willows and 'Krummholz' at these high altitudes.

*Tipula (Lunatipula) sperryana* Alexander, 1942.—The types were from Frozen Lake, 10,000 ft., in the Bear Tooth Mountains. Further material was taken in 1942 from this general vicinity, Quad Creek, 10,000-10,200 ft., August 13-19, 1942 (J. L. & G. H. Sperry). Further notes on the male hypopygium, and a description of the hitherto unknown female are given.

Male hypopygium (Fig. 7) with the ninth tergite, *9t*, entirely separated from the sternite. Basistyle, *b*, large, more or less distinctly separated from the sternite by a suture. Ninth tergite, *9t*, large and conspicuous, yellow, patterned with dark brown; broadest at base, narrowed outwardly, the caudal margin deeply emarginate, the lateral lobes produced into long, relatively narrow, pale blades, their tips narrowly obtuse to subacute, without conspicuous setae; at base of notch with a smaller slender median lobe that is densely covered with short erect setulae. Basistyle, *b*, at apex produced into a broad flattened blade, its tip obtuse. Outer dististyle, *od*, a conspicuous flattened spatula. Inner dististyle, *id*, with the main body large, compressed-flattened, the apex and dorsal crest evenly rounded; outer basal lobe, *obl*, very large and conspicuous, pale, of irregular conformation, provided with numerous strong setae from elevated basal tubercles. A close group of sensory pits near base of the outer lobe, immediately caudad of which is a conspicuous longitudinal row or group of more elongate setae. Ninth sternite, *9s*, with conspicuous oval lobes that are densely provided with long yellow setae. Gonapophyses, *g*, appearing as unusually large, flattened-compressed yellow blades that jut conspicuously beyond the genital chamber. Eighth sternite, *8s*, unarmed.

*Allotype*, ♀, Quad Creek, 10,000 ft., August 15, 1942.

♀. Length, about 20 mm.; wing, 13.5 mm.; antenna, about 3 mm.

Characters as in male, differing chiefly in the sexual characters. Antennae much shorter; flagellar segments cylindrical or nearly so, the basal enlargements scarcely evident; longest verticils subequal in length to the segments; terminal segment without verticils, abruptly narrowed at tip. Legs much shorter and stouter than in male; femora somewhat more extensively blackened. Wings proportionately a little shorter but with no distortion of the venation. Abdomen slightly elongated. Ovipositor with genital shield blackened; cerci brownish yellow, elongate, relatively broad, compressed-flattened, their tips acute, margins smooth; hypovalvae shorter than the cerci, extending about to three-fourths the length of the latter, their tips rounded.

*Tipula (Lunatipula) pleuracicula* Alexander, 1915 (*monochroma* Dietz, 1919).—Tower Falls, 6,500 ft., along creek, June 25, 1941; Northeast Entrance, 7,200 ft., June 24 and 26, 1941.

*Tipula (Lunatipula) satyr* Alexander, 1915, ♂; (*claasseni* Alexander, 1920, ♀).—The holotype of *satyr* was from an unknown locality in Colorado,

contained in the C. V. Riley Collection in the United States National Museum, and was presumed to have been taken by Henry K. Morrison. The type of *clauseni* was from Lawn Lake in the Mummy Range, Rocky Mountain National Park, Colorado, 11,000 ft., collected August 27, 1919, by the late Dr. P. W. Claassen. The two sexes are so different from one another in their general appearance that it was necessary to take both at the same time and place, or in copula, in order to settle their identity. Several specimens of both sexes were taken by Mr. and Mrs. Sperry at Quad Creek, Bear Tooth Mountains, Montana, 10,200 ft., August 19, 1942, and the synonymy is certain.

The species belongs to the *bicornis* (*fascipennis*) group but is entirely distinct from the five species of the group hitherto described from the Nearctic region. All such occur in northern and eastern North America. Among such species, the present fly is most similar to *Tipula* (*Lunatipula*) *parshleyi* Alexander, 1915, yet entirely distinct. The present species is now known from Colorado, the high mountains of the Montana-Wyoming border and recurs in the highest mountains of central Gaspé in eastern Quebec.

Male hypopygium (Fig. 8) with the ninth tergite, *9t*, separated from the sternite by a suture that is lost only at the extreme cephalic portion of the sclerite. Basistyle, *b*, incompletely separated from the sternite, the suture indicated on the dorsal and ventral portions. Total area of basistyle and ninth sternite much restricted by the large eighth sternite. Ninth tergite, *9t*, subquadrate, the caudal border gently and sinuously emarginate, with a further very deep, parallel-sided median notch, the lateral lobes produced into strong horn-like points; on dorsal surface of tergite, on outer half and closer to the lateral border than to the midline, an even longer reddish horn that is directed chiefly caudad; dorsal surface of tergite behind the median split with an impressed furrow, the adjoining surfaces with a concentration of strong setae, lacking on

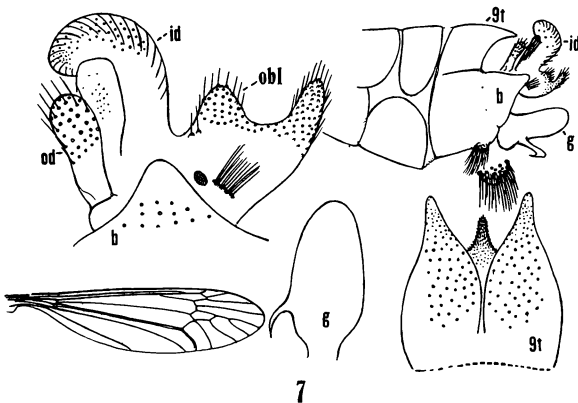


Fig. 7. *Tipula* (*Lunatipula*) *sperryana* Alexander; venation and male hypopygium. (Symbols: *b*, basistyle; *g*, gonapophysis; *id*, inner dististyle; *obl*, outer basal lobe of inner style; *od*, outer dististyle; *s*, sternite; *t*, 9th tergite).

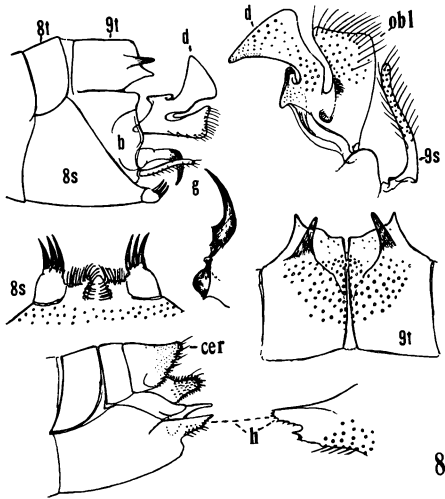


Fig. 8. *Tipula (Lunaticipula) satyr* Alexander; male hypopygium and ovipositor. (Symbols: b, basistyle; cer, cercus; d, dististyle; g, gonapophysis; h, hypovalvae; s, sternite; t, 9th tergite.)

cephalic portion of sclerite, reduced to small scattered setulae on the broad outer tergal plates. Dististyle, *d*, of irregular conformation; outer basal lobe, *obl*, subequal in size to the main body of style and not differing greatly therefrom in shape; surface of this lobe provided with abundant, very long and delicate setae that are directed outward and backward. From the dorso-mesal angle of the ninth sternite, *9s*, juts caudad a long, gently sinuous, cylindrical rod that is provided with numerous long setae that are directed chiefly ventrad. Gonapophyses, *g*, blackened, projecting conspicuously from the genital chamber, their basal portions straight, directed caudad, the long acute tips directed strongly ventrad. Eighth sternite, *8s*, large and conspicuously sheathing; outer lateral angles cut off by sutures into small oval lobes, each terminating either in two or in three very powerful blackened spines but without surface setae; median area of border with additional smaller setae, including a central group that are directed mesad, placed on either side of a small conical median lobule.

Ovipositor (Fig. 8) with both cerci, *cer*, and hypovalvae, *h*, very short, the former appearing as blunt fleshy lobes, their caudal margin oblique, provided with an abundant short setae and scattered longer ones. Hypovalvae appearing as pale, compressed-flattened blades, the apex of each irregularly toothed, the most dorsal point or denticle largest. The abdomen of the female studied was filled with unusually large black eggs having very heavy chorion.

#### CYLINDROTOMINAE

*Cylindrotoma pallescens* Alexander, 1930.—Northeast Entrance, 7,200 ft., June 24 and 26, 1941; Obsidian Creek, 7,300 ft., June 27, 1941.

## LIMONIINAE

## LIMONIINI

*Limonia (Limonia) indigena jacksoni* (Alexander, 1917).—Tower Falls, 6,500 ft., June 25, 1941.

*Limonia (Limonia) sciophila* (Osten Sacken, 1877).—Tower Falls, 6,500 ft., June 25, 1941; Northeast Entrance, 7,200 ft., June 24, 1941.

*Limonia (Metalimnobia) solitaria* (Osten Sacken, 1859).—Tower Falls, 6,500 ft., June 26, 1941; Northeast Entrance, 7,200 ft., June 24, 1941.

*Limonia (Dicranomyia) brevivena* (Osten Sacken, 1869).—Emerald Pool, 7,275 ft., June 29, 1941.

*Limonia (Dicranomyia) morioides* (Osten Sacken, 1860).—Northeast Entrance, 7,200 ft., June 24, 1941.

*Limonia (Dicranomyia) nycteris* (Alexander, 1927).—Northeast Entrance, 7,200 ft., June 24, 1941.

*Limonia (Dicranomyia) penicillata* (Alexander, 1927).—Obsidian Creek, 7,300 ft., June 27, 1941; Upper Geyser Basin, near the Giant Geyser, 7,300 ft., June 29, 1941.

*Limonia (Dicranomyia) geysereusis* sp. nov.—Allied to *haeretica*; general coloration of male gray, of the female more ochereous; rostrum dark brown; antennae black throughout; mesonotal praescutum with a conspicuous brownish black median stripe; knobs of halteres dark brown; legs chiefly dark brown; wings of male fully developed, of female reduced to microscopic scales; in male, vein  $Sc_1$  relatively long; male hypopygium with the rostral prolongation moderately deep, the two spines placed less than their own length apart.

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

♀. Length, about 6 mm.; wing, 1.5 x 0.3 mm.

Rostrum and palpi dark brown. Antennae black throughout; flagellar segments subglobular to short-oval, the outer segments passing through oval to elongate-oval. Head dark gray, the anterior vertex weakly infuscated; anterior vertex (male) a little less than three times the diameter of scape.

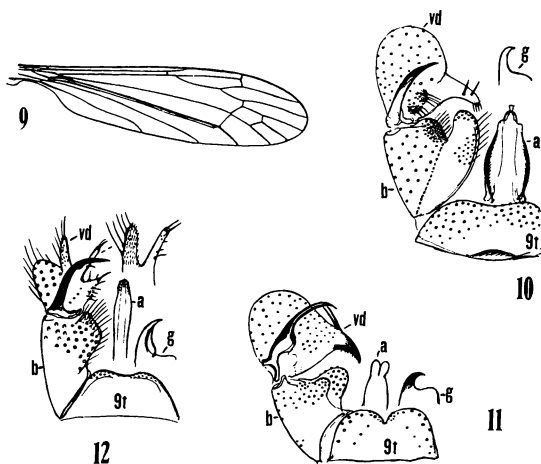
Pronotum broadly blackened medially, narrowly ochereous on sides, the scutellum more broadly so. Mesonotum light gray, the praescutum with a broad brownish black median stripe that becomes obsolete at near two-thirds the length of the sclerite; lateral stripes obsolete; in female, the ground color of notum more ochereous but the pattern of praescutum identical; posterior sclerites of notum heavily pruinose in male, the posterior border of scutellum more ochereous; in female, the posterior notum more ochereous. Pleura gray pruinose in male, more ochereous in female. Halteres short, stem yellow, knob dark brown. Legs with the coxae obscure yellow, the fore and middle pairs slightly more darkened; femora, tibiae and basitarsi dark brown, restrictedly brightened at their bases, the tips conspicuously blackened; remainder of legs black. Wings of male (Fig. 9) fully developed, with a weak brown tinge, the

prearcular field more whitened; stigma not or scarcely darkened; veins brown. Venation:  $Sc_1$  ending a short distance beyond origin of  $R_s$ ,  $Sc_2$  some distance from the tip of  $Sc_1$  so the latter vein is unusually long for a member of this group, approximately equal in length to vein  $R_{2+3}$ ;  $m-cu$  close to the fork of  $M$ . In female, the wings are reduced to microscopic scales, as shown by the measurements; main stem of  $R$  preserved and with a series of macrotrichia extending back to arculus; a linear row of setae in the membrane about where vein  $R_{2+3}$  is normally present but with no indication of the vein itself; cubital vein preserved as a more or less distinct thickening but without macrotrichia. Wings about two and one-half times as long as the halteres. Venation: Prearcular field unusually long, occupying more than the basal fourth of the entire wing.

Abdominal tergites brown medially, paling to brownish yellow on sides; subterminal segments more uniformly and extensively darkened; sternites obscure yellow, with a narrow subterminal brown ring; hypopygium chiefly yellow. Male hypopygium (Fig. 10) of the general type of *haeretica* and *penicillata*. Dorsal dististyle relatively narrow, its distal fourth narrowed into a slender apical spine. Ventral dististyle, *vd*, with the setae on mesal face at base arranged in two distinct groups but not forming pencils; rostral prolongation moderately deep, the two spines placed less than their own length apart.

*Holotype*, ♂, Yellowstone, near the Giant Geyser, 7,300 ft., June 29, 1941 (C. P. Alexander). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, 6 ♂♂, with the type; *paratype*, 1 ♂, Emerald Pool, 7,275 ft., July 10, 1942.

The types were swept from low rushes near the geyser. Here they were



Figs. 9, 10. *Limonia (Dicranomyia) geysereusis* sp. n.; venation and male hypopygium. Fig. 11. *Limonia (Dicranomyia) fulva fulvoides* subsp. n., male hypopygium. Fig. 12. *Limonia (Alexandriaria) phalangioides* sp. n.; male hypopygium. (Symbols: a, aedeagus; b, basistyle; g, gonapophysis; t, 9th tergite; vd, ventral dististyle.)

found crawling about near the ground, associated with several species of Saldid bugs and with Carabid beetles of the genus *Elaphrus*.

The present insect is of unusual interest in that it is one of two species of the vast genus *Limonia* Meigen found in the Yellowstone (compare also *Limonia phalangioides* sp. nov.) in which the wings of one or both sexes are greatly reduced, a condition not before known in any Nearctic member of the genus. In the present species it is only the female that has the wings so reduced but here the degeneration is profound and by the scale of classification proposed by Bezzi (*Riduzione e scomparsa delle ali negli insetti ditteri. Rivista di scienze naturali*, "Natura," 7: 85-182, 11 figs.; 1916) would fall in his group 5, including species having squamiform wings with indistinct venation and distinctly longer than the halteres, giving the insect somewhat of a nymphal aspect. It should be noted that in both of these subapterous *Limonia* species the wings, in addition to being much reduced in size are of the stenopterous type, long and narrow, and that consequently the reduction of area is considerably greater than in the case of a brachypterous wing of the same length.

Despite the uniqueness of the character of wing reduction in the female, the fly is closely related to *Limonia (Dicranomyia) haeretica* (Osten Sacken, 1869) and *L. (D.) penicillata* (Alexander, 1927), both of which are fully-winged in both sexes. The structure of the male hypopygium in all three of these species is generally alike though differing in minor details. The males of the present fly are most readily told from such allies by the conspicuous gray body coloration, the dark brown rostrum, conspicuously darkened legs, and by the unusually long vein  $Sc_1$ . In *penicillata*, the rostral prolongation of the ventral dististyle is long and relatively narrow, with the outer spine placed more than its own length from the tip; setae at base of mesal face of ventral dististyle forming two conspicuous brushes or pencils.

*Limonia (Dicranomyia) athabasca* (Alexander, 1927).—Obsidian Creek, 7,300 ft., June 27, 1941; Elk Park, 7,000 ft., June 28, 1941; Emerald Pool, 7,275 ft., June 29 and 30, 1941; one of the most abundant and characteristic crane-flies in all three stations. Not before recorded from the United States.

*Limonia (Dicranomyia) fulva fulvoides* subsp. nov.—Mesonotum almost uniformly dark brownish gray, without clearly defined stripes; antennae black throughout; halteres pale, the knobs weakly darkened; male hypopygium with the ninth tergite deeply notched medially; gonapophyses with mesal-apical lobe strongly curved, its blackened tip acute.

♂. Length, about 6.5-7 mm.; wing 7.6-8.5 mm.

♀. Length, about 7-7.5 mm.; wing, 7.5-8 mm.

Rostrum light brown; palpi brownish black. Antennae black throughout; basal flagellar segments short-oval, the outer ones longer; verticils a little shorter than the segments. Head gray; anterior vertex of moderate width, a little more than twice the diameter of scape.

Pronotum dark brownish gray. Mesonotum almost uniform dark brownish gray, the praescutum without clearly defined stripes; scutellum and median region of scutum a little paler. Pleura slightly more testaceous, sparsely pruinose. Halteres short, stem pale, knob weakly darkened. Legs with the coxae and trochanters yellow; femora obscure yellow, their tips scarcely darker; tibiae and proximal segments of tarsi brownish yellow, the outer tarsal segments black. Wings with a very faint grayish tinge, the prearcular field more whitened; stigma oval, pale brown, inconspicuous; veins brown, those in the prearcular field more whitened. Venation:  $Sc_1$  ending a short distance beyond origin of  $R_s$ ,  $Sc_2$  a short distance from its tip;  $R_s$  weakly angulated to short-spurred at origin;  $m-cu$  at or close to fork of  $M$ .

Abdominal tergites and outer sternites dark brown, the basal sternites and hypopygium more yellowish. Male hypopygium (Fig. 11) with the ninth tergite,  $9t$ , extensive, deeply notched medially, the lobes broadly rounded; outer margin of lobes thickened; setae chiefly marginal, those toward the median notch smaller but abundant. Basistyle,  $b$ , with the ventromesal lobe simple, at its base with a smaller accessory lobule. Dorsal dististyle widely dilated near base, suddenly narrowed into a slender blackened rod, the acute tip decurved. Ventral dististyle,  $vd$ , of moderate size, its total area about equal to that of the basistyle; rostral prolongation blackened and acute at apex; rostral spines two, placed close together near base of rostrum, a little shorter than the remainder of style beyond the point of their insertion. Gonapophyses with mesal-apical lobe strongly curved, the blackened tip acute.

*Holotype*, ♂, Lewis Lake, Yellowstone, July 1, 1941 (C. P. Alexander).

*Allotopotype*, ♀, pinned with type. *Paratopotypes*, 3 ♀ ♀, with the types (W. H. Harrison); *paratypes*, ♂ ♀, Canyon Camp, 7,800 ft., June 21, 1941; Emerald Pool, 7,275 ft., July 12, 1942 (C. P. Alexander).

Typical *fulva* (Doane, 1900) is known to me only from the original description and from a carefully drawn figure of the hypopygium of the unique male of the type series (Pullman, Washington). I am greatly indebted to Dr. Henry Townes for making this drawing and certain others. The Yellowstone material differs from the description and figure in certain details that seem to make it inadvisable to determine the material as being typical *fulva*. Doane describes his species as being yellowish, but in the present fly there is little or no yellow coloration; antennae black throughout; halteres with darkened knobs; male hypopygium with the ninth tergite more deeply notched; mesal-apical lobe of gonapophysis acutely pointed and blackened at tip.

*Limonia (Dicranomyia) halterata* (Osten Sacken, 1869).—Northeast Entrance, 7,200 ft., June 24 and 26, 1941; numerous.

*Limonia (Dicranomyia) humidicola* (Osten Sacken, 1859) (*badia* of authors, nec Walker, 1848).—Northeast Entrance, 7,200-7,300 ft., along small mountain stream, abundant, June 26, 1941; Emerald Pool, 7,275 ft., June 29, 1941.

*Limonia (Alexandriaria) phalangioides* sp. nov.—Allied to *whartoni*;

wings reduced to mere pads that are only about one-half longer than the halteres, their shape and venation greatly distorted; legs long and slender; male hypopygium with the lateral lobe of ventral dististyle provided with abundant delicate setulae, in addition to a few long conspicuous setae.

♂. Length, about 5 mm.; wing, about 1 mm. Fore leg; femur, 5 mm.; tibia, 5.3 mm.; tarsus about 4.8 mm; leg total, 15.1 mm.

Mouth parts, including palpi, brown; maxillary palpi with the three outer segments subequal in length, elongate-oval. Antennae with the scape brown, the pedicel and flagellum still darker brown; flagellar segments oval, the outer ones becoming more elongate and with progressively narrower points of connection between the segments. Head brown, extensive; anterior vertex about twice the diameter of the scape.

Pronotum dark brown medially, obscure yellow on sides. Mesonotum strongly gibbous, obscure yellow laterally, the praescutum with a conspicuous, dark brown, median stripe on cephalic portion, this becoming obsolete some distance before the suture; lateral praescutal stripes not indicated; posterior sclerites of notum obscure buffy yellow, the posterior portion of mediotergite restrictedly darkened. Pleura uniform buffy yellow. Legs unusually long and slender when compared to the length of body; coxae and trochanters yellow; remainder of legs brownish black to black, the femoral bases restrictedly obscure yellow; claws very long and slender, only gently curved, provided with a single long spine at about one-fourth the length. Wing of male greatly reduced in size, about one-half longer than the halteres, pale basally, the outer portion more suffused with dusky; wings strongly bent or angulated at about one-third the length; only two longitudinal veins persist, which from their positions apparently represent *R* and *Cu*, the former with a complete series of strong macrotrichia, these totalling about 35 in number; the supposed vein *Cu* glabrous; in the field between these two veins a few isolated trichia in longitudinal rows, evidently pertaining to the outer radial and medial veins.

Abdominal tergites reddish brown, with indications of a median brown stripe, deepest in color on the basal segment; sternites a trifle paler; hypopygium yellow. Male hypopygium (Fig. 12) of the general type of *whartoni*. Ninth tergite, *9t*, with the caudal margin very gently emarginate, the lobes very low, each with about a score of long setae. Basistyle, *b*, with the ventromesal lobe lying far distad, subrectangular in outline, covered with abundant coarse setae. Dorsal dististyle a long curved rod, gradually narrowed to the acute tip. Ventral dististyle, *vd*, of irregular conformation, as in *whartoni*; body of style small; outer paired lobes elongate, the lateral one with about seven or eight long setae and abundant, more delicate setulae, these latter lacking in *whartoni*; inner lobe subequal in length but more slender, terminating in two strong setae and with fewer ordinary setae throughout the length, some of the latter very small. Gonapophyses, *g*, with a conspicuous flange in the curve of the mesal-apical lobe.

*Holotype*, ♂, Emerald Pool, 7,275 ft., July 10, 1942 (C. P. Alexander).



The unusual insect described above is of exceptional interest. It is the first member of the genus *Limonia* in the Nearctic fauna in which the male sex is nearly apterous (compare *Limonia geysereensis* sp. nov., in which the wings of the female only are somewhat similarly reduced). The general appearance of the present fly is much like a small harvestman or Phalangid, whence the specific name. Superficially the fly suggests one of the subapterous species of the Pediciine genera *Dicranota* Zetterstedt and *Polyangaenus* Doane, and when I first captured the unique type specimen, I believed it represented still another member of this tribe. The structure of the male hypopygium proves conclusively that it belongs to the subgenus *Alexandriaria* Garrett, 1922, and is closest to the only species that has been found in northeastern North America, *whartoni* (Needham, 1908). The nearly apterous condition will readily separate the fly from the various related species or forms, all of which are fully winged in both sexes. Although only a single male is known, it is virtually certain that the female has the wings reduced in similar manner. No Tipulid fly has ever been discovered having subapterous males and fully winged females. By Bezzi's scale of wing-reduction in the Diptera (reference cited under *Limonia geysereensis*), this fly likewise falls in his group 5, as defined earlier.

I captured the fly by sweeping rank herbage along the small stream in Study Area 7, defined earlier. The specimen had crawled up a plant to a height of more than a foot and was not observed until found in the net. The chances of finding specimens of such a flightless insect seem very slight.

*Limonia (Geranomyia) diversa* (Osten Sacken, 1859).—Emerald Pool, 7,275 ft., abundant, June 29 and 30, 1941; July 10 and 12, 1942.

*Limonia (Geranomyia) canadensis* (Westwood, 1835).—Emerald Pool, 7,275 ft., June 29 and 30, 1941.

*Antocha (Antocha) monticola* Alexander, 1917.—Along the Gibbon River, near Elk Park, 7,000 ft., June 28, 1941 (*W. H. Harrison*).

#### PEDICIINI

*Ula paupera* Osten Sacken, 1869.—Emerald Pool, 7,400 ft., July 12, 1942; swept from small alpine firs.

*Ornithodes harrimani* Coquillett, 1900.—Sylvan Lake, 8,000 ft., June 21, 1941; a single male specimen flying along a small mountain stream in lodgepole pine forest. The first record of the genus or species from the United States. Described from a unique male taken at Prince William Sound, Alaska, June 22, 1899, by Kincaid; later taken at Juneau, Alaska (1901, *de Joannis*, in Paris Museum) and at Laggan, Alberta (July 16, 1928, *Owen Bryant*).

*Pedicia (Tricyphona) sparsipuncta* (Alexander, 1920). — Northeast Entrance, 7,200 ft., June 24, 1941. There appears to be a considerable range in the relative diameter of the lateral arms of the ninth tergite of the hypopygium in various specimens that have been referred to this species.

*Pedicia (Tricyphona) aperta* (Coquillett, 1905).—Emerald Pool, 7,275 ft., July 12, 1942.

*Dicranota (Dicranota) montana* Alexander, 1920.—Northeast Entrance, 7,200 ft., June 24, 1941.

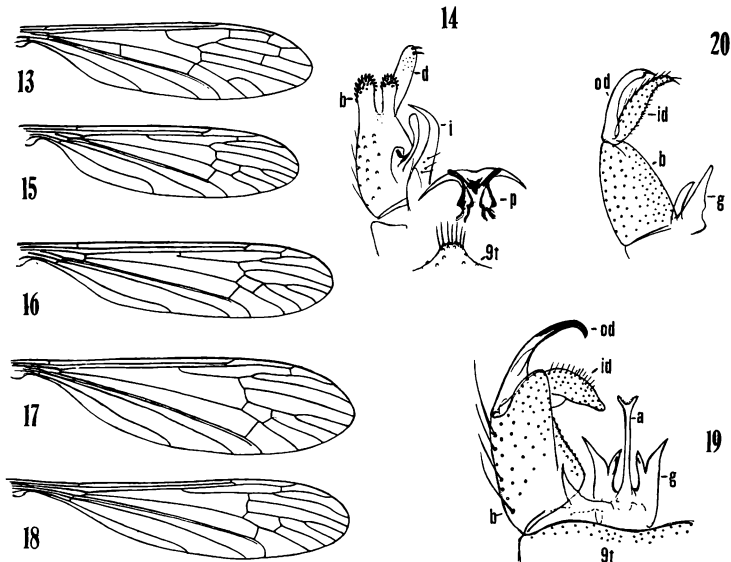
*Dicranota (Rhabdrolabis) cayuga* (Alexander, 1916). — Northeast Entrance, 7,200 ft., June 26, 1941. One male is of unusual size (Length about 6 mm.; wing, 8 mm.).

**Polyangaeus subapterogyne** sp. nov.—Sexes dimorphic; males fully winged, females subapterous; mesonotal praescutum brownish yellow. laterally, the central portion deepening to a more or less distinct brown stripe; antennae (male) short, 12-segmented.

♂. Length, about 3-3.5 mm.; wing, 4-5 mm.

♀. Length, about 3-3.5 mm.; wing, about 0.8-1.1 mm.

*Male.* Rostrum and palpi dark brown. Antennae unusually short, 12-segmented; basal flagellar segments very short and crowded, with short verticils. Head dark grayish brown; eyes relatively small; anterior vertex broad, exceeding in width the visible diameter of a single eye.



Figs. 13, 14. *Polyangaeus subapterogyne* sp.n.; venation and male hypopygium. Fig. 15. *Pseudolimnophila vidua* sp.n.; venation. Fig. 16. *Limnophila (Phylidorea) nycteris* sp.n.; venation. Fig. 17. *Limnophila galactopoda* sp.n.; venation. Fig. 18. *Pilaria phaeonota* sp.n.; venation. Fig. 19. *Limnophila (Phylidorea) nycteris* sp.n.; male hypopygium. Fig. 20. *Pilaria phaeonota* sp.n.; male hypopygium. (Symbols: a, aedeagus; b, basistyle; g, gonapophysis; i, interbase; id, inner dististyle; t, 9th tergite.)

Pronotum yellow, weakly patterned with brown. Mesonotal praescutum brownish yellow, darkening to produce a brown median stripe, most distinct on cephalic half of sclerite, the lateral portions much paler; posterior sclerites of notum obscure yellow, without markings. Pleura obscure yellow, weakly darkened on ventral sternopleurite and meron; dorsopleural region even clearer yellow. Halteres dark brown, the basal fourth of stem yellow. Legs with the coxae and trochanters pale yellow; femora pale yellow, the tips conspicuously blackened; tibiae white, the extreme base and slightly wider tip blackened; tarsi brownish black, the proximal portion of basitarsi slightly paler. Wings (Fig. 13) relatively narrow, grayish subhyaline, weakly patterned with light brown, distributed as follows:  $Sc_2$ , tip of  $Sc_1$ ;  $R_2$  and the supernumerary crossvein in cell  $R_1$ ; cord and fork of  $M_{3+4}$ ; over the supernumeraries in the various cells; veins pale brown, a trifle darker in the clouded areas. Venation: Supernumerary crossveins in cells  $R_1$ ,  $R_3$ ,  $R_4$  and  $M$ ; considerable variation and abnormalities of venation occur in the type series, the chief of which are as follows.—Cell  $M_1$  present or lacking, as shown in figure; in cases with only the base of vein  $M_2$  atrophied, the tip lying free in membrane; in cases, the supernumerary crossvein in cell  $R_4$  lacking; in even rarer instances the base of vein  $M_3$  is atrophied and the supernumerary crossvein in cell  $R_1$  may lie before the fork of  $R_{2+3+4}$ .

Basal abdominal tergites bicolored, obscure brownish yellow, the posterior borders darker brown; outer segments, including hypopygium, more uniform dark brown to brownish black. Male hypopygium (Fig. 14) with the median region of tergite,  $9t$ , produced into a conspicuous entire lobe that is provided with about ten long setae, grouped chiefly on extreme apical portion; lateral tergal arms produced into a flattened blade that is further narrowed into a glabrous cultrate to obtuse rod. Basistyle,  $b$ , at apex produced into two subequal lobes that are set apically with abundant blackened spines; interbase,  $i$ , a flattened yellow blade that narrows to a powerful curved spine, the surface with abundant microscopic setulae; near proximal portion of interbase with about four conspicuous setigerous punctures arranged in a more or less straight row. Dististyle,  $d$ , a flattened pale blade, the apex obtuse, provided with two strong spinous setae; other smaller setae over the surface, chiefly near apex; at base of style with a small appressed lobe or tubercle that terminates in a single powerful seta. Phallosome,  $p$ , appearing as a conspicuous blackened structure that terminates in two strongly divergent blackened rods; what appears to represent a part of the phallosome consists of two very strongly divergent horns that are straight or slightly decurved.

*Female.* Differs from male in sexual characters. Wings reduced to narrow pads, the venation chiefly atrophied; marginal setae of costal and anal regions conspicuous. Ovipositor with the valves, especially the cerci, of unusual size and development.

*Holotype*, ♂, Hidden Falls, Grand Teton National Park, 7,000 ft., July 4, 1941 (*M. M. Alexander*). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, several of both sexes with the types; *paratypes*, 1 ♂, Leigh Lake, Grand

Tetons, 6,875 ft., July 10, 1941; Moran, bog, near Grand Tetons, 6,800 ft., July 2, 1941; Yellowstone, Obsidian Creek, 7,300 ft., June 27, 1941; Emerald Pool, 7,275 ft., June 29 and 30, 1941.

*Polyangaeus subapterogyne* differs from the only other species so far described, the genotype, *maculatus* Doane, 1900, in the very short 12-segmented antennae, the narrower wings of the male, and in the details of coloration and the structure of the male hypopygium. I have no data to indicate whether or not the female of *maculatus* is subapterous or fully winged. I possess a third, still undescribed species of *Polyangaeus* from the Grand Teton National Forest that is fully winged in both sexes.

This is the third undescribed species discovered in the Yellowstone survey that was subapterous in either the female or in both sexes. By Bezzi's scale of classification of wing reduction and apterism in the Diptera (cited under account of *Limonia geysereensis* sp. nov.), the present fly falls in group 5, as was the case with the two species previously considered.

In the Yellowstone, only males were taken at Obsidian Creek; the first discovered female was swept from rank herbage along the stream at Emerald Pool. In the Grand Tetons, near Hidden Falls, a large series of both sexes was found on shaded earthen banks along the trail where there was a dense growth of mosses and foliaceous liverworts, the bank being shaded by alpine fir; *Ribes*, especially *pavulum* (Gray) Rydb.; *Bossekia parviflorus* (Nuttall); *Sorbus scopulina* Greene; *Acer glabrum* Torrey, and other characteristic plants. The females were found by us only when we lay prostrate on the ground and detected them crawling about over the beds of mosses and liverworts in very moist situations.

#### HEXATOMINI

*Archilimnophila subunica* (Alexander, 1920). — Yellowstone, Canyon Station, 8,000 ft., July 4, 1924 (*J. S. Alexander*); Northeast Entrance, 7,200 ft., June 26, 1941; near Sylvan Lake, 8,000 ft., July 13, 1942.

*Pseudolimnophila vidua* sp. nov.—General coloration, the praescutum dark gray with a single broad median brown stripe; pleura clear light gray; femora with tips broadly black, widest on fore legs, narrower on posterior pair where about the distal half is included; wings with a strong brown tinge, unpatterned; *Rs* long; abdomen black, the sternites more pruinose.

♀. Length, about 8-8.5 mm.; wing, 8-9 mm.

Rostrum gray; palpi black. Antennae black throughout, the scape sparsely pruinose; flagellar segments passing through oval to elongate; verticils of outer segments conspicuous. Head light gray.

Thoracic dorsum black, gray pruinose, the praescutum with a single broad median brown stripe, the lateral stripes not or scarcely defined. Pleura light gray pruinose. Halteres obscure yellow to weakly dusky, the knobs darker. Legs

with the coxae gray; trochanters brownish yellow; femora obscure yellow basally, the tips very extensively black, on the fore pair including the distal three-fourths or more, on the posterior legs involving the outer half; tibiae dark brown, the posterior pair more yellowish brown, their tips narrowly blackened; tarsi black. Wings (Fig. 15) with a strong brownish tinge, virtually unpatterned, the oval stigma only a trifle darkened; centers of cells *R* and *M*, and the bases of Anal and Cubital cells a little clearer; veins brown. Venation: *R*<sub>s</sub> a little longer than in *inornata*; *R*<sub>2+3+4</sub> relatively short and arcuated, from one-third to about two-thirds longer than *R*<sub>2+3</sub>; *m-cu* more than one-third its length beyond the fork of *M*.

Abdomen black, the sternites more pruinose; genital shield black, pruinose.

*Holotype*, ♀, Emerald Pool, 7,275 ft., June 29, 1941 (C. P. Alexander).

*Paratopotypes*, Sex?, June 30, 1941; 1 ♀, July 12, 1942 (C. P. Alexander).

*Pseudolimnophila vidua* is most closely related to the more eastern *P. inornata* (Osten Sacken, 1869) which differs in details of coloration, especially the legs, the femora not being blackened as in the present fly. It is probable that both species are more or less closely restricted to boggy (oxylophytic) areas.

*Limnophila (Elaeophila) angustior* Alexander, 1919.—Emerald Pool, 7,275 ft., June 30, 1941.

*Limnophila (Phylidorea) tepida* Alexander, 1926.—Sylvan Lake, 8,000 ft., June 21, 1941; Northeast Entrance, 7,200 ft., June 24, 1941; Obsidian Creek, 7,300 ft., June 27, 1941; Emerald Pool, 7,275 ft., June 29, 1941. The Sylvan Lake specimens have the entire thorax darker gray and more heavily pruinose than in the type.

*Limnophila (Phylidorea) claggi* Alexander, 1930.—Tower Falls, 6,500 ft., June 23, 1941.

***Limnophila (Phylidorea) nycteris* sp. nov.**—General coloration polished black, including the head and the entire disk of the praescutum; fore femora with more than the apical half blackened, the posterior pair narrowly blackened at tips; tibiae and basitarsi brownish yellow, the tips narrowly blackened; wings with a weak brownish tinge, the stigma brown; veins of outer two-thirds of wing conspicuously seamed with pale brown; *R*<sub>s</sub> elongate; male hypopygium with the gonapophyses conspicuously bifid at apex.

♂. Length, about 12 mm. ♀. Length, about 14 mm.; wing, 10 mm.

Rostrum and palpi black. Antennae short; scape and pedicel black, flagellum dark brown; basal flagellar segments short-cylindrical, the outer segments more elongate; longest verticils of outer segments a little exceeding the segments in length. Head polished black, strongly prolonged and narrowed behind; anterior vertex relatively wide, nearly three times the diameter of scape.

Pronotum and mesonotum polished black, the extreme lateral borders of praescutum, median area of scutum and the scutellum sparsely gray pruinose. Pleura black, gray pruinose, dorsopleural membrane dusky. Halteres yellow.

Legs with the coxae black, sparsely pruinose; trochanters obscure yellow; femora yellow basally, the tips blackened, very broadly so on fore pair where the outer three-fifths is included, much narrower on the posterior legs where about the distal eighth is blackened; tibiae and basitarsi brownish yellow, the tips narrowly darkened; remainder of tarsi black. Wings (Fig. 16)) with a weak brownish tinge, the prearcular field and cells C and Sc yellow; stigma oval, brown; narrow but relatively conspicuous pale brown seams on most of the longitudinal veins, most conspicuous and distinct on the outer two-thirds of wing, the wing tip somewhat similarly darkened; veins brown, yellow in the flavous portions. Venation:  $R_5$  relatively long, angulated and spurred at origin, nearly three times as long as  $R_{2+3+4}$ ;  $m$  reduced in length to lacking (as shown).

Abdomen, including the genitalia of both sexes, black; ovipositor with the elongate cerci horn-yellow. Male hypopygium (Fig. 19) with the posterior border of tergite,  $9t$ , gently emarginate. Basistyle,  $b$ , short and stout, at apex produced into a stout black lobe. Outer dististyle,  $od$ , a slender rod, gradually narrowed and curved to a simple acute black point. Inner dististyle shorter and stouter, simple, provided with numerous erect setae. Gonapophyses,  $g$ , appearing as flattened plates, each deeply bifid at apex, the outer point longer. Aedeagus slender, weakly emarginate at apex.

*Holotype*, ♂, Emerald Pool, 7,275 ft., June 30, 1941 (C. P. Alexander).  
*Allotopotype*, ♀, with the type.

The most similar species is *Limnophila* (*Phylidorea*) *euxesta* Alexander (Washington, Oregon) which has the praescutal interspaces conspicuously yellowish gray pruinose to isolate four polished black stripes. It further shows marked differences in the pattern of the legs and wings and in the venation. The unique male specimen of this new fly was found alive in my net while sweeping but both wings had been broken off close to the body.

*Limnophila galactopoda* -

see Fig. 17

***Pilaria phaeonota*** sp. nov. Head gray; mesonotum uniformly brownish dark brown, the lateral portions of praescutum brownish yellow; thoracic pleura obscure yellow, weakly patterned with darker; legs obscure yellow, the tips of femora weakly darkened; all tarsi white; wings with a brownish tinge, the long-oval stigma pale brown, a little darker than the ground;  $R_{2+3+4}$  shorter than the basal section of  $R_5$ ;  $m-cu$  lying far distad, only about one-fourth to one-fifth its length from the fork of  $M_{3+4}$ .

♀. Length, about 6.5-7 mm.; wing, 6.5-7 mm.; antenna, about 1.8-1.9 mm.

Rostrum brownish yellow; palpi brown. Antennae of moderate length, with indications that in the male sex it may be elongate; scape and pedicel yellow, flagellum brownish black; flagellar segments long-oval or with the ventral face slightly more protuberant than the upper one; longest verticils from one-third to one-half longer than the segments; terminal segment subequal in length to the penultimate. Head dark brownish gray; anterior vertex broad, five or six times as wide as the diameter of scape.

Pronotum brownish yellow, a little darker above. Mesonotum chiefly dark brown, the median region of scutum very restrictedly paler; humeral and lateral portions of praescutum obscure brownish yellow. Pleura obscure yellow, weakly patterned with brown on the ventral anepisternum and sternopleurite. Halteres with stem yellow, knob dark brown. Legs with the coxae and trochanters pale yellow; femora obscure yellow, the tips weakly darkened; tibiae brownish white, the tips very narrowly darkened; all tarsi white, only the extreme apex of the last segment more darkened. Wings (Fig. 17) with a brownish tinge, the costal and prearcular fields a trifle more yellow; stigma long-oval, pale brown, a little darker than the ground; veins pale brown, including those in the brightened fields. Macrotrichia of veins abundant and of moderate length. Venation:  $Sc_1$  ending opposite or shortly before the level of the fork of  $R_s$ ,  $Sc_2$  a short distance from its tip;  $R_{2+3+4}$  shorter than the basal section of  $R_5$ ;  $R_{2+3}$  gently sinuous underneath the stigma; cell  $M_1$  about twice its petiole;  $m-cu$  lying far distad, only about one-fourth to one-fifth its own length from the fork of  $M_{3+4}$ .

Abdominal tergites dark brown, the sternites a trifle paler, the segments with conspicuous yellow setae. Ovipositor with valves slender especially the cerci which are slightly upcurved.

*Holotype*, ♀, Emerald Pool, 7,400 ft., along small mountain stream on mountainside above the pool, July 12, 1942 (C. P. Alexander). *Paratopotype*, 1 ♀.

This very distinct fly is apparently related to a group of eastern Nearctic species centering about *Limnophila albipes* Leonard, 1913, and *L. niveitarsis* Osten Sacken, 1869. All such species have only the posterior tarsi white whereas in the present fly all the tarsi are conspicuously whitened, whence the specific name. I secured the type specimens by sweeping alpine firs along the mountain torrent above mentioned.

*Shannonomyia oslari* (Alexander, 1916).—Northeast Entrance, 7,200 ft., June 24 and 26, 1941; Emerald Pool, 7,275 ft., June 29, 1941.

*Pilaria phaeonota* sp. nov.—Head gray; mesonotum uniformly brownish black to black, contrasting abruptly with the yellow pleura and pleurotergite; antennae short in both sexes; wings with a weak brown tinge, the stigma a trifle darker; cell  $M_1$  present, longer than its petiole; abdominal tergites brownish black, basal sternites obscure yellow, narrowly bordered laterally with brown; outer segments, including hypopygium, black.

♂. Length, about 6.5-7 mm.; wing, 8.5-9 mm.; antenna, about 1.2-1.3 mm.

♀. Length, about 10 mm.; wing, 10 mm.

Rostrum and palpi black. Antennae black throughout, short in both sexes. Head dark gray; anterior vertex (male) relatively narrow, about twice the diameter of scape; in female wider, approximately three times the diameter of scape.

Pronotum restrictedly infuscated above, the scutellum and broad lateral portions of scutum yellow. Mesonotum brownish black to black, the surface sparsely pruinose; humeral and lateral portions of praescutum yellow. Pleura and pleurotergite abruptly light yellow. Halteres with stem obscure yellow, brighter at base, knob infuscated. Legs with coxae and trochanters yellow; femora, tibiae and basitarsi obscure yellow, the tips narrowly infuscated; outer tarsal segments uniformly brownish black. Wings (Fig. 18) with a weak brown tinge, the stigma a trifle darker; veins brown. Stigmal trichia relatively numerous. Venation:  $Sc$  relatively short,  $Sc_1$  ending a short distance before fork of  $R_s$ ,  $Sc_2$  longer, still closer to this fork;  $R_s$  long, lying relatively close to  $R_1$ ;  $R_2$  shorter than  $R_{2+3}$ ; cell  $M_1$  present, longer than its petiole;  $m-cu$  at or just beyond midlength of cell  $1st M_2$ ; cell  $2nd A$  relatively narrow.

Abdominal tergites dark brown to brownish black, the basal sternites obscure yellow, with narrow lateral brown borders; outer segments, including hypopygium, brownish black to black. Male hypopygium (Fig. 20) with the outer dististyle,  $od$ , microscopically serrulate on lower margin just before the apical spine. Inner dististyle darkened, terminating in two powerful bristles.

*Holotype*, ♂, Elk Park, 7,000 ft., June 28, 1941 (*C. P. Alexander*). *Allotopotype*, ♀, pinned with type. *Paratopotype*, ♂ ♀; *paratype*, 1 ♂, Old Faithful Basin, 7,300 ft., June 30, 1941.

In its general appearance, *Pilaria phaeonota* much resembles the eastern and northern North American *P. tenuipes* (Say), which differs conspicuously in the elongate male antennae. The other western North American species of *Pilaria* having short antennae are quite different in body coloration.

*Hexatoma (Eriocera) eriophora* (Williston, 1893).—Yellowstone, without more accurate data, July 23, 1930 (*Amer. Mus. Nat. Hist.*, No. F. 300, 723).

#### ERIOPTERINI

*Gonomyia (Idiocera) proserpina* sp. nov. — Belongs to the *blanda* group; general coloration gray, the praescutum with two intermediate brown stripes; antennae and rostrum black throughout; knobs of halteres weakly darkened; wings grayish subhyaline, restrictedly patterned with brown, as in the group;  $Sc$  long, veins  $R_{1+2}$  and  $R_3$  confluent at wing margin;  $m-cu$  more than its own length before the fork of  $M$ ; male hypopygium with the outer lobe of basistyle blunt at tip; outer dististyle entirely blackened, profoundly split into two acutely pointed arms, the inner one with a lateral spine; aedeagus terminating in a short recurved point.

♂. Length, about 5.5-5.5 mm.; wing, 6-7 mm.

♀. Length, about 5.5-6 mm.; wing, 6-7 mm.

Rostrum black, sparsely pruinose; palpi black. Antennae black throughout; flagellar segments passing from long-oval to subcylindrical. Head obscure yellow, more pruinose behind; center of vertex with a conspicuous brown spot.



Pronotum yellowish gray, patterned with brown. Mesonotal praescutum gray with two conspicuous intermediate brown stripes that diverge slightly behind, crossing the suture and involving the mesal portions of the scutal lobes; pseudosutural foveae conspicuous, their inner end reaching the dark stripes; scutellum light brownish yellow, somewhat brighter medially; remainder of mesonotum gray. Pleura gray, with a conspicuous obscure yellow longitudinal stripe extending from the fore coxae to the base of abdomen, passing above the base of the hind coxae; dorsopleural membrane weakly darkened. Halteres long, stem yellow, knob weakly darkened. Legs with the coxae chiefly testaceous yellow, their bases narrowly darkened; trochanters obscure yellow; remainder of legs obscure yellow, the tarsi slightly darkened. Wings (Fig. 21)

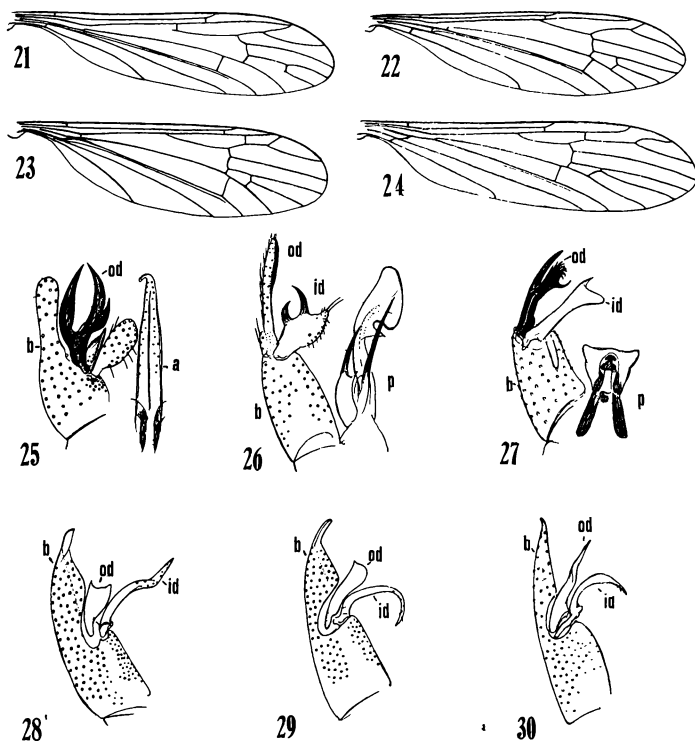


Fig. 21. *Gonomyia (Idiocera) proserpina* sp.n.; venation. Fig. 22. *Gonomyia (Gonomyia) bihamata* sp.n.; venation. Fig. 23. *Erioptera (Gonempeda) yellowstonensis* sp.n.; venation. Fig. 24. *Erioptera (Empeda) tristimonia* sp.n.; venation. Fig. 25. *Gonomyia (Idiocera) proserpina* sp.n.; male hypopygium. Fig. 26. *Gonomyia (Gonomyia) bihamata* sp.n.; male hypopygium. Fig. 27. *Erioptera (Empeda) tristimonia* sp.n.; male hypopygium. Fig. 28. *Erioptera (Gonempeda) yellowstonensis* sp.n.; male hypopygium. Fig. 29. *Erioptera (Gonempeda) burra* Alexander; male hypopygium. Fig. 30. *Erioptera (Gonempeda) nyctops* Alexander; male hypopygium. (Symbols: a, aedeagus; b, basistyle; id, inner dististyle; od, outer dististyle; p, phallosome.)

grayish subhyaline, restrictedly patterned with brown, as in the group, including areas at arculus; origin of  $R_5$ ; fork of  $Sc$ ; stigma; along cord; fork of  $M_{1+2}$ , and the outer radial field in cells  $R_3$  and  $R_4$ ; veins brown. Venation:  $Sc$  relatively long,  $Sc_1$  ending shortly beyond midlength of  $R_5$ ,  $Sc_2$  near its tip;  $R_5$  long, angulated and spurred at origin; veins  $R_{1+2}$  and  $R_3$  confluent at margin, closing cell  $R_1$ ;  $m-cu$  more than its own length before the fork of  $M$ .

Abdomen dark brown, including the hypopygium, the posterior and lateral borders of the tergites narrowly yellow. Male hypopygium (Fig. 25) with the outer lobe of basistyle,  $b$ , pale, its tip obtuse, with setae throughout the length. Outer dististyle,  $od$ , entirely blackened, profoundly bifid into two pincer-like arms, the outer one simple, terminating in an acute black point; inner arm of approximately similar shape, its tip acute, on inner margin at near midlength bearing a subappressed lateral spine; apex of main stem just at fork with several microscopic setulae. Inner dististyle a pale yellow compressed blade, the apex subtruncate to obtuse, the surface provided with numerous coarse setae; at base of style with a further flattened blade or edge that terminates in a narrowly triangular chitinized point. Aedeagus,  $a$ , elongate, relatively narrow, pale throughout, the apex a short recurved point; surface with many setae, especially on margin and on distal half.

*Holotype*, ♂, Emerald Pool, 7,275 ft., June 30, 1941 (C. P. Alexander).  
*Allotopotype*, ♀, with the type. *Paratopotypes*, 10 ♂ ♀, with the types.

*Gonomyia (Idiocera) proserpina* is quite different from all other members of the *blanda (sexguttata)* group, especially in the structure of the male hypopygium, as the outer lobe of the basistyle and the pincer-like nature of the outer dististyle. The fly was not uncommon on low vegetation along the small woodland stream at Emerald Pool, especially in the *Ledum* area.

*Gonomyia (Idiocera) coloradica* Alexander, 1920.—Old Faithful Geyser, 7,300 ft., June 30, 1941; Emerald Pool, 7,275 ft., June 30, 1941.

*Gonomyia (Gonomyia) bihamata* sp. nov. — Allied to *extensivena*; rostrum obscure brownish yellow; antennae black throughout, relatively long; head dark gray; scutellum extensively obscure yellow; thoracic pleura yellow, patterned with brown on mesepisternum; wings grayish subhyaline, the stigma faintly darkened;  $Sc$  relatively long,  $Sc_1$  ending a short distance beyond origin of  $R_5$ ; male hypopygium with the inner dististyle bearing two powerful black spines along the caudal border.

♂. Length, about 4.5-5 mm.; wing, 4.6-6.1 mm.

♀. Length, about 5.5-6 mm.; wing, 6-7 mm.

Rostrum obscure brownish yellow; palpi black. Antennae moderately long; scape and pedicel black, the basal flagellar segments a trifle paler, the outer segments passing into black; basal flagellar segments oval, the outer ones passing into elongate-cylindrical. Head dark gray; eyes (male) large, the anterior vertex correspondingly narrowed.

Pronotum bright yellow above, darker laterally; pretergites similarly light yellow. Mesonotal praescutum chiefly covered by confluent brownish gray stripes, the humeral region and broad lateral borders yellow; scutum yellow, the lobes extensively blackened, sparsely pruinose; scutellum obscure yellow, narrowly darkened across the cephalic border, parascutella dark; mediotergite with the central portion dark gray, the marking narrowed behind, the broad lateral margins yellow; pleurotergite yellow. Pleura light yellow, patterned with reddish brown to brown on the anepisternum and ventral sternopleurite. Halteres relatively long, stem pale yellow, knob infuscated. Legs with the coxae and trochanters yellow; remainder of legs brown, the tarsi passing into black. Wings (Fig. 22) grayish subhyaline, the prearcular and costal fields slightly more whitened; stigma very faintly darkened to scarcely indicated; veins dark brown. Venation:  $Sc_1$  ending a short distance beyond origin of  $R_s$ , in cases to one-fourth or one-fifth the length of the latter,  $Sc_2$  near its tip;  $R_{2+3+4}$  arcuated, a little shorter than  $R_s$ ; cell 1st  $M_2$  closed;  $m-cu$  unusually variable in position, in cases a short distance before the fork of  $M$ , in other cases up to one-third its length beyond the fork.

Abdominal tergites dark brown, the lateral tergal borders and the basal sternites more yellowish; outer sternites a little more darkened; hypopygium obscure yellow. Male hypopygium (Fig. 26) with the outer lobe of basistyle,  $b$ , a small oval pale lobe. Outer dististyle,  $od$ , long and slender, the distal third to half on mesal face with a glabrous dusky edge or flange, much as in *extensivena*. Inner dististyle,  $id$ , complex, the caudal portion produced into two powerful curved blackened spines; apex of style a cylindrical lobe that terminates in the usual two fasciculate bristles. Phallosome,  $p$ , much as in *extensivena*, the aedeagus widely expanded and flaring at apex, subtended by two unequal blackened spines or apophyses.

*Holotype*, ♂, Emerald Pool, 7,275 ft., June 29, 1941 (C. P. Alexander). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, 1 ♀, pinned with type; several additional ♂ ♀, June 29-30, 1941; *paratypes*, 1 ♂, Elk Park, 7,000 ft., June 28, 1941; 1 ♂, Northeast Entrance, 7,200 ft., June 26, 1941.

Although closely allied to *Gonomyia* (*Gonomyia*) *extensivena* Alexander, 1943, of the central Rocky Mountain region, the present fly is evidently distinct, differing especially in the structure of the male hypopygium, notably of the inner dististyle which bears two distinct powerful spines instead of the single spinous blade of *extensivena*.

*Gonomyia* (*Gonomyia*) *flavibasis* Alexander, 1916.—Emerald Pool, 7,275 ft., June 29 and 30, 1941, abundant.

*Erioptera* (*Mesocyphona*) *distincta* Alexander, 1912. — Gibbon Canyon, Yellowstone, July 22, 1929 (M. D. Leonard). This species is closely allied to *E. (M.) splendida* Alexander, 1913, of Central America, and the records of distribution for the two have been confused.

*Erioptera* (*Mesocyphona*) *dulcis* Osten Sacken, 1877. — Emerald Pool, 7,275 ft., June 29 and 30, 1941.

*Erioptera (Hoplolabis) rainieria* Alexander, 1943.—Emerald Pool, 7,275 ft., in *Ledum glandulosum* association, June 29, 1941.

*Erioptera (Erioptera) septemtrionis* Osten Sacken, 1859.—Emerald Pool, 7,275 ft., June 29, 1941.

*Erioptera (Erioptera) villosa* Osten Sacken, 1859.—Emerald Pool, 7,275 ft., June 29 and 30, 1941.

*Erioptera (Helobia) cana* (Walker, 1848).—Obsidian Creek, 7,300 ft., June 27, 1941; Emerald Pool, 7,275 ft., June 29, 1941.

*Erioptera (Gonempeda) yellowstonensis* sp. nov.—General coloration of mesonotum light brown, the pleura pale yellow, variegated with pale brown; legs light brown, the outer segments blackened; wings subhyaline, the stigma faintly darkened; male hypopygium with the apical blade of basistyle darkened, the apex cultrate; outer dististyle small, subquadrate, both outer angles more or less produced, the outer one an acute spine; inner dististyle strongly sinuous, blackened.

♂. Length, about 3.2-3.5 mm.; wing, 4.3-4.5 mm.

Rostrum obscure yellow; palpi dark brown. Antennae brownish black; basal segments crowded, the outer ones elongate. Head brownish yellow to pale brown.

Pronotum weakly infuscated above, yellow on sides; scutellum chiefly pale yellow. Mesonotum light brown, very sparsely pruinose; lateral and humeral portions of praescutum pale yellow; posterior sclerites of notum somewhat paler. Pleura pale yellow, variegated with pale brown on anepisternum, ventral sternopleurite and meron; pteropleurite without setae, as in the subgenus. Halteres pale yellow, the apex of knob infuscated. Legs with the coxae and trochanters testaceous yellow; remainder of legs light brown, the outer segments passing into black. Wings (Fig. 23) subhyaline, the stigma faintly darkened; veins pale brownish yellow. Venation:  $Sc_1$  ending about opposite one-third to one-half the length of  $R_{2+3+4}$ ,  $Sc_2$  nearly opposite the end of  $Rs$ ;  $R_{2+3+4}$  shorter than  $R_{3+4}$ ; vein  $R_3$  oblique, straight, as in the subgenus;  $m-cu$  beyond the fork of  $M$ , the distance somewhat variable, in cases up to nearly its own length.

Abdomen pale brown, the hypopygium slightly more yellowish brown. Male hypopygium (Fig. 28) of the general type of the subgenus, that is, the basistyle,  $b$ , produced into a long flattened glabrous point or blade beyond the point of insertion of the dististyles. Blade of basistyle,  $b$ , flattened-compressed, the narrow apex cultrate, blackened; setae of basistyle very long and conspicuous, especially those beyond the point of insertion of the dististyles. Outer dististyle,  $od$ , a small flattened subquadrate blade, the outer apical angle an acute spine, the larger inner apical angle more obtuse. Inner dististyle,  $id$ , a long strongly sinuous blackened rod that gradually narrows to a subacute apex; distal half with scattered relatively short setae.

*Holotype*, ♂, Emerald Pool, 7,275 ft., June 30, 1941 (*C. P. Alexander*).  
*Paratopotype*, 1 ♂, June 29, 1941; *paratypes*, 2 ♂♂, 1 ♀, Obsidian Creek, 7,300 ft., June 27, 1941; 1 ♀, Canyon Camp, 7,800 ft., June 21, 1941.

*Erioptera (Gonempeda) yellowstonensis* is quite distinct from the two Nearctic species of the subgenus *Gonempeda* Alexander so far described. The chief features differentiating these various species are found in the structure of the male hypopygium and I have here illustrated the styli for the three species in question. *E. (G.) burra* Alexander, 1924, is most similar to the present fly; cultrate blade of basistyle (Fig. 29, *b*) and both dististyles pale; outer dististyle, *id*, with the inner apical angle not produced; inner dististyle, *id*, a long sickle-shaped rod (The specimen figured is not the type but is believed to be conspecific). *E. (G.) nyctops* Alexander, 1916, has the basistyle (Fig. 30, *b*) much more slender, especially beyond the point of insertion of the dististyles; both dististyles elongate, the outer one a long sinuous rod, the tip acute.

*Erioptera (Empeda) tristimonia* sp. nov.—General coloration blackened, heavily pruinose; antennae black throughout; halteres with yellow knobs; wings with a weak brown tinge, the prearcular field more whitened; stigmal region very faintly darkened; veins  $R_3$  and  $R_4$  generally longitudinal in position, cell  $R_3$  relatively short; cell 1st  $M_2$  closed; vein 2nd *A* straight; male hypopygium with the basistyle not produced caudad beyond the level of origin of the dististyles; outer dististyle blackened, forked, the lateral branch with several slender spines.

♂. Length, about 3.5 mm.; wing, 4.5 mm.; antenna, about 0.8 mm.

♀. Length, about 4 mm.; wing, 5 mm.

Rostrum and palpi black. Antennae black throughout, relatively short; flagellar segments oval, the outer ones becoming more elongate; terminal segment subequal in length to the penultimate and a little stouter; verticils of basal flagellar segments elongate, about twice the length of the segments, of the outer segments about one-half longer than the segments. Head blackish, sparsely pruinose.

Prothorax and mesothorax uniformly blackened, heavily gray pruinose to conceal the ground; pretergites and dorsopleural region darkened. Pleura, including the pteropleurite, without setae. Halteres with stem testaceous, knob yellow. Legs with the coxae gray pruinose; trochanters obscure yellow. The posterior pair darker; femora obscure yellow basally, the tips broadly dark brown; tibiae chiefly yellow, the tips weakly darkened; tarsi obscure yellow, the outer segments blackened; legs without scales among the relatively short sparse setae. Wings (Fig. 24) with a weak brownish tinge, the prearcular and basal costal field more whitened; stigmal region very faintly and indistinctly darkened; veins brown, more yellowish at the wing-base. All longitudinal veins beyond base, excepting  $Cu_2$ , with macrotrichia. Venation: *Sc* relatively long,  $Sc_1$  ending about opposite two-thirds the length of *Rs*,  $Sc_2$  about twice its own

length from the tip;  $R_5$  strongly arcuated; cell  $R_3$  relatively short, the enclosed branches longitudinal in position,  $R_3$  short and sinuous,  $R_4$  nearly straight;  $R_2$  more than its own length beyond the fork of  $R_5$ , in cases more than twice its length; cell  $1st\ M_2$  closed,  $m$  much shorter than the basal section of  $M_3$ ;  $m-cu$  before the fork of  $M$ ; vein  $2nd\ A$  straight.

Abdomen black, heavily gray pruinose; hypopygium black. Ovipositor with valves long and conspicuous, horn-yellow. Male hypopygium (Fig. 27) with both dististyles apical in position, the basistyle,  $b$ , not conspicuously produced beyond their bases. Outer dististyle,  $od$ , blackened and heavily sclerotized, conspicuously branched; lateral branch stouter than the axis beyond it, the outer portion with several slender curved spines, with a further single strong spine on the lower outer angle, the space between these spines circular or oval in outline. Inner dististyle,  $od$ , subequal in size to the outer, entirely pale, the apex an obtuse lobe, on outer margin before tip produced into an acute spine. Phallosomic plate,  $p$ , slightly expanded outwardly, the outer lateral angles narrowly obtuse to subacute.

*Holotype*, ♂, Obsidian Creek, 7,300 ft., June 27, 1941 (C. P. Alexander). *Allotopotype*, ♀, pinned with type. *Paratopotype*, 1 ♀, pinned with type.

Edwards (Trans. Soc. British Ent., 5: 1-168, 31 figs., with numerous subfigures, 5 pls.; 1938) considers that *Cheilotrichia* Rossi, 1848; *Gonempeda* Alexander, 1924, and *Empeda* Osten Sacken, 1869, represent three subgenera under the oldest name, *Cheilotrichia*. I prefer to consider all three names as representing valid subgenera under *Erioptera* Meigen, 1803. The present fly is closest to *Erioptera* (*Empeda*) *alicia* Alexander, 1914, differing conspicuously in the blackish gray body coloration and in all other details of color. Both of these species have cell  $1st\ M_2$  closed, in this respect agreeing with the typical form of *Cheilotrichia* but it seems advisable to refer these two Nearctic species to *Empeda* rather than to *Cheilotrichia* on the basis of lack of setae on the pteropleura.

*Ormosia* (*Ormosia*) *garretti* Alexander, 1926. — Sylvan Lake, 8,000 ft., along small mountain stream, June 21, 1941. New to the United States. The normal venation of the species is shown (Fig. 31); one male specimen has cell  $M_2$  of both wings open by the atrophy of  $m$  (Fig. 32).

*Ormosia* (*Ormosia*) *opifex* sp. nov.—General coloration brown, sparsely pruinose; antennae (male) moderately long, flagellum pale brown; flagellar segments covered with a dense erect pale pubescence, the more proximal segments with very elongate verticils; legs brown; wings grayish subhyaline; cell  $M_2$  open by atrophy of  $m$ ; Anal veins strongly divergent,  $2nd\ A$  straight; male hypopygium with the ninth tergite entire, the caudal margin truncate; outer dististyle a sinuous blackened rod; inner dististyle complex, the lateral portion blackened, produced into a spinous horn, the inner blade expanded, yellow, its margin bearing 9 or 10 elongate setae; gonapophyses appearing as two flattened pale blades.

♂. Length, about 4.5-4.7 mm.; wing, 5.2-5.3 mm.; antenna, about 1.5 mm.

Rostrum and palpi brown. Antennae moderately long; scape and pedicel dark brown, flagellum paler brown; flagellar segments somewhat fusiform with truncated ends, covered with a dense erect pale pubescence; the more basal flagellar segments provided with verticils of unusual length, the longest (flagellar segments 3 or 4) nearly four times the length of the segment, on outer segments these verticils shorter and inconspicuous. Head brownish gray.

Pronotum dark brown; anterior lateral pretergites whitened. Mesonotum almost uniformly brown with a restricted gray bloom, not or scarcely patterned. Pleura brown. Halteres yellow throughout. Legs with the coxae pale brown; trochanters yellow; remainder of legs brown. Wings (Fig. 33) grayish subhyaline, the extreme base a trifle more yellow; veins very pale brown, the macro-

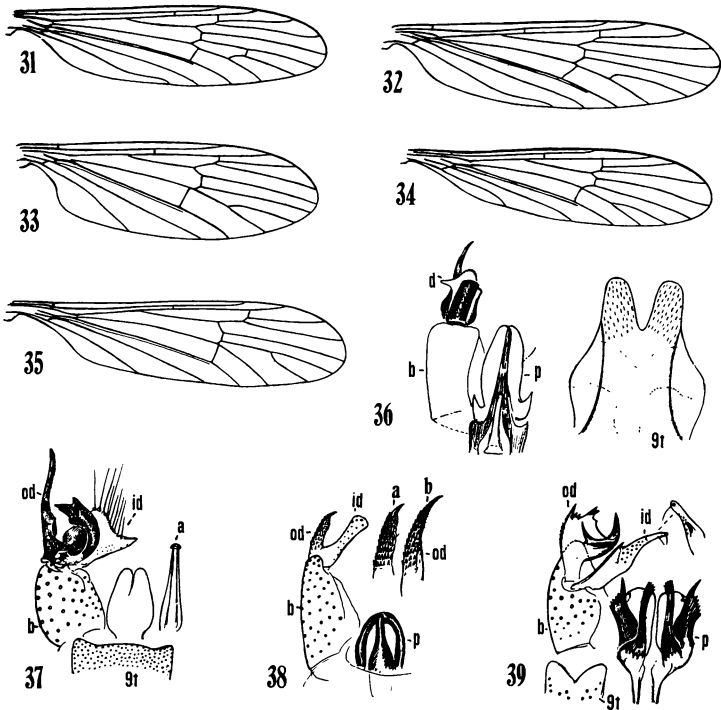


Fig. 31. *Ormosia (Ormosia) garretti* Alexander; normal venation. Fig. 32. The same; abnormal venation. Fig. 33. *Ormosia (Ormosia) opifex* sp.n.; venation. Fig. 34. *Ormosia (Ormosia) absaroka* sp.n.; venation. Fig. 35. *Ormosia (Ormosia) sentis* sp.n.; venation. Fig. 36. *Ormosia (Ormosia) divergens* (Coquillett); male hypopygium. Fig. 37. *Ormosia (Ormosia) opifex* sp.n.; male hypopygium. Fig. 38. *Ormosia (Ormosia) absaroka* sp.n.; male hypopygium. Fig. 39. *Ormosia (Ormosia) sentis* sp.n.; male hypopygium. (Symbols: a, aedeagus; b, basistyle; d, dististyle; g, gonapophysis; id, inner dististyle; od, outer dististyle; p, phallosome; t, 9th tergite.)

trichia a trifle darker. Macrotrichia abundant and long, well distributed over the wing surface near the wing base. Venation: Cells beyond cord relatively deep;  $M_2$  open by atrophy of  $m$ ; Anal veins divergent,  $2nd\ A$  straight on outer two-thirds, the cell wide.

Abdomen, including hypopygium, brown. Male hypopygium (Fig. 39) with the caudal margin of tergite,  $9t$ , entire, generally truncate or with the central portion gently convex. Outer dististyle,  $od$ , a sinuous black rod, the basal half stouter, the outer portion slender, its mesal margin and apex slightly roughened. Inner dististyle,  $id$ , complex in structure, consisting of an outer or lateral more blackened portion that is produced laterad and caudad into a conspicuous spinous horn; inner portion a dilated yellow blade that narrows at apex into a triangular lobe or blade, the outer margin with nine or ten very long pale setae. Gonapophyses appearing as flattened blades, widest across their cephalic portion.

*Holotype*, ♂, Sylvan Lake, 8,000 ft., June 21, 1941 (C. P. Alexander).  
*Paratopotype*, ♂. Taken along a small mountain stream in the lodgepole pine forest.

The only species with which the present fly requires comparison is *Ormosia* (*Ormosia*) *divergens* (Coquillett, 1905), described from British Columbia. The original description of this latter species is very brief and includes few definite characters. The description of the male hypopygium reads "rather small, the claspers terminate in a curved hook." I am indebted to Dr. Alan Stone of the United States National Museum for making a mount of the male hypopygium of the only male in the type series and sending me a careful drawing of the organ. I have copied this (Fig. 36) in order to compare the species with the present fly. From the drawing it can be seen that the dististyles of the hypopygium, while appearing quite distinct from those of *opifex*, could conceivably be so mounted as to present this different aspect. However, the details of the styli and especially the structure of the ninth tergite,  $9t$ , show the fly to be a distinct species. The large tergite, with the caudal margin deeply notched, is entirely different from the condition found in *opifex*.

It may be observed that there are several distinct groups in *Ormosia* where cell  $M_2$  is open by the atrophy of  $m$  rather than the commoner condition of being open by the atrophy of the basal section of vein  $M_3$ . These groups include:

1. The *holotricha* group. *O. holotricha* (Osten Sacken, 1859).
2. The *flaveola* group. *O. flaveola* (Coquillett, 1900); *O. absaroka* sp. nov., and several species in Eastern Asia.
3. The *nigripila* group. *O. nigripila* (Osten Sacken, 1869), together with several other species in North America and Eastern Asia.
4. The *divergens* group. *O. divergens* (Coquillett, 1905) and very possibly the present fly.



*Ormosia (Ormosia) absaroka* sp. nov.—Belongs to the *flaveola* group; general coloration dark brownish gray, including the head and mesonotum; antennae very short, black throughout; halteres yellow; legs dark brown to brownish black, the femoral bases not or scarcely brightened; wings with a brown suffusion, their bases more yellowish; male hypopygium with the outer dististyle strongly roughened by microscopic denticles.

♂. Length, about 4.4-4.3 mm.; wing, 4.2-5 mm.; antenna, about 0.7-0.75 mm.

♀. Length, about 4.6-5 mm.; wing, 5-5.5 mm.

Rostrum and palpi brownish black. Antennae black, very short in both sexes; basal flagellar segments oval, the outer ones even shorter; verticils about as long as the segments. Head gray; anterior vertex wide.

Thoracic dorsum chiefly dark brownish gray, the sides of the pronotum, lateral pretergites and restricted humeral portions of praescutum more testaceous to yellow; pseudosutural foveae and tuberculate pits black. Pleura dark brown, sparsely pruinose. Halteres yellow, the base of stem restrictedly more darkened. Legs with the coxae and trochanters brown; remainder of legs dark brown to brownish black, the femoral bases not or scarcely brightened. Wings (Fig. 34) with a brown suffusion, the prearcular and costal fields more yellowish; veins and macrotrichia pale brown; veins in the brightened portions of wing more yellowish. Venation: Basal portions of wing narrowed, restricting the cells, cells 2nd *A* being unusually narrow; cell  $M_2$  open by atrophy of *m*, cell  $M_3$  relatively deep; *m-cu* at or very close to the fork of *M*.

Abdomen dark brown, the hypopygium obscure yellow. Male hypopygium (Fig. 38) of very simple construction, as in the group. Outer dististyle, *od*, a simple blackened rod that narrows to an acute terminal spine, the outer surface with abundant subappressed microscopic denticles. Inner dististyle longer, pale yellow, the apex a little expanded. Phallosome, *p*, appearing as an unbroken oval sclerotized plate overlain by the stout aedeagus. In the paratype from British Columbia, the outer dististyle is longer and more attenuated (Fig. 38, B); whether this represents a distinct species or subspecies or merely an extreme condition within the limits of the present fly cannot be decided at this time.

*Holotype*, ♂, Sylvan Lake, Yellowstone, 8,000 ft., June 21, 1941 (C. P. Alexander). *Allotopotype*, ♀, with the type. *Paratopotypes* 4 ♂♂, with the types; *paratypes*, 10 ♂♀, Moscow, Idaho, April 19, 1913 (J. M. Aldrich, in U. S. N. M.); Terrace, British Columbia, April 15, 1940 (Mrs. M. E. Clark); several ♂♀, Twogwotee Pass, Wyoming, 9,650 ft., July 9, 1942 (C. P. Alexander).

Named for the Absaroka (Crow) Indians, inhabiting the type locality of the species. The nearest related ally is *Ormosia (Ormosia) flaveola* (Coquillett, 1900), described from Alaska (June 27, 1899; Kincaid). This latter fly differs especially in the yellow coloration of the body, the distinctly longer antennae, and in slight details of structure of the male hypopygium. This structure of the holotype has been mounted and a careful drawing made for me by Dr. Alan Stone, to whom my very deep thanks are extended for many

favors. Other described species in Japan and Corea include *O. (O.) confluenta* Alexander, 1922, and *O. (O.) yankovskii* Alexander, 1940.

*Ormosia (Ormosia) sentis* sp. nov.—Allied to *meigenii*; general coloration dark brownish gray; antennae black throughout, relatively short; longest verticils unilaterally distributed; halteres yellow; legs brown; wings brownish yellow, restrictedly patterned with brown, most evident as a stigmal darkening; cell  $M_2$  open by the atrophy of the basal section of  $M_3$ ; Anal veins chiefly divergent, *2nd A* very weakly sinuous on its apical portion; male hypopygium with the outer dististyle a massive structure provided with several spinous points; both gonapophyses spinous at tips, the inner pair with a semicircle of strong blackened spines near base.

♂. Length, about 3.5-4 mm.; wing, 4.4-8 mm.; antenna, about 1.1 mm.

♀. Length, about 4.5 mm.; wing, 4.5-4.8 mm.

Rostrum brown; palpi black. Antennae relatively short, brownish black throughout; flagellar segments with the longest verticils unilaterally distributed, much longer on the subbasal segments. Head dark gray.

Pronotum brownish gray, the pretergites pale yellow. Mesonotum dark brownish gray; pseudosutural foveae and tuberculate pits black. Pleura brownish gray, the dorsopleural membrane somewhat more buffy. Halteres yellow. Legs with the coxae brownish yellow; trochanters obscure yellow; femora obscure yellow, the tips passing into brownish black; tibiae and tarsi light brown, the outer tarsal segments blackened. Wings (Fig. 35) with a brownish yellow ground, restrictedly patterned with brown, most evident in the unusually distinct stigma; much narrower brown seams at origin of  $R_5$ ,  $Sc_2$  along cord and outer end of cell  $M_2$ ; a very restricted darkening on apical wing margin, chiefly produced by tiny brown areas at ends of longitudinal veins; prearcular and costal fields a trifle more yellow; veins brown, more yellowish brown in the brightened basal portions. Macrotrichia of cells very pale brown, abundant. Venation: Cell  $M_2$  open by atrophy of basal section of  $M_3$ ; a more or less distinct spur of a vein jutting basad from point of union of  $m$  and outer section of  $M_3$ ; Anal veins chiefly divergent, the extreme tip of *2nd A* a little sinuous but scarcely affecting the widening of cell *1st A* at margin.

Abdomen, including hypopygium, brownish black to black. Male hypopygium (Fig. 39) with the tergite, *9t*, produced medially, its caudal border pale, with a broad V-shaped notch. Basistyle, *b*, at apex produced into a short obtusely rounded lobe. Outer dististyle, *od*, a massive blackened structure provided with several spinous points; outer margin microscopically scabrous; inner spine or horn very powerful; as would be expected in a multispinous structure such as this, there is considerable variation in the number and relative size of the spines. Inner dististyle, *id*, subequal in length to the outer but slender, the basal half broader, the distal portion slender, its tip narrowly obtuse; outer margin at point of narrowing with an acute spinous point. Phallosome, *p*, appearing as flattened blades that are produced into four gona-

pophyses, all with the tips denticulate; outer pair of apophyses broader and flatter, produced at apex into a longer, more spinous portion; inner pair of apophyses chiefly toothed at apex only but with a semicircle of stronger spines near base.

*Holotype*, ♂, Obsidian Creek, 7,300 ft., June 27, 1941 (C. P. Alexander). *Allotopotype*, ♀, June 24, 1941. *Paratopotypes*, 3 ♂♂, June 24-27, 1941; *paratypes*, 1 ♂, 5 ♀♀, Arizona Creek, Grand Teton National Forest, Wyoming, 6,800 ft., July 4, 1942 (C. P. Alexander).

The nearest regional ally of the present fly appears to be *Ormosia* (*Ormosia*) *subcornuta* Alexander, 1920, of the Pacific Northwest. This and other generally similar forms that are allied to the eastern Nearctic *O.* (*O.*) *meigenii* (Osten Sacken, 1859), differ conspicuously in the structure of the male hypopygium.

***Ormosia* (*Ormosia*) *spinifex* sp. nov.** — Allied to *meigenii*; general coloration dark gray; antennae of moderate length, black throughout; halteres yellow; legs dark brown, the femoral bases obscure yellow; wings with a brownish tinge, the stigma distinct; cell  $M_2$  open by atrophy of basal section of  $M_3$ ; vein *2nd A* gently sinuous on distal half, cell *1st A* widest at margin; male hypopygium with the dististyle complex, bearing several blackened spinous points; aedeagus slender, terminating in two divergent blackened horns; gonapophyses appearing as flattened blackened blades, at base with a single erect black spine.

♂. Length, about 4.5-5 mm.; wing, 5.5-6 mm.; antenna, about 1.3-1.4 mm.

♀. Length, about 5-5.5 mm.; wing, 6-6.2 mm.

Rostrum dark brown, pruinose; palpi black. Antennae black throughout, of moderate length; flagellar segments long-oval, with a dense white pubescence and conspicuous verticils, the longest of which are unilaterally distributed. Head dark gray.

Pronotum dark brownish gray. Mesonotum chiefly dark gray, the praescutum without stripes, the pretergites restrictedly yellow. Pleura similarly gray, a little brighter immediately in front of wing-root. Halteres uniformly pale yellow. Legs with the coxae and trochanters yellow; remainder of legs dark brown, the femoral bases obscure yellow; outer tarsal segments somewhat more blackened. Wings (Fig. 40) with a brownish tinge, the prearcular and basal costal fields a little more brightened; stigma conspicuous, darker brown; veins brown, a little more yellowish in the basal portions. Macrotrichia of cells distributed over the entire wing. Venation:  $R_{1+2}$  variable in position, from a short distance before the fork of  $R_{2+3}$  to a corresponding distance beyond the fork; cell  $M_2$  open by atrophy of basal section of  $M_3$ ; *m-cu* close to fork of  $M$ ; vein *2nd A* gently sinuous on distal half, cell *1st A* widest at the margin.

Abdomen dark brown, including the hypopygium. Male hypopygium (Fig. 44) with the tergal plate, *9t*, gently widened outwardly, the caudal margin

subtruncate, with a small median notch; surface of tergite with abundant short setulae and, on basal half, several unusually long and strong setae. Dististyle, *d*, complex, terminating in an outer blackened spine and a slightly more cephalic flat blackened apical blade; on face of style with a compound blackened structure that terminates in two strong black spinous points, these somewhat variable in length in different specimens; at base of style on mesal face with a small oval pale cushion that may represent a distinct outer dististyle. Aedeagus, *a*, a slender blackened rod that terminates in two divergent slender black horns that are strongly recurved, the apex between these horns with four or five small blackened points. Gonapophyses appearing as narrow flattened black blades, their tips obtuse, near base of each with a single erect black spine.

*Holotype*, ♂, Northeast Entrance, 7,200 ft., June 26, 1941 (*C. P. Alexander*). *Allotopotypes*, ♀, with the type. *Paratopotypes*, 3 ♂ ♀, June 24-26, 1941; *paratypes* several ♂ ♀, Sylvan Lake, 8,000 ft., June 21, 1941; ♂ ♀, Big Horn Mts., Wyoming, near Steamboat Rock, June 19, 1941 (*C. P. Alexander*).

From the other generally similar regional species that have cell  $M_2$  of wings open by the atrophy of the basal section of  $M_3$  and vein 2nd *A* sinuous, the present fly is readily distinguished by the structure of the male hypopygium, notably the dististyles, gonapophyses and aedeagus.

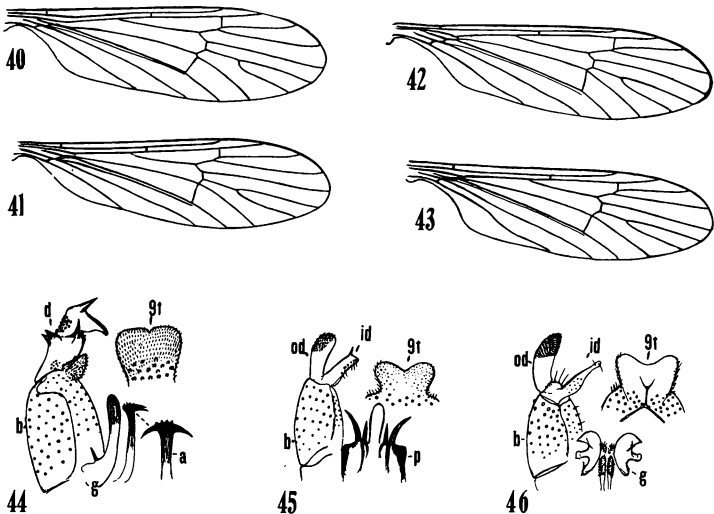


Fig. 40. *Ormosia (Ormosia) spinifex* sp.n.; venation. Fig. 41. *Ormosia (Ormosia) dedita* sp.n.; venation. Fig. 42. *Ormosia (Ormosia) albertensis* Alexander; venation. Fig. 43. *Ormosia (Ormosia) onerosa* sp.n.; venation. Fig. 44. *Ormosia (Ormosia) spinifex* sp.n.; male hypopygium. Fig. 45. *Ormosia (Ormosia) dedita* sp.n.; male hypopygium. Fig. 46. *Ormosia (Ormosia) onerosa* sp.n.; male hypopygium. (Symbols: *a*, aedeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *id*, inner dististyle; *od*, outer dististyle; *p*, phallosome; *t*, 9th tergite.)

*Ormosia (Ormosia) dedita* sp. nov. — Belongs to the *similis* group; allied to *adirondacensis*; general coloration dark plumbeous gray; antennae short; halteres yellow; legs dark brown, the femoral bases restrictedly brightened; wings with a brownish tinge, the stigma darker; Anal veins divergent, vein *2nd A* straight; male hypopygium with the inner dististyle bearing a small spine or tooth on outer margin before apex; phallosome consisting of a pale oval blade subtended by two pairs of apophyses terminating in acute blackened spines.

♂. Length, about 4.5-5 mm.; wing, 5-5.6 mm.; antenna, about 0.9-1.0 mm.

Rostrum and palpi black. Antennae short; basal segments black, the outer ones somewhat paler; flagellar segments oval, the longest verticils unilaterally distributed. Head dark gray.

Pronotum brownish black, sparsely pruinose; pretergites restrictedly pale brown. Mesonotum dark plumbeous gray, without evident stripes, the praescutal interspaces indicated by conspicuous yellow setae. Pleura dark plumbeous. Halteres yellow. Legs with the coxae testaceous yellow, the fore pair somewhat darker; trochanters yellow; remainder of legs dark brown, the femoral bases restrictedly brightened. Wings (Fig. 41) with a brownish tinge, the proximal portion of the costal region and the stigma darker brown; veins dark brown. Macrotrichia of cells well-distributed over the entire disk. Venation: Cell  $M_2$  open by atrophy of basal section of  $M_3$ ; *m-cu* slightly variable in position, in cases close to the fork of  $M$ , in others a short distance before the fork; Anal veins divergent, vein *2nd A* straight.

Abdomen, including hypopygium, brownish black. Male hypopygium (Fig. 45) with the tergal lobe, *9t*, unusually short and broad, the caudal margin broadly emarginate, the lateral lobes broadly obtuse. Outer dististyle, *od*, long-oval in outline, the distal third provided with about seven rows of appressed spines to completely cover or shingle the apex of style. Inner dististyle, *id*, of approximately the same length as the outer, broadest at base, narrowed on distal half, on outer margin before apex bearing an acute spine, this sometimes reduced to a short stub; lower or mesal portion of style more membranous and provided with several conspicuous punctures that bear setae of moderate length. Phallosome, *p*, consisting of a very pale oval blade, subtended on either side by two pairs of apophyses, the outer pair longer, dilated basally, the acute spinous tips slightly divergent; inner apophyses shorter and straighter, lying nearly parallel to one another.

*Holotype*, ♂, Northeast Entrance, 7,200 ft., June 26, 1941 (C. P. Alexander). *Paratopotypes*, 4 ♂♂.

*Ormosia (Ormosia) dedita* has the dististyles of the male hypopygium much like those of *O. (O.) adirondacensis* Alexander, 1919, and *O. (O.) brevicarata* Alexander, 1927, of eastern North America, but the structure of the phallosome is entirely different.

*Ormosia (Ormosia) albertensis* Alexander, 1933. — Northeast Entrance,

June 24, and 26, 1941. Not before recorded from the United States. The wing venation is illustrated (Fig. 42).

**Ormosia (Ormosia) onerosa** sp. nov. — Belongs to the *similis* group; allied to *mesocera*; mesonotum chiefly brownish black, sparsely pruinose; antennae short in both sexes; wings with a weak brown tinge; vein *2nd A* strongly sinuous; male hypopygium with the inner dististyle unusually slender, dilated on basal half; gonapophyses appearing as flattened blades, their apices acutely pointed, bent laterad.

♂. Length, about 4.4-3 mm.; wing, 4.7-5.2 mm.; antenna, about 1-1.1 mm.

♀. Length, about 4.5 mm.; wing, 5 mm.

Rostrum and palpi black. Antennae short, if bent backward scarcely reaching the wing root, black throughout; basal flagellar segments oval, the outer ones becoming elongate; verticils of the more proximal segments very long, exceeding twice the length of the segments. Head dark gray.

Pronotum obscure brownish yellow to brown; pretergites pale whitish yellow. Mesonotum chiefly brownish black, sparsely pruinose, the humeral and lateral portions of praescutum, dorsal part of pleurotergite and anterolateral portion of mediotergite obscure yellow. Pleura extensively brownish gray, in cases with more or less yellow on the metapleura and dorsal sternopleurite. Halteres weakly darkened, the base of stem paler, the apex of knob whitened. Legs with the coxae and trochanters obscure yellow; femora obscure yellow basally, passing into brown; remainder of legs brown, the outer segments darker. Wings (Fig. 43) with a weak brownish tinge, the stigma slightly darkened; veins and macrotrichia pale brown. Macrotrichia of cells abundant and well-distributed, more sparse to lacking in basal portions of cells *Cu*, *1st A* and *2nd A*. Venation:  $R_2$  a short distance beyond fork of  $R_{2+3+4}$ ; cell  $M_2$  open by atrophy of basal section of  $M_3$ ; vein *2nd A* strongly sinuous.

Abdomen, including hypopygium, dark brown to brownish black. Male hypopygium (Fig. 46) with the ninth tergite, *9t*, extensive, its caudal lobe broad, gently expanded distally, the caudal margin broadly emarginate. Outer dististyle, *od*, suboval in outline, the distal third or more with parallel rows of long slender black spines. Inner dististyle, *id*, unusually slender, a little dilated on basal half, near apex bearing two long pale setae and with further short setae on the expanded portion. Gonapophyses, *g*, appearing as flattened blades, the outer ends (in slide mounts) bent laterad into broad dusky points, the tip acute.

*Holotype*, ♂, Northeast Entrance, 7,200 ft., June 26, 1941 (*C. P. Alexander*). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, 1 ♂, pinned with types; 2 additional ♂♂, June 24-26, 1941.

Closest to *Ormosia (Ormosia) mesocera* Alexander, 1917, and *O. (O.) albertensis* Alexander, 1933, from which it differs in the short antennae in both sexes, the more sinuous vein *2nd A*, and the details of structure of the male hypopygium.

*Molophilus (Molophilus) falcatus* Bergroth, 1888.—Emerald Pool, 7,275 ft., June 29, 1941.

*Molophilus (Molophilus) colonus* Bergroth, 1888.—Emerald Pool, 7,275 ft., swarming June 29 and 30, 1941.

***Molophilus (Molophilus) rostriferus* sp. nov.**—Belongs to the *gracilis* group, *pubipennis* subgroup; general coloration dark plumbeous gray, without differentiated praescutal stripes; antennae short, black throughout; halteres obscure yellow; legs black throughout; wings with a strong brownish yellow tinge, unpatterned; male hypopygium with both dististyles heavily blackened, the outer one larger, expanded outwardly, its outer margin before apex produced into a blackened spine or point.

♂. Length, about 3.5-4 mm.; wing, 3.5-4.8 mm.; antenna, 1-1.1 mm.

♀. Length, about 4.8-5 mm.; wing, 5 mm.

Rostrum black, sparsely pruinose; palpi black. Antennae short, black throughout; flagellar segments oval. Head dark gray; anterior vertex broad.

Pronotum extensively obscure yellow, darkened medially above; anterior lateral pretergites restrictedly yellow. Mesonotum dark plumbeous gray, without markings; humeral triangle of praescutum more reddish brown; pseudo-sutural foveae black; apex of scutellum a little reddened. Pleura dark plumbeous gray, the dorsopleural membrane and a spot before the wing root conspicuously yellow. Halteres obscure yellow. Legs with the coxae and trochanters blackened, the former pruinose; remainder of legs uniformly black. Wings (Fig. 47) with a strong brownish yellow tinge, more saturated yellow in the prearcular and costal fields; veins brown, yellow in the more flavous portions. Vena-

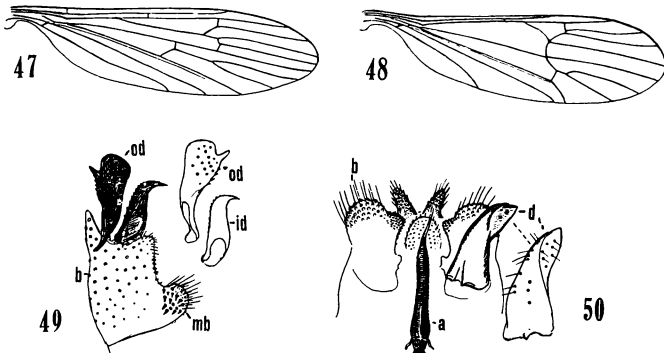


Fig. 47. *Molophilus (Molophilus) rostriferus* sp.n.; venation. Fig. 48. *Cryptolabis (Cryptolabis) molophiloides* sp.n.; venation. Fig. 49. *Molophilus (Molophilus) rostriferus* sp.n.; male hypopygium. Fig. 50. *Cryptolabis (Cryptolabis) molophiloides* sp.n.; male hypopygium. (Symbols: a, aedeagus; b, basistyle; id, inner dististyle; mb, mesal lobe of basistyle; od, outer dististyle.)

tion:  $R_2$  opposite or just before the level of  $r-m$ ; petiole of cell  $M_3$  nearly three times as long as  $m-cu$ ; vein  $2nd A$  gently sinuous.

Abdomen, including hypopygium, black. Male hypopygium (Fig. 49) with the outer lobe of basistyle,  $b$ , relatively small and inconspicuous; mesal lobe,  $mb$ , large, provided with about 15 blackened spinous pegs, the outer margin of lobe with long delicate pale setae; margin of basistyle distad of the lobe with a few scattered black spines. Both dististyles heavily blackened, the outer,  $od$ , larger, expanded outwardly, its outer margin before apex produced into a strong blackened spine or point; margin of style basad of this projection with a few microscopic roughenings; disk of style with several scattered microscopic punctures. Inner dististyle,  $id$ , more slender, the acute tip bent at a right angle to the remainder of style; outer margin usually smooth, in some cases with a few appressed spicules.

*Holotype*, ♂, Elk Park, 7,000 ft., June 28, 1941 (C. P. Alexander). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, 1 ♂, 2 ♀♀; *paratypes*, 2 ♂♂, 2 ♀♀, Upper Falls of the Yellowstone River, 7,500 ft., June 22, 1941; several ♂♀, Twogwotee Pass, Grand Teton National Forest, Wyoming, 9,650 ft., July 9, 1942 (M. M. Alexander); several ♂♀, near Jackson Lake, Wyoming, in a swampy meadow, 6,800 ft., July 5, 1942 (C. P. Alexander).

*Molophilus (Molophilus) rostriferus* is very different from the other regional members of the *pubipennis* subgroup, differing especially in the dark gray coloration, short black antennae, uniformly black legs, and in the structure of the male hypopygium, especially the outer dististyle with its conspicuous beaklike lateral spine. Among such allied species it is apparently most similar to *M. (M.) colonus* Bergroth, 1888,, which differs in the patterned wings and in the structure of the male hypopygium.

**Cryptolabis (Cryptolabis) molophiloides** sp. nov.—General coloration almost uniform brownish black, sparsely pruinose, scutellum more testaceous; thoracic pleura and pleurotergite variegated with obscure yellow; knobs of halteres more or less infuscated; femora pale brown, the tips blackened; wings whitish, restrictedly patterned with darker; wing base more whitened; sparse macrotrichia in outer ends of cells  $R_4$  to  $M_3$ , inclusive;  $R_5$  sinuous, relatively short;  $r-m$  at or before fork of  $R_5$ ; male hypopygium castaneous; dististyle a flattened blade, its margin almost entire, before apex with a more or less distinct notch.

♂. Length, about 3.5-4 mm.; wing, 4-5 mm.

♀. Length, about 4 mm.; wing, about 5-5.5 mm.

Rostrum and palpi dark brown. Antennae brownish black throughout; flagellar segments oval; verticils relatively long. Head dark brown, sparsely pruinose, especially the front and narrow orbits; anterior vertex (male) moderately wide, about twice the diameter of scape.

Pronotum obscure testaceous yellow. Mesonotum almost uniformly brown-



ish black with a gray pruinosity, the praescutum without stripes; scutellum more testaceous, sparsely pruinose; a more or less distinct yellow area on cephalic portion of mediotergite and pleurotergite. Pleura blackened, sparsely pruinose, with a more or less distinct obscure yellow area on the dorsal sternopleurite; dorsopleural area, including lateral portions of praescutum, obscure yellow. Halteres brownish yellow, the knobs more or less infuscated. Legs with the coxae and trochanters pale brown; femora pale brown, the tips gradually but extensively blackened, most extensively so on fore pairs; tibiae and basitarsi pale brown, their tips narrowly darker brown; remainder of tarsi brownish black. Wings (Fig. 48) whitish subhyaline, very restrictedly patterned with brown, including the small stigma, a narrow seam on anterior cord, and a slight axillary darkening; even less evident seams along vein *Cu* and the longitudinal veins beyond cord; prearcular and costal fields more whitened; veins brown, pale in the whitened areas. Macrotrichia of cells relatively extensive but sparse, including series in cells  $R_4$ ,  $R_5$ ,  $M_2$  and  $M_3$ ; in some individuals these more restricted or even lacking in certain of these cells. Venation:  $R_s$  relatively short, strongly sinuous;  $r-m$  at or before the fork of  $R_5$ ;  $m-cu$  at or beyond midlength of  $M_{3+4}$ ;  $R_s$  in longitudinal alignment with  $R_5$  and  $M$  often in alignment with  $M_{1+2}$ , as figured.

Abdomen brownish black, sparsely pruinose; male genitalia slightly more castaneous. Male hypopygium (Fig. 50) about as shown. Dististyle,  $d$ , a flattened blade, broad at base, narrowed to the subobtuse or narrowly acute apex, the margin before apex with a more or less distinct notch; surface of style with relatively numerous setae, those of the outer surface larger and somewhat retrorse. Aedeagus,  $a$ , stout, straight.

*Holotype*, ♂, Old Faithful Geyser, 7,300 ft., June 30 1941 (*C. P. Alexander*). *Allotopotype*, ♀. *Paratopotypes*, 2 ♂♂, 1 ♀, Emerald Pool, 7,275 ft., June 30, 1941; *paratypes*, 16 ♂♀, Jenny Lake, Grand Teton National Park, 6,800 ft., July 13, 1941 (*C. P. Alexander*); the latter series was taken in dry pine forest near the lake, remote from any stream or similar flowing body of water.

*Cryptolabis* (*Cryptolabis*) *molophiloides* is most closely related to *C. (C.) pachyphallus* Alexander, likewise from the north-central Rockies. This latter species differs especially in certain details of structure of the male hypopygium, especially of the dististyle, which is strongly bidentate or bilobed, and with the lobes of the basistyle differently constructed and armed. The specific name of the present fly is an allusion to the general resemblance to certain species of the genus *Molophilus*, particularly *M. (M.) colonus* Bergroth, with which the present fly was sometimes associated. It is very difficult to distinguish the sexes in this genus, the terminal structures being generally similar and with the details becoming visible only on slide mounts and under high magnification.