

MISCELLANEOUS PUBLICATIONS  
MUSEUM OF ZOOLOGY, UNIVERSITY OF MICHIGAN, NO. 90

**The Crane Flies of Alaska and the  
Canadian Northwest  
(Tipulidae, Diptera)  
The Genus *Erioptera* Meigen**

BY  
CHARLES P. ALEXANDER

ANN ARBOR  
MUSEUM OF ZOOLOGY, UNIVERSITY OF MICHIGAN  
April 22, 1955

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THE CRANE FLIES OF ALASKA AND THE CANADIAN NORTHWEST  
(TIPULIDAE, DIPTERA)  
THE GENUS ERIOPTERA MEIGEN

OUR knowledge of the crane flies of the far northwest of North America is still very unsatisfactory, despite rather extensive collections that have become available from various sources. Until the Alaska Highway was constructed in 1942 and opened to the general public about 1947, such collections had of necessity been restricted to localities accessible to coastal vessels and along the short lengths of railroad and highway available at that time. As a consequence vast areas in the interior of Alaska and the Yukon were quite inaccessible, and it is only within the past half dozen years that representative collections from the interior have come to hand.

INTRODUCTION

Various proposals have been made to delimit or subdivide the vast area under consideration. Hultén (1941),<sup>1</sup> in the initial fascicle of his "Flora of Alaska and Yukon," divides Alaska into various districts, based essentially on plant distribution and some correlated factors. His Arctic Coast District includes Point Barrow, the Brooks Range, and Colville River; Alaska Range District, Mc Kinley National Park; Central Pacific Coast District, the Chugach Mountains, with Anchorage, and the like. In a similar manner, Polunin (1951), likewise from a study of the flora, subdivides the entire Arctic into ten sectors that radiate from the pole, of which sector VI includes westernmost Alaska at about 169° W., eastward to the northeast extremity of the Yukon Territory at about 136° W.; sector VII includes the remainder of western Arctic Canada, from 136° W. to 95° W.

The recently published *Arctic Bibliography* (1953), issued under the direction of the Arctic Institute of North America, divides the Arctic and Subarctic of the world into 69 so-called sections, of which 16 fall within the limits of the present report and are adopted herein. These various areas are as follows:

- Sec. 5. Bering Strait.
- Sec. 6. Bering Sea (Pribilof Islands).
- Sec. 7. Aleutian Islands (Unalaska).
- Sec. 8. Aleutian waters.
- Sec. 9. Northern Alaska — most of the territory north of the Arctic Circle (Point Barrow, Brooks Range, Umiat).
- Sec. 10. Interior Alaska — central part of territory south of the Arctic

<sup>1</sup> See *References* at end of introductory account.

- Circle, including Seward Peninsula, to base of Alaska Peninsula (Katmai National Monument).
- Sec. 11. Gulf of Alaska; coastal, including the Kenai Peninsula and the coast south to 60° N. (Yakutat Bay).
- Sec. 12. Southeast Alaska — coastal, south of 60° N. (Haines, Skagway, Juneau, Sitka, Ketchikan; Alexander Archipelago).
- Sec. 13. Yukon Territory.
- Sec. 14. Beaufort Sea (north of sec. 9, 13, and 15).
- Sec. 15. District of Mackenzie River; Great Bear and Great Slave Lakes).
- Sec. 16. Canadian Northwest Territories (includes 15 and 17).
- Sec. 17. District of Keewatin.
- Sec. 18-19. Canadian Arctic islands, with surrounding waters.
- Sec. 28. Northern Manitoba (Churchill, York Factory).

*Crane-fly collections.* — Among the more important early materials in the group, chiefly from Alaska, were collections studied by Bergroth (1888) and Coquillett (1900). Bergroth's specimens were taken by Reinhold F. Sahlberg, in the vicinity of Sitka (sec. 12), possibly about 1870. Coquillett's report was based on more abundant materials collected by Trevor Kincaid, entomologist of the Harriman Expedition in 1899. Kincaid's itinerary (*Harriman Alaska Expedition*, 1904: 1-34) included coastal Alaska from the extreme southeast, northward along the Aleutian Peninsula, as far as the Shumagin Islands (sec. 8, 11, 12). Alexander studied important collections based on the Canadian Arctic Expedition (1919), Pribilof Island reports (1921, 1923), Katmai Expedition (1920), and other minor lots.

Later collections from southeastern Alaska (sec. 11, 12) were taken by Aldrich, Dyar, William Frohne and his son Richard, Berg, Malkin, and others. The most important materials from Point Barrow and the Brooks Range (sec. 9) were taken by Hurd, Jachowski, Weber, and others. From the great southern interior of Alaska (sec. 10) more satisfactory series have been secured by Chamberlin, Stone, Washburn, and several others. The important Alexander-Smith collections are discussed in greater detail later in this report.

Materials from the northern Yukon (sec. 13) and the Canadian Northwest Territories (sec. 16, Mackenzie and Keewatin, sec. 15 and 17) are from several sources. The most important of these include the collections made by Frits Johansen, naturalist of the Canadian Arctic Expedition, 1913-18 (Alexander, 1919; Wilkins, 1917) and later by Owen Bryant, who spent much of the summers from 1929 to 1932 at Fort Churchill (sec. 28) and in the Mackenzie River delta (sec. 15), with side trips to coastal Arctic Yukon and Herschel Island (sec. 13). Bryant's detailed itinerary and account of his trips have been given by Leussler (1935: 1-10). Bryant's valuable collections are in my possession and will be discussed in the various parts of this series of reports. From farther east in the districts of Mackenzie and Keewatin (sec. 15 - 17), scanty materials are available, taken by Francis Harper (1915, 1931, 1948), Johansen (*Reports, Canadian Arctic Expedition*, 1913-18), and others. Further important

specimens from this area are in the Canadian National Collections and the United States National Museum. The Churchill district (sec. 28) has been investigated by Bryant (Leussler, 1935), Denning, James, McClure (1943), Twinn, and several others.

*Alexander-Smith expedition.* — The largest collections available from the Yukon and interior of Alaska (sec. 10, 11, 13) resulted from a joint expedition from the University of Massachusetts in 1952, consisting of two parties which remained together for some six weeks and whose combined collections include probably more than 3000 specimens of these flies. One party included Mrs. Alexander and myself; the other, called hereinafter the Smith party, was under the leadership of Dr. Marion E. Smith, with Miss Elsie Maytrott and Mr. David L. Carson. The collections gathered by this expedition are so important that it seems advisable to record the itinerary, with dates. It may be noted that the Alaska Highway (formerly called the "Alcan") and all branch and approach roads in Alaska and the Yukon have numbered mileposts so that very accurate location and geographical data can be obtained. The Alaska Highway is herein recorded as AHMP (Alaska Highway Mile Post), with the appropriate mile. The important paper by Stone (1952), on the Simuliidae of Alaska, provides a map showing all the roads in Alaska, with their respective mileages. A further valuable reference, listing all roads and mileages, is the publication called *The Milepost* (cited under References).

The Alexander-Smith parties left Edmonton, Alberta, on June 21, reaching Dawson Creek, British Columbia, the starting point of the Alaska Highway (Mile 0) on June 23. Fairbanks, Alaska, 1527 miles distant, was reached on July 10. Various side trips and spur roads were traveled, including the Haines Cutoff to Haines, Alaska (158 miles); Steese Highway, Fairbanks to Circle, Alaska, July 10-13 (162 miles); Sterling Highway, Anchorage to Seward, Kenai Peninsula, July 21-28 (130 miles); Richardson Highway, to Valdez and Chitina, July 25-27; Glenn Highway, Anchorage to Tok Junction on the Alaska Highway, July 27-28. The Alexander party re-entered the Yukon on the return trip on July 29, reaching Dawson Creek on August 4. The Smith party delayed their return by about two weeks and were able to collect on the Kenai Peninsula (Anchorage to Homer, 230 miles) in late July.

Of very special interest and importance was the trip into McKinley National Park, where we stayed from July 14 to 21, spending the nights of July 14, 15, and 20 at the Teklanika River camp; July 16, 17, and 18 at Wonder Lake in the extreme west of the Park and in full view of Mount McKinley (Denali; Sheldon, 1930); and July 19 on the Toklat River, close to the Sheldon memorial plaque. Very excellent collecting was found, particularly along the Teklanika and Toklat rivers, and along Moose Creek, just outside the western park boundary.

The chief collecting spots along the Alaska Highway are the following:

Dawson Creek (Mile 0) to Yukon border (Mile 627).

Fort Nelson, B. C. — Mile 300.

Summit Lake, B. C. — Mile 392 (altitude 4250 feet, highest point on the highway).

Muncho Lake, B. C. — Mile 455.  
 Liard River, B. C. — Mile 496.  
 Yukon Territory (Mile 627) to Alaska Border (Mile 1221).  
 Watson Lake Camp, Yukon. — Mile 632.  
 Watershed between Mackenzie and Yukon rivers. — Mile 722.  
 Teslin Lake, Yukon. — Mile 804.  
 Whitehorse (capital of the Yukon). — Mile 919.  
 Haines Junction, Yukon. — Mile 1016.  
 Kluane Lake, Yukon. — Mile 1055.  
 Alaska Border (Mile 1221) to Fairbanks (Mile 1527).  
 Upper Tanana River bridge. — Mile 1307.5.  
 Tok Junction, Alaska. — Mile 1318.  
 Lower Tanana River bridge (Big Delta). — Mile 1438.  
 Highway in British Columbia 627 miles; Yukon, 594; Alaska, 306.

I wish to acknowledge with deepest thanks and appreciation the assistance of Mrs. Alexander, Dr. Smith, and Mr. Carson. Our united efforts have vastly increased the knowledge of crane-fly distribution in Alaska and the Yukon.

For convenience of reference I have tabulated the chief collectors, the dates when the materials were taken, the sections involved, and some reference to publications bearing on the collection in question.

| COLLECTOR               | YEARS                  | ARCTIC SECTION    | REFERENCE                                                       |
|-------------------------|------------------------|-------------------|-----------------------------------------------------------------|
| Aldrich, John M.        | 1921                   | 10, 11            | Alexander, 1924                                                 |
| Alexander, Charles P.   | 1952                   | 10, 11, 12, 13    | This report                                                     |
| Barrett-Hamilton, G. E. | 1897                   | 6                 | Coquillett (1899)                                               |
| Berg, Clifford O.       | 1951-1952              | 10, 11, 13        | Unpublished                                                     |
| Bryant, Owen            | 1929-1932              | 13, 15, 28        | Leussler, 1935                                                  |
| Carson, David L.        | 1952                   | 10, 11, 12, 13    | This report                                                     |
| Chamberlain, Joseph C.  | 1943-1945              | 10, 11            | Unpublished                                                     |
| Denning, Donald         |                        | 28                | Unpublished                                                     |
| Dyar, Harrison G.       | 1919                   | 12, 13            | Alexander, 1924                                                 |
| Frohne, Richard         | 1952                   | 10, 11, 12        | Unpublished                                                     |
| Frohne, William         | 1952 to date           | 10, 11, 12        | Unpublished                                                     |
| Hanna, G. Dallas        | 1914-1920              | 6                 | Alexander, 1921                                                 |
| Harper, Francis         | 1914, 1920,<br>1947    | 15, 17            | Harper, 1915, 1931,<br>1948                                     |
| Hine, James S.          | 1917, 1919             | 10                | Alexander, 1920                                                 |
| Hurd, Paul D.           | 1952                   | 9                 | Unpublished                                                     |
| Jachowski, L. A.        | 1947                   | 9                 | Unpublished                                                     |
| Johansen, Frits         | 1913-1918              | 9, 10, 12, 13, 15 | Alexander, 1919                                                 |
| Kennicott, Robert       | 1859-1862<br>1865-1866 | 10, 13, 15        | Loew, 1863-1865;<br>Osten Sacken, 1859-<br>1869; Alexander 1915 |
| Kincaid, Trevor         | 1899                   | 8, 11, 12         | Coquillett, 1900                                                |
| Malkin, Borys           | 1951                   | 12                | Unpublished                                                     |
| McClure, H. E.          | 1936                   | 28                | Alexander, 1938;<br>McClure, 1943                               |
| Miller, Edward K.       | 1949                   | 12, 13            | Unpublished                                                     |
| Sahlberg, Reinhold F.   | ?                      | 12                | Bergroth, 1888                                                  |
| Sailer, Reece I.        | 1948                   | 10, 11            | Unpublished                                                     |
| Smith, Marion E.        | 1952                   | 10, 11, 12, 13    | This report                                                     |

|                          |           |            |                  |
|--------------------------|-----------|------------|------------------|
| Sommerman, Kathryn       | 1948      | 10, 11, 13 | Unpublished      |
| Stone, Alan              | 1947      | 10, 11, 13 | Stone, 1952      |
| Twitchell, A. H.         | 1919      | 10         | Alexander, 1924  |
| Washburn, Richard H.     | 1950      | 10, 11     | Unpublished      |
| Weber, Neal A.           | 1948-1950 | 9          | Weber, 1948-1950 |
| Whitney, A. G. and E. G. | 1913-1914 | 6          | Alexander, 1923  |

## REFERENCES

## ANON.

- 1953 Arctic Bibliography. Washington: Arctic Institute of North America, Department of Defense, 1: 1-1498 (refs. 1-10007); 2: 1499-2967 (refs. 10008-20003); 3: 2968-4478 (index).
- 1941 Bibliography of National Parks and Monuments West of the Mississippi River, 2: Katmai National Monument, pp. 1-6; Mount McKinley National Park, pp. 1-7.
- 1899 Harriman Alaska Expedition (see Coquillett, 1900).
- 1952 The Milepost, Guide to the Land of the Northern Lights. Anchorage: Alaska Hiway Research Co. Pp. 1-132, map, figs.

## ALEXANDER, CHARLES P.

- 1919 The Crane-flies Collected by the Canadian Arctic Expedition, 1913-1918. Rept. Can. Arctic Exped., 1913-18, III: Insects, C: 1c-30c, 6 pls.
- 1920 Scientific Results of the Katmai Expedition of the National Geographic Society. The Crane-flies (Tipulidae, Diptera). Ohio Journ. Sci., 20: 193-203.
- 1921 Dipterous Insects of the Family Tipulidae from the Pribilof Islands, Alaska. Proc. Calif. Acad. Sci., (4) 11: 183-84.
- 1923 Diptera of the Pribilof Islands, Alaska (Tipulidae and Rhyphidae). N. Amer. Fauna, 46: 159-69, 2 pls.
- 1924 New Species of Two-winged Flies from Western North America Belonging to the Family Tipulidae. Proc. U. S. Nat. Mus., 64, art. 10: 1-16.
- 1934 Diptera Collected on Southampton Island by George Miksch Sutton. Trichoceridae and Tipulidae. Mem. Carnegie Mus., 12, Pt. 2, sec. 4: 1-10, 1 pl. (List and bibliography of Arctic North American Tipulidae.)
- 1938 New or Insufficiently-known Crane-flies from the Nearctic Region (Tipulidae, Diptera). Pt. IV. Bull. Brooklyn Ent. Soc., 33: 71-78.

## BERGROTH, EWALD

- 1888 Ueber einige nordamerikanische Tipuliden. Wien. Ent. Zeitung, 7: 193-201, 239, 240.

## COQUILLET, D. W.

- 1900 Papers from the Harriman Alaska Expedition. IX. Entomological Results (3): Diptera. Proc. Wash. Acad. Sci., 2: 389-464. (Reprinted as Harriman Alaska Expedition: Alaska. VIII. Insects, Pt. II: 3-78, 1904; New York: Doubleday, Page. Further reprinted as Harriman Alaska Series. IX. Insects, Pt. II: 3-78, 1910; Smithsonian Inst., Washington.)

## DIETZ, WILLIAM G.

- 1915 Two New Tipulidae from Northern Alberta. Can. Ent., 47: 329-32, 2 figs. (Based on materials taken by Francis Harper in 1914; Rocher River now called the Taltson River; Tsolinoi Lake misspelling for Tsalwor Lake, in northwestern Saskatchewan.)

## HARPER, FRANCIS

- 1915 The Athabasca-Great Slave Lake Expedition, 1914. Can. Geol. Surv., Summary, 1914; pp. 159-63. (Taltson River, 61° 22' N., 112° 45' W.)
- 1931 Physiographic and Faunal Areas in the Athabaskan and Great Slave Lakes Region. Ecology, 12: 18-32, map, illus.
- 1948 Fishes of the Nueltin Lake Expedition, Keewatin, 1947. Pt. 2 — Historical and Field Notes. Proc. Acad. Nat. Sci. Phila., 100: 153-84, 2 pls.

## HULTÉN, ERIC

- 1941-49 Flora of Alaska and Yukon, I-IX. (Fasc. I includes the division of area into floral districts.)

## LEUSSLER, R. A.

- 1935 Notes on the Diurnal Lepidoptera of the Canadian Arctic Collected by Owen Bryant in the Summers of 1929 to 1932. Bull. Brooklyn Ent. Soc., 30: 1-10 (itinerary and general account), 42-62.

## McCLURE, H. ELLIOTT

- 1943 Aspection in the Biotic Communities of the Churchill Area, Manitoba. Ecol. Mon., 13: 1-35, map, illus.

## OSGOOD, WILFRED H.

- 1904 A Biological Reconnaissance of the Base of the Alaska Peninsula. N. Amer. Fauna, 24: 1-86, 2 maps, 5 pls., (life zones, 21-25).

## OSGOOD, WILFRED H., and L. B. BISHOP

- 1900 Results of a Biological Reconnaissance of the Yukon River Region. N. Amer. Fauna, 19: 1-100, map, 6 pls.

## POLUNIN, NICHOLAS

- 1951 The Real Arctic: Suggestions for Its Delimitation, Subdivision and Characterization. Journ. Ecol., 39: 308-15, 1 map.

## PREBLE, EDWARD A.

- 1902 A Biological Investigation of the Hudson Bay Region. N. Amer. Fauna, 22: 1-140, 1 map, 13 pls., (life zones, 22-23).
- 1908 A Biological Investigation of the Athabaska-Mackenzie Region. *Ibid.*, 27: 1-574, 2 maps, 25 pls., 16 figs., (life zones, 49-53).

## PREBLE, EDWARD A., and W. L. MACATEE

- 1923 A Biological Survey of the Pribilof Islands. N. Amer. Fauna, 46: 1-255, 3 maps, 15 pls., (life zones, 5-9).

## SHELDON, CHARLES

- 1930 The Wilderness of Denali. New York: Scribners Sons. Pp. 1-412, map, figs.

## SHELFORD, VICTOR E., and collaborators

- 1926 Naturalists Guide to the Americas. Baltimore: Williams and Wilkins. Pp. 1-761, 16 figs., maps. (Mackenzie Watershed, Northern Hudson Bay Region, Upper Yukon Region, and the Arctic Islands, by E. A. Preble; Alaska, by W. H. Osgood; National Forests of the Alaskan District, by John D. Guthrie.)

## STONE, ALAN

- 1952 The Simuliidae of Alaska (Diptera). Proc. Ent. Soc. Wash., 54: 69-96, map, 4 figs.

## WEBER, NEAL A.

- 1948 Opportunities for Entomological Research in the Arctic. Ent. News, 59: 253-57.  
1949 Late Summer Invertebrates, Mostly Insect, of the Alaskan Arctic Slope. *Ibid.*, 65: 118-28.  
1950 A Survey of the Insects and Related Arthropods of Arctic Alaska, Pt. I. Trans. Amer. Ent. Soc., 76: 147-206, 7 pls.

## WILKINS, GEORGE H., and others.

- 1917 [Itinerary.] Canadian Arctic Expedition.  
Ottawa: Acland. Pp. 1-56, 3 maps.

## SYSTEMATIC ACCOUNT

The Genus *Erioptera* Meigen

The first of this series of papers is devoted to the genus *Erioptera*, small crane flies that are unusually well represented in the region under consideration. It seems probable that this group will prove to be the largest single genus within the area and that additions to the list may be expected as further collections become available.

Species of *Erioptera* occur virtually throughout the world and a considerable number of so-called subgenera have been proposed to receive various groups of species. In the local fauna I am recognizing eight such groups, but certain of these seem to be so well defined that it is probable they will eventually be regarded as valid genera. The divisions that I consider to be particularly well delimited include *Empeda*, *Gonomyodes*, *Hesperoconopa*, and *Arctoconopa*. *Erioptera* likewise is well marked and includes, besides the typical subgenus, the less strongly marked groups *Psiloconopa*, *Symplecta*, and *Hoplolabis*.

While the general structure and venation of the above subgenera appear to indicate relationship, the basic plan of structure of the male hypopygium is so different in these various taxa that it seems certain that they eventually will be raised in rank. Edwards (1938) indicated the division of the genus in the British fauna, based on the inversion (*Ilisia* Rondani) and noninversion (remaining British subgenera) of the male hypopygium. Until now no proper attention has been devoted to the phallosome and especially to the aedeagus. In certain of the local groups, as *Empeda*, *Gonomyodes*, *Hesperoconopa*, and *Arctoconopa*, this organ is simple and unmodified, whereas in *Erioptera* and those subgenera that appear to be most closely associated with it, including *Psiloconopa*, *Symplecta*, and *Hoplolabis* (with the extralimital *Ilisia*, *Trimicra*, and *Empedomorpha*), it is bifid, in some instances very deeply so. A comparable condition is found in the related genus *Ormosia* Rondani, in which the two so-called subgenera *Ormosia* and *Scleroprocta* Edwards have the aedeagus simple, with a single terminal opening, whereas the numerous species of *Rhypholophus* Kolenati have it conspicuously bifid, somewhat as in typical *Erioptera*. Thus, one finds apparently parallel developments in this organ in these two important genera. It seems virtually certain that such

differences are significant and provide characters of generic importance, but it is difficult to find associated characters that hold in either sex. From this it would appear that the arrangement of the species as to genera and subgenera still remains in question.

While most of the species treated herewith are widespread and common, certain of the novelties that were discovered by us in 1952 were found to be exceedingly local and restricted in their distribution. This fact may be illustrated by three new species that are described hereinafter.

*Erioptera (Empeda) toklat*

Found along a small temporary snow-fed stream flowing into the Toklat River not far from the Sheldon plaque. A small series was swept from a group of willows on the bank, but none could be found elsewhere. Less than half a mile away great herds of caribou were migrating down the river valley on this date (July 16, 1952), while in the vicinity individuals of the great Toklat grizzly bear (*Ursus toklat* Merriam) were roaming about over the flood plain. On July 20, when returning, I wished to secure further specimens, but upon going to the place found that the small stream had disappeared and the supporting snow masses had melted. Not a single additional specimen could be located here, although one female was taken later the same day along one of the small tundra streams near the East Fork of the Toklat.

*Erioptera (Psiloconopa) carsoni*

Along the Chatanika River, Steese Highway MP 39, on the evening of July 10, 1952, and the following morning, a small series of this distinct fly was taken by Mr. Carson, swept from a patch of *Equisetum hiemale* along a small side rill of the main stream. Intensive collecting in the vicinity failed to produce further specimens.

*Erioptera (Psiloconopa) mabelana*

Taken in the evening of July 7, 1952, along Lake Creek, Yukon (AHMP 1152), by sweeping alder, willow, fireweed, and horsetail along the banks of the stream. A light rain was falling, and collecting was possible for only one-half hour. The unique male type was discovered early and was recognized as being new and desirable, but despite every effort no further specimens could be found nor was the species taken elsewhere. The fly was associated with various other species of the genus, including *Erioptera (Arctoconopa) aldrichi*, *E. (A.) forcipata*, *E. (A.) katmai*, *E. (Hesperoconopa) aperta*, and *E. (Symplecta) sunwapta*.

*Erioptera (Empeda) rectispina*, new species

(Figs. 1, 2, 7)

Head and thorax dark brown, pruinose; wings with a weak brown tinge, stigma faintly differentiated; cell *1st M*<sub>2</sub> open or closed, in the latter case the cell small; male hypopygium with both dististyles slender and delicate, unusually straight and parallel-sided, the inner style unequally bifid.

Male. — Length about 4–4.2 mm.; wing 3.8–4.2 mm.

General coloration of head and thorax dark brown, gray pruinose, the thoracic pleura paler, variegated with darker on the anepisternum and ventral sternopleurite. Antennae and legs brown, halteres paler. Abdomen with the tergites dark brown, the sternites paler; hypopygium brownish yellow.

Wings (Figs. 1, 2) with a weak brownish tinge, the stigma only slightly darker; veins light brown, even paler in the prearcular and costal fields. Venation: In the holotype, *Sc*<sub>1</sub> ends just beyond midlength of *Rs*, *Sc*<sub>2</sub> apparently lacking; *R*<sub>2+3+4</sub> and *R*<sub>2</sub> subequal, the latter slightly oblique; vein *R*<sub>3</sub> oblique, nearly straight, diverging from *R*<sub>4</sub> at an angle, cell *R*<sub>2</sub> at margin a trifle less than cell *R*<sub>3</sub>; cell *1st M*<sub>2</sub> present in both wings but very small (Fig. 2), with cell *2nd M*<sub>2</sub> petiolate; *m-cu* beyond fork of *M*; vein *2nd A* gently sinuous at near midlength. In other specimens cell *1st M*<sub>2</sub> is closed but larger (Fig. 1) or, in rare cases, open by the atrophy of *m*.

Male hypopygium (Fig. 7) with the apical lobe of basistyle, *b*, small, setiferous. Both dististyles, *d*, slender and very delicate, unusually straight and parallel-sided; outer style a simple rod, inner style unequally bifid, the longer arm exceeding the outer style in length and even more slender; short arm small, narrowed outwardly, its tip very slender to subacute.

Holotype, ♂, on microscope slide; U.M.M.Z., Rogers study specimen 4417, Alaska, tidal flats, 5 miles west of Valdez, July 11, 1949 (E. K. Miller). Paratopotype, ♂, on slide. Paratypes, ♂, British Columbia, AHMP 128, June 25, 1952 (Alexander), swept from willow, dwarf birch, and shrubby cinquefoil; ♂, Yukon, Watson Lake Public Camp, AHMP 632, along small creek, June 30, 1952 (Alexander).

Readily distinguished from the similar regional members of the subgenus by the normally closed cell *1st M*<sub>2</sub> and the structure of the male hypopygium. It is most like *Erioptera (Empeda) subborealis*, new species, differing in these characters.

*Erioptera (Empeda) subborealis*, new species

(Figs. 3, 8)

Size relatively large (wing, male, about 5 mm.); general color of thorax almost uniform gray; halteres yellow; legs brownish yellow to very pale brown; wings with veins *R*<sub>3</sub> and *R*<sub>4</sub> extending parallel to one another for most of their lengths; male hypopygium with the outer dististyle

blackened, bifid, terminating in two principal teeth, with smaller roughenings on inner margin back from apex.

Male. — Length about 4.5 mm.; wing 5 mm.

Female. — Length about 5.5 mm.; wing 6 mm.

Rostrum brown; palpi brownish black. Antennae black; basal flagellar segments short-oval, the succeeding ones more elongate, with exceedingly long verticils; outer segments elongate, with shorter verticils. Head gray.

Thorax almost uniformly gray, the praescutum with very vague indications of darker intermediate stripes; pronotal scutellum and the narrow pretergites light yellow; extreme posterior border of mesonotal scutellum obscure yellow. Halteres yellow. Legs with the coxae and trochanters yellow; remainder of legs brownish yellow to very pale brown, the outer tarsal segments darker. Wings (Fig. 3) with a faint grayish tinge, the stigma barely indicated; prearcular and costal fields a trifle more yellowed; veins light brown, paler in the more brightened fields. Venation:  $Sc$  long,  $Sc_1$  ending about opposite two-thirds the length of  $Rs$ ,  $Sc_2$  not far from its tip;  $R_2$  oblique, subequal to or slightly longer than  $R_{2+3+4}$ , veins  $R_3$  and  $R_4$  extending parallel to one another for most of their lengths, cell  $R_2$  at margin from two-thirds to three-fourths cell  $R_3$ ; cell 1st  $M_2$  open by the atrophy of  $m$ ;  $m-cu$  a short distance before the fork of  $M$ , in some instances up to one-third its own length.

Abdominal tergites brownish gray, basal sternites more yellowed; hypopygium brownish yellow. Male hypopygium (Fig. 8) much as in *stigmatica*, including the low setuliferous apical lobe of the basistyle,  $b$ , and the phallosome. Outer dististyle,  $d$ , with the armature of the outer branch distinct, including two principal teeth, with evidently variable smaller denticles and roughenings more basally on margin.

Holotype, ♂, Anchor River, Kenai Peninsula, Alaska, July 25, 1952 (David L. Carson). Allotype, ♀, Mount Edith Cavell, Jasper National Park, Alberta, altitude 6000 feet, July 25, 1949 (Alexander).

Most closely related to *Erioptera (Empeda) stigmatica* (Osten Sacken), differing in the larger size, coloration, and details of the male hypopygium.

*Erioptera (Empeda) toklat*, new species

(Figs. 4, 9)

General coloration dark brownish gray, the thoracic notum scarcely brightened, with the exception of the pretergites; knob of halteres whitish yellow; legs black; wings subhyaline, stigma represented by a narrow darkened seam over vein  $R_{1+2}$ ;  $Sc$  relatively long,  $Sc_1$  ending from about one-third to one-half the length of  $Rs$ ; cell 1st  $M_2$  normally closed; male hypopygium with mesal face of basistyle heavily blackened; outer dististyle bifid, the blades stout.

Male. — Length about 3.2-3.5 mm.; wing 3.8-4.5 mm.

Female. — Length about 3.5-4 mm.; wing 4.2-5 mm.

Rostrum and palpi black. Antennae black, short; basal flagellar segments subglobular, the outer ones slightly more elongate, with very long verticils. Head gray.

Thoracic notum dark brownish gray, scarcely brightened except for the pretergites; praescutal stripes not or scarcely indicated. Pleura clearer gray; no pteropleural setae. Halteres with stem reddish, knob whitish yellow, conspicuous. Legs black, the coxae more pruinose. Wings (Fig. 4) subhyaline, the stigma vaguely darker, best indicated as a seam along vein  $R_{1+2}$ ; veins brown, paler in the prearcular and costal fields. Venation:  $Sc$  relatively long,  $Sc_1$  ending from about one-third to beyond midlength of  $Rs$ ,  $Sc_2$  not far from its tip;  $R_{2+3+4}$  subequal in length to  $R_2$ ;  $R_{3+4}$  long, exceeding vein  $R_3$  alone, the latter oblique; outer medial field unusually variable, normally with cell  $1st\ M_2$  closed, shorter than the veins beyond it; in other specimens, the cell open by the atrophy of  $m$ ;  $m-cu$  close to fork of  $M$ ; anal veins divergent.

Abdomen dull black, including the hypopygium, the styli more yellowed. Male hypopygium (Fig. 9) with the mesal face of basistyle,  $b$ , heavily blackened producing a line or thickening. Outer dististyle,  $d$ , bifid, the blades stout, the outer one curved; proportions of length of stem and blades evidently variable.

Holotype, ♂, Toklat River, McKinley National Park, Alaska, July 16, 1952 (Alexander). Allotopotype, ♀, with the type. Paratopotypes, several ♂♀, with the types; paratype, 1 ♀, East Fork of Toklat River, July 20, 1952 (Alexander).

Superficially, much like *Erioptera (Empeda) tristimonia* Alexander, but differing in details of coloration and, especially, in the structure of the male hypopygium. An account of the occurrence of this fly is given earlier in this report.

*Erioptera (Empeda) tristimonia* Alexander

*Erioptera (Empeda) tristimonia* Alexander, *Amer. Midl. Nat.*, 30 (1943): 752-53, Fig. 27 (♂ hypopygium).

Alaska: Chief Creek, AHMP 1364, July 9, 1952 (Alexander).

Yukon: Unahint (Klukshu) Creek, Haines Highway MP 118, July 5, 1952 (Alexander); Marshall Creek, AHMP 1006, July 4, 1952, swept from willow, alder, fireweed, and other vegetation (Alexander).

*Erioptera (Empeda) umiat*, new species

(Figs. 5, 10)

Wings with vein  $Sc$  short,  $Sc_1$  ending about opposite one-fifth the length of  $Rs$ ,  $Sc_2$  opposite the origin of the latter; cell  $1st\ M_2$  closed, elongate; male hypopygium with the outer dististyle a flattened blade, the outer margin only a trifle produced; inner dististyle trifid, the longest arm multispinose; phallosome consisting of a depressed central plate that is

produced caudad into two flattened obtuse blades separated by a slightly wider rounded notch.

Male. — Wing 3.4 mm.

Wing (Fig. 5) very faintly tinged, the prearcular and costal fields more whitened, stigma scarcely indicated; veins light brown, still paler in the whitened fields. Venation:  $Sc$  very short,  $Sc_1$  ending about opposite one-fifth the length of  $R_s$ ,  $Sc_2$  exactly opposite this origin;  $R_2$  slightly oblique, subequal to  $R_{2+3+4}$ ; veins  $R_3$  and  $R_4$  divergent,  $R_3$  subsinuous, cell  $R_2$  at margin about two-thirds  $R_3$ ; cell  $1st\ M_2$  present, elongate, gently widened outwardly,  $m$  straight, about one-third the arcuated basal section of  $M_3$ ;  $m-cu$  about one-fourth its length before the fork of  $M$ ; anal veins divergent.

Abdomen, including hypopygium and its appendages, dark brown. Male hypopygium (Fig. 10) with the outer dististyle,  $d$ , a flattened blade, the outer margin at near midlength a very little produced; inner dististyle trifid, including a longer curved multispinose outer arm that bears a longer blade nearer its base; inner arm a longer spine or blade that is slightly more basal in position. Phallosome,  $p$ , consisting of a depressed central plate that is produced caudad into two flattened obtuse blades, separated by a slightly wider rounded notch.

Holotype, ♂, on microscope slide; U.M.M.Z., Rogers study specimen 4958; Umiat, Upper Colville River, north slope of Brooks Range, Alaska, June 25, 1947 (Jachowski).

Most similar to *Erioptera (Empeda) tristimonia* Alexander, differing in details of venation and structure of the male hypopygium.

*Erioptera (Gonomyodes) tacoma* Alexander

*Erioptera (Gonomyodes) tacoma* Alexander, *Amer. Midl. Nat.*, 42 (1949): 321-23, Fig. 55 (♂ hypopygium).

Alaska: McKinley National Park, Teklanika River, July 20, 1952 (Alexander and Carson).

*Erioptera (Gonomyodes) yohoensis* Alexander

(Figs. 6, 11)

*Erioptera (Gonomyodes) yohoensis* Alexander, *Ent. News*, 63 (1952): 234-36.

British Columbia: AHMP 392, upper branches of North Fork of Tetsa River, near Summit Lake, altitude 4250 feet, June 26, 1952 (Alexander). The wing and male hypopygium are shown.

*Erioptera (Hesperoconopa) aperta* (Coquillett)

*Gnophomyia aperta* Coquillett, *Journ.N.Y.Ent.Soc.*, 13 (1905): 58.

The type, from Kaslo, British Columbia, was taken July 11-18, 1903, by Dyar. Widespread in Alberta and southward in the mountains.

Alaska: Haines Highway, MP 37, July 6, 1952 (Alexander); Valdez, July 10, 1949; AHMP 1225, June 26, 1949 (Miller).

Yukon: AHMP 674, Big Creek, July 1, 1952 (Alexander); AHMP 872, Judas Creek, July 3, 1952 (Alexander); AHMP 1006, Marshall Creek, July 4, 1952 (Carson and Smith); AHMP 1152, Lake Creek, July 7, 1952 (Alexander).

*Erioptera (Hesperoconopa) dolichophallus* Alexander

*Erioptera (Hesperoconopa) dolichophallus* Alexander, *Amer. Midl. Nat.*, 39 (1948): 77-78, Fig. 60 (♂ hypopygium).

British Columbia: John Hart Highway, Pine Pass, altitude 2800 feet, near Beaver Creek, August 5, 1952 (Alexander).

*Erioptera* Meigen (*Arctoconopa*, new subgenus)

Antennae 16-segmented; flagellar segments oval, with short verticils. Legs without flattened scales. Wings with  $Sc_1$  moderately long, about one-half  $Rs$ ; cell  $M_2$  open by atrophy of  $m$ ; vein  $2nd\ A$  straight, the anal veins divergent. Wings commonly unpatterned, in some species (*melampodia* group) clouded or crossbanded with darker. Male hypopygium not inverted. Tergite large, longer than broad, the posterior border conspicuously emarginate. Dististyles two, terminal or subterminal in position. Gonapophyses simple, subtending the long slender aedeagus, which is simple or, in some instances, slightly enlarged at apex and with small recurved spines.

Type of subgenus. — *Erioptera (Arctoconopa) forcipata* Lundström (Arctic and Subarctic).

Other included species are *E. (A.) aldrichi* Alexander, *E. (A.) carbonipes* Alexander, *E. (A.) cinctipennis* Alexander, *E. (A.) katmai* Alexander, *E. (A.) kluane*, new species, *E. (A.) manitobensis* Alexander, *E. (A.) pahasapa* Alexander, and *E. (A.) painteri* Alexander (Nearctic); *E. (A.) melampodia* Loew (western Palaearctic); *E. (A.) bifurcata* Alexander, *E. (A.) megaura* Alexander (eastern Palaearctic).

*Erioptera (Arctoconopa) aldrichi* Alexander

(Fig. 16)

*Erioptera aldrichi* Alexander, *Proc. U.S.Nat.Mus.*, 64, art. 10 (1924): 4-5.

Alaska: Umiat, Brooks Range, Upper Colville River, 1950 (Neal A. Weber, Coll. No. 2598); McKinley National Park, Teklanika River, July 15, 1952 (Alexander and Carson); Valdez, June 8, 1921 (Aldrich), type; AHMP 1438, Big Delta Bridge, Tanana River, July 9, 1952 (Alexander); Haines Highway, MP 10, Tagu Arm, July 6, 1952 (Alexander).

Yukon: AHMP 1152, Lake Creek, July 7, 1952 (Alexander).

British Columbia: AHMP 98, July 23, 1952 (Alexander); Columbia River, at junction with Downie Creek, Big Bend Highway, swept from river bank vegetation, August 18, 1947 (Alexander).

Male hypopygium (Fig. 16) with the ninth tergite, *9t*, long, its posterior border conspicuously emarginate, thickened, provided with long conspicuous setae; on lower surface of apex with pale membrane covered with delicate setulae distributed in small separated areas; dorsal surface of tergite back from the emargination with a central thickening that divides behind into two more slender arms. Basistyle, *b*, with a conspicuous apical lobe, the dististyles slightly subterminal in position. Outer dististyle, *d*, a simple gently curved rod from an enlarged base, narrowed to the subacute tip; posterior border with microscopic denticles. Inner dististyle conspicuously bifid, the long outer arm a strong spine that narrows to the acute tip; lower arm shorter and more slender, with pale membrane on the lower margin and more basally. Aedeagus, *a*, a simple slightly curved rod, the subtending apophyses appearing as flattened dusky plates.

*Erioptera (Arctoconopa) forcipata* (Lundström)

(Fig. 17)

*Psiloconopa forcipata* Lundström, "Diptera Nematocera Arct. Geg. Sibiriens," *Mem. Acad. Imper. Sci. Petrograd*, (8) Phys. Math., ser. 29, No. 8 (1915): 27-28, Pl. 2, Fig. 39 (♂ hypopygium).

*Erioptera (Erioptera) angustipennis* Alexander, *Canad. Arct. Exped.*, 1913-18, III C (1919): 5 c.

*Erioptera alaskensis* Alexander, *Proc. U.S. Nat. Mus.*, 64, art. 10 (1924): 5-6.

Lundström described *forcipata* from a unique male specimen, taken at a station called Sytychantala in the Chara-Ullach Mountains, Siberia, near the mouth of the Lena River, by M. I. Brussnew in June-July, 1902. The paper wherein the species was described is one of the scarcest of all publications on the Tipulidae, a copy being in my possession through the kindly interest of the late Dr. Ernst Ewald Bergroth and received from him in 1922. The type of *angustipennis* was from Bernard Harbor, Dolphin and Union Straits, Mackenzie District, Arctic Canada, taken August 1-7, 1915, by Frits Johansen. The types of *alaskensis* were from Valdez, Alaska, June 8, 1921, and at Camp 372 of the Alaska Engineering Commission, now called Windy, on the Alaska Railroad, taken July 12, 1921, by Aldrich.

From Lundström's figure of *forcipata*, it is apparent that our Arctic American materials are conspecific, and I regard the synonymy as given above as correct. I am indebted to G. E. Shewell for re-examining the type of *angustipennis* and preparing an excellent drawing of the male hypopygium. It further appears that *Erioptera (Arctoconopa) gaspicola* Alexander (*Journ. N.Y. Ent. Soc.*, 37 (1929): 51-52), widespread in southern Canada and the western United States, is best recognized as being a weak southern cline of *forcipata*, distinguished by the pointed inner dististyles of the male hypopygium.

Alaska: AHMP 1462, Banner Creek, July 10, 1952 (Alexander); AHMP

1438, Big Delta Bridge, Tanana River, July 9, 1952 (Alexander); AHMP 1307, Upper Bridge, Tanana River, July 8, 1952 (Alexander); Chatanika River, Steese Highway MP 39, July 10, 1952 (Alexander, Carson, and Smith); Haines Highway, MP 10, Tagu Arm, July 6, 1952 (Alexander).

Yukon: AHMP 872, Judas Creek, July 3, 1952 (Alexander); AHMP 987, Cracker Creek, July 4, 1952 (Alexander); AHMP 1152, Lake Creek, July 7, 1952 (Alexander).

British Columbia: AHMP 455, Muncho Lake, June 26-27, 1952 (Alexander and Carson); swept from *Equisetum* and cotton grass, associated with *Erioptera (Arctoconopa) katmai* Alexander.

Male hypopygium (Fig. 17) with the ninth tergite, *9t*, large, deeply emarginate posteriorly, the obtuse lobes provided with conspicuous setae. Basistyle, *b*, only slightly produced at apex, the dististyles terminal. Outer dististyle, *d*, broadly expanded outwardly, the outer angles prolonged into slender lobes, the surface of much of the blade microscopically scabrous. Inner dististyle much smaller, appearing as a straight rod, narrowed outwardly, the obtuse apex blackened. Gonapophyses, *g*, appearing as simple divergent blades that subtend the slender simple aedeagus, the latter a little dilated at tip and with two narrow recurved blades or spines.

*Erioptera (Arctoconopa) katmai* Alexander

(Fig. 18)

*Erioptera katmai* Alexander, *Ohio Journ.Sci.*, 20 (1920): 195-96.

Alaska: Umiat, Brooks Range, Upper Colville River, June 25, 1947 (Jachowski), UMMZ, Rogers study specimen 4957; Fairbanks, July 4, 1921 (Aldrich); AHMP 1240, July 8, 1952, in dry muskeg, among dwarf birch, Labrador tea, shrubby cinquefoil, and other plants (Alexander); Kenai Peninsula, Anchor River, July 25, 1952 (Carson and Smith); Savonoski, Naknek Lake, June, 1919 (J. S. Hine), type.

Yukon: AHMP 1152, Lake Creek, July 7, 1952 (Alexander); head of Kluane Lake, AHMP 1055, July 7, 1952 (Alexander); AHMP 987, Cracker Creek, July 4, 1952, on *Equisetum arvense* and fireweed (Alexander); Takhini River, AHMP 946, July 4, 1952 (Alexander).

British Columbia: AHMP 455, Muncho Lake, June 26-27, 1952 (Alexander and Carson).

Male hypopygium (Fig. 18) with the tergite, *9t*, long, very deeply and narrowly emarginate, the apices and inner edges of the lobes with pale membrane; lobes with numerous setae, lacking or virtually so on the surface behind the discal arms. Basistyle, *b*, produced at apex into two lobes, the inner one more slender. Dististyles, *d*, heavily blackened, the outer style stout, apex obtuse, and outer margin near base with very inconspicuous appressed spinulae; inner dististyle variable in shape, with a long slender outer spine, the main axis produced into shorter spines; inner margin near base with a few coarse setae. Phallosome, *p*, bearing a resemblance to the pretarsus of a fly, the slender outer claws blackened, incurved to the acute tips, the "pulvillar pad" broadly transverse,

brownish yellow, the lobes with conspicuous yellow setae; "empodium," which is the aedeagus, relatively short, straight, at apex with a transverse cap or bar.

*Erioptera (Arctoconopa) kluane*, new species

(Figs. 12, 19)

Size relatively large (wing, male, 5.5 mm. or more); general coloration gray, the praescutum with four brown stripes; antennae black throughout; legs black; wings subhyaline, unpatterned except for the narrow brown stigma;  $Sc_1$  ending about opposite  $R_2$ ;  $R_{2+3+4}$  variable in length; cell  $M_2$  open by atrophy of  $m$ ; male hypopygium with the outer dististyle a slender blackened rod, the outer margin of basal half microscopically scabrous; inner dististyle very small, unequally bilobed.

Male. — Length about 5-6 mm.; wing 5.5-6.5 mm.

Female. — Length about 6-6.5 mm.; wing 6-6.5 mm.

Rostrum gray; palpi brownish black. Antennae black throughout, the scape pruinose; flagellar segments oval, more slender outwardly, the terminal one longer than the penultimate; verticils short. Head gray; anterior vertex broad.

Pronotum gray. Mesonotal praescutum gray, with four brown stripes, the intermediate pair separated by a ground line that narrows posteriorly, the lateral stripes less distinct; tuberculate pits very small but evident, lying shortly before level of the large black pseudosutural foveae; posterior sclerites of notum gray, the scutal lobes indistinctly patterned with brown. Pleura and pleurotergite clear gray; sternopleurite and pteropleurite with sparse yellow setae. Halteres infuscated. Legs with coxae and trochanters gray; remainder of legs black. Wings (Fig. 12) subhyaline, the narrow stigma brown; veins brownish black,  $Sc$  paler. Venation:  $Sc_1$  ending opposite or just beyond  $R_2$ ;  $R_{2+3+4}$  variable in length, in cases being subequal to or shorter than  $R_{2+3}$ , in others (as shown) more than twice as long;  $R_{2+3}$  longitudinal in position; cell  $M_2$  open by the atrophy of  $m$ ;  $m-cu$  at or close to fork of  $M$ ; anal veins divergent, 2nd  $A$  virtually straight.

Abdomen, including hypopygium, black, heavily gray pruinose. Male hypopygium (Fig. 19) with the tergite,  $9t$ , elongate, the posterior border deeply notched, bordered by pale membrane. Basistyle,  $b$ , with the outer ventral angle produced into a slender lobe. Two dististyles,  $d$ , the outer a slender black rod from a dilated base, narrowed to the subacute tip, the basal half of outer margin microscopically scabrous; inner style very small, unequally bilobed, the outer lobe shorter and paler, the inner one microscopically roughened and setuliferous. Phallosome generally as in *katmai*, suggesting the pretarsus of a fly, the gonapophyses appearing as outer blackened horns, with inner pale setiferous blades; aedeagus slender, abruptly capitate at apex.

Holotype, ♂, south end of Kluane Lake, Yukon, AHMP 1055, July 30, 1952 (Alexander). Allotopotype, ♀, July 7, 1952. Paratopotypes, ♂ ♀, July 7 and 30, 1952 (Alexander).

The closest ally of the present fly is *Erioptera (Arctoconopa) katmai* Alexander, which differs most evidently in the structure of the male hypopygium, particularly the dististyles.

*Erioptera (Psiloconopa) carsoni*, new species

(Figs. 13, 20)

Mesonotum polished black; head light gray; antennae and femora black; knobs of halteres light yellow; wings with a dusky tinge; venation of medial field very variable, cell  $M_2$  closed or open by the atrophy of various veins; male hypopygium with the outer dististyle unequally trilobed at apex, inner dististyle a yellow boomerang-shaped rod; gonapophysis a long slender rod, narrowed to the acute tip; aedeagus profoundly bifid, each half produced into a slender terminal rod.

Male. — Length about 4-4.5 mm.; wing 4-5 mm.; antenna about 0.7-0.9 mm.

Rostrum and palpi black. Antennae short, black throughout; flagellar segments oval, the more basal ones longer than their verticils. Head light gray.

Pronotum black, the posterior part, with the pretergites, light yellow. Mesonotum polished black; scutellum orange-yellow; posterior borders of scutal lobes restrictedly yellow. Pleura and pleurotergite dark gray pruinose. Halteres with base of stem darkened, the outer end paler, knob light yellow. Legs with the coxae darkened, trochanters a little paler; femora black, in cases the posterior pair a little less intensely so; tibiae and tarsi brown, the outer tarsal segments black. Wings (Fig. 13) with a dusky tinge; veins light yellow. Venation:  $Sc_1$  ending nearly opposite  $R_2$ , the latter usually subequal to or shorter than  $R_{2+3}$ ; outer medial field unusually variable, with cell  $1st\ M_2$  generally closed, small, in cases open by the atrophy of  $m$ , in others by the atrophy of the basal section of  $M_3$ , while in very rare cases the distal section of vein  $M_3$  lies free in the membrane, with its basal section and  $m$  both atrophied;  $m-cu$  at or close to fork of  $M$ ; anal veins divergent,  $2nd\ A$  nearly straight.

Abdomen brownish black, the outer apical angles of the intermediate and outer tergites yellow, more extensive on the outer segments, in some cases narrowly including the central section; sternites similarly colored, the yellow borders more nearly continuous; hypopygium relatively large, dark castaneous brown. Male hypopygium (Fig. 20) with the tergite,  $9t$ , narrowed outwardly, the margin truncate, with a slight median incision. Mesal face of basistyle,  $b$ , produced into a weak finger-like lobe. Dististyles,  $d$ , nearly terminal, the outer style blackened, short-stemmed, at apex expanded into two divergent lobes, with an additional lower intermediate protuberance, the margins of these lobes microscopically scabrous; inner style a yellow rod that is shaped like a boomerang. Gonapophysis,  $g$ , appearing as a long slender rod, incurved and narrowed to the acute tip. Aedeagus,  $a$ , profoundly bifid, each half produced into a slender terminal rod that ends in a small acicular point, the blade of either side split posteriorly from the central basal part.

Holotype, ♂, Steese Highway, Alaska, MP 39, on banks of Chatanika River, July 10, 1952 (Carson). Paratopotypes, ♂♂. The occurrence of this fly was discussed earlier in the present report.

I take unusual pleasure in naming this very distinct fly for the collector, Mr. David Lyman Carson, to whom we owe much of our present detailed knowledge of the crane flies of interior Yukon and Alaska. In the Nearctic region the nearest allies are *Erioptera (Psiloconopa) cramptonella* Alexander and *E. (P.) shoshone* Alexander, both of which have the male hypopygium entirely different.

*Erioptera (Psiloconopa) churchillensis* Alexander

*Erioptera (Psiloconopa) churchillensis* Alexander, *Bull. Brooklyn Ent. Soc.*, 33 (1938): 77-78.

This fly is still known only from the unique type female, taken at Fort Churchill, Manitoba, July 10, 1936, by H. E. McClure. It is evidently most nearly related to *Erioptera (Psiloconopa) angularis* (Alexander), still known only from the vicinity of the Great Salt Lake, Utah. This latter, in turn, is exceedingly close, if not actually conspecific with, *E. (P.) stictica* Meigen, of Europe. Edwards and others have referred *stictica* to the subgenus *Symplecta* Meigen, despite the lack of a supernumerary crossvein in cell  $R_3$  of the wings. If *Symplecta* and *Psiloconopa* are to be maintained as distinct subgenera it would seem to me that the chief feature available for distinguishing the two is the presence or absence of this crossvein and accordingly I am retaining the present fly, with *stictica*, in *Psiloconopa*. It may be re-emphasized that many so-called subgeneric groups in the family are being maintained on similar or comparably insufficient grounds.

*Erioptera (Psiloconopa) denali*, new species

(Figs. 22, 26)

General coloration of mesonotum dark brownish gray, the thoracic pleura chiefly yellow, restrictedly patterned with darker on the anepisternum, sternopleurite, and meron; rostrum yellow; antennal scape yellow, remainder of organ black; legs dark brown; wings relatively narrow, tinged with brown;  $Sc$  short,  $Sc_2$  approximately opposite or shortly beyond origin of  $Rs$ ; cell  $1st\ M_2$  closed or open by atrophy of basal section of  $M_3$ ;  $m-cu$  before fork of  $M$ , in cases up to its own length; hypopygium clear light yellow, the interbasal spine slender, pale; both dististyles blackened, the outer style with its distal end densely short spinous; inner gonapophyses appearing as relatively short blackened blades; aedeagus terminating in two divergent blades, narrowed to apical points.

Male. — Length about 3.2-3.3 mm.; wing 3.7-3.8 mm.

Rostrum obscure yellow; palpi black. Antennae with scape light yellow, remainder black; flagellar segments oval to long-oval, the verticils relatively short. Head dark gray.

Pronotum yellow, narrowly darkened medially, the sides, with the pretergites, yellow. Mesonotum dark brownish gray, the humeral and lateral parts of the praescutum yellow; lateral borders of mediotergite and all but ventral margin of pleurotergite yellow, the latter brownish gray. Pleura yellow, restrictedly patterned with brownish gray on the ventral anepisternum, ventral sternopleurite, and meron. Halteres yellow. Legs with the coxae and trochanters yellow, the fore coxae slightly darker; remainder of legs dark brown, the femora even darker, except basally. Wings (Fig. 22) relatively narrow, tinged with brown, the stigmal region vaguely darker; veins brown. Venation: *Sc* relatively short, *Sc*<sub>1</sub> ending a short distance before fork of *Rs*, its outer end lying very close to costa, *Sc*<sub>2</sub> far basad, opposite or just beyond origin of *Rs*; outer medial field variable, in cases cell 1st *M*<sub>2</sub> closed, small, in other specimens open by atrophy of basal section of *M*<sub>3</sub>; *m-cu* variable in position, from shortly before fork of *M* to approximately its own length before this point (in holotype, as figured); anal veins divergent, 2nd *A* gently curved.

Abdominal tergites dark brown, the lateral borders of the more proximal segments yellow, the posterior margins of the intermediate segments very narrowly to scarcely brightened; sternites obscure yellow; hypopygium clear light yellow. Male hypopygium (Fig. 26) with the region of the tergite slightly produced, provided with strong setae. Basistyle, *b*, relatively elongate. Two dististyles, *d*, both blackened; outer style a stout clavate lobe, its outer third with dense short spinous points; inner style shorter, the outer end decurved. Phallosome, *p*, with two pairs of gonapophyses, the outer or lateral pair long and slender, pale, appearing almost like interbases; inner apophyses appearing as relatively short blackened blades, the tips narrowly acute, in a position of rest projecting ventrad. Aedeagus with the two arms appearing as divergent blades, narrowed into apical points, the duct occupying the inner or upper margin of each blade.

Holotype, ♂, McKinley National Park, Alaska, Teklanika River, July 20, 1952 (Alexander and Carson). Paratopotypes, ♂♂, with the type.

The specific name, *denali*, is the native name for Mount McKinley, translated as meaning "home of the sun." The species is most similar to *Erioptera (Psiloconopa) mckinleyana*, new species, differing in coloration, venation, and, especially, in the structure of the male hypopygium.

*Erioptera (Psiloconopa) estella*, new species

(Figs. 14, 15, 21)

Allied to *areolata*; general coloration of thorax brownish gray, the pleura more yellowed, sparsely pruinose; femora obscure yellowish brown, the tips brownish black; wings brownish yellow; *Sc*<sub>1</sub> ending about opposite *R*<sub>2</sub>; cell 1st *M*<sub>2</sub> normally closed, in cases open; male hypopygium with the ninth tergite produced into two low blackened plates; outer dististyle bifid, the inner arm again divided into two blades, roughly mitten-shaped in outline; inner and outer spines of the gonapophyses widely separated.

Male. — Length about 3-4.5 mm.; wing 3.8-5.5 mm.

Female. — Length about 5 mm.; wing 6 mm.

Rostrum brownish gray; palpi black. Antennae with the scape and pedicel reddish brown, flagellum darker brown; flagellar segments oval, slightly more elongate outwardly; verticils short. Head brownish gray behind, clearer gray on the broad anterior vertex.

Pronotum brown, the scutellum and pretergites light yellow. Mesonotum brownish gray, the praescutum without distinct stripes; pseudosutural foveae and tuberculate pits black; parascutella and posterior part of scutellum paler; anterolateral borders of mediotergite and most of pleurotergite yellow. Pleura more yellowed, sparsely pruinose, the ventral sternopleurite and meron darker, more heavily pruinose. Halteres yellow. Legs with the coxae and trochanters yellow, fore coxae a little darker; femora obscure yellow basally, passing into brown, the tips brownish black; tibiae brown, the tips blackened; tarsi brownish black. Wings (Figs. 14, 15) brownish yellow, the stigmal region scarcely darker, prearcular and costal regions somewhat clearer yellow; veins brown, brighter in the yellowed portions. Venation:  $Sc_1$  ending about opposite  $R_2$ ,  $Sc_2$  at near one-third to one-fourth the length of  $Rs$ ; cell  $1st\ M_2$  normally closed, small, in cases open, as figured;  $m-cu$  close to or shortly before fork of  $M$ ; vein  $2nd\ A$  relatively short and nearly straight.

Abdominal tergites brownish gray, the lateral borders yellow; sternites, obscure yellow; hypopygium clear light yellow. Male hypopygium (Fig. 21) with the tergite,  $9t$ , transverse, the posterior border on either side of the midline produced into two low blackened plates that are separated by a V-shaped notch, their margins microscopically serrulate. Basistyle,  $b$ , produced apically into a lobe that extends caudad virtually to the apex of the outer dististyle. Outer dististyle,  $d$ , bifid, the outer arm a relatively short curved blade, the inner arm flattened, subdivided into a large and a smaller blackened blade, roughly suggesting a mitten; inner style entirely pale. Gonapophysis,  $g$ , with the outer spine slender, indistinctly toothed on outer margin before tip, widely separated from the small inner spine.

Holotype, ♂, McKinley National Park, Alaska, Teklanika River, July 20, 1952 (Alexander). Allotopotype, ♀. Paratopotypes, ♂ ♀, July 20-21, 1952 (Alexander, Carson, and Smith).

*Erioptera (Psiloconopa) estella* is named in honor of Dr. Marion Estelle Smith, leader of the Smith party to Alaska and the Yukon in 1952, and to whom I am indebted for many new and rare Tipulidae taken on this trip and on others to the western United States and Canada. It differs from other allied species of the *areolata* group, including *E. (P.) margarita* Alexander and *E. (P.) sachalina* Alexander, by the dark body coloration and, especially, the structure of the male hypopygium, particularly the outer dististyle and gonapophyses. Some specimens of the type series are much smaller than others but from the structure of the hypopygium are evidently identical.

*Erioptera (Psiloconopa) hygropetrica* Alexander

*Erioptera (Ilisia) hygropetrica* Alexander, *Amer. Midl. Nat.*, 29 (1943): 172-74, Fig. 30 ( $\sigma$  hypopygium).

Alaska: McKinley National Park, Teklanika River, July 15-20, 1952 (Alexander and Carson); Kenai Peninsula, Kern Creek, July 24, 1952 (M. E. Smith); Steese Highway, MP 39, Chatanika River, July 10, 1952 (Alexander).

*Erioptera (Psiloconopa) mabelana*, new species

(Figs. 23, 27)

Size medium (wing, male, 5 mm.); general coloration of thorax gray, the dorsum vaguely patterned with brown; antennae black throughout; knobs of halteres infuscated; wings weakly darkened, with restricted brown areas;  $Sc_1$  very long,  $m-cu$  about two-thirds its length before fork of  $M$ ; vein  $2nd\ A$  shortly sinuous near outer end; male hypopygium with the outer dististyle blackened, trispinous; gonapophysis appearing as a broad blackened blade, the apex microscopically toothed, the inner apical angle with the point stronger.

Male. — Length about 4.5 mm.; wing 5 mm.; antenna about 0.7 mm.

Rostrum and palpi dark brown. Antennae black throughout, the scape pruinose; basal flagellar segments short-oval, the outer ones more elongate, verticils about as long as the intermediate segments. Head dark gray.

Thorax dark gray, the praescutum vaguely patterned with brown, the lateral lines broader and more distinct; scutellum yellowish brown, with a darker central line. Pleura gray, vaguely patterned with yellow, especially on the pteropleurite; dorsopleural membrane yellow. Halteres with stem whitened, knob infuscated. Legs with the coxae testaceous yellow; trochanters yellow, the apices of the posterior pair darkened; remainder of legs dark brown. Wings (Fig. 23) weakly darkened, with a restricted still darker pattern, the areas diffuse, with ill-defined margins; chief markings at origin of  $Rs$ ,  $Sc_2$ , cord, outer end of cell  $1st\ M_2$ , and tip of  $R_{1+2}$ ; paler brown clouds in anal cells; prearcular field whitened; veins brown, whitened in the prearcular field. Venation:  $Sc_1$  ending nearly opposite  $R_2$ ,  $Sc_2$  just beyond origin of  $Rs$ , vein  $Sc_1$  thus very long;  $R_2$  and  $R_{2+3}$  subequal,  $R_{1+2}$  long;  $m-cu$  about two-thirds its length before fork of  $M$ ; vein  $2nd\ A$  shortly sinuous near outer end.

Abdomen dark brown, the basal sternites somewhat paler; hypopygium dark brown. Male hypopygium (Fig. 27) with the tergite,  $9t$ , transverse, emarginate medially behind, the posterior border not markedly produced. Both dististyles,  $d$ , terminal in position, the outer a little longer, appearing as a short blackened club, the apex trispinous, including the apical lobe; inner style subequal in length, obtuse. Gonapophysis,  $g$ , appearing as a broad blackened blade, the inner apical angle produced into a stout spine, the remainder of apex truncate, with small acute points. Aedeagus

oval, flattened, apparently produced into two acute points, about as shown (this part of type slide defective).

Holotype, ♂, Lake Creek, Yukon, AHMP 1152, July 7, 1952 (Alexander).

This unusually interesting *Erioptera* is named in honor of Mrs. Alexander (Mabel Marguerite Alexander), companion and helpmate on many collecting trips throughout North America. Superficially, it resembles *Erioptera (Symplecta) sunwapta* Alexander and some allied species, but lacks the supernumerary crossvein in cell  $R_3$  of the wings and has the structure of the male hypopygium quite distinct. The occurrence in nature is discussed earlier in this report.

*Erioptera (Psiloconopa) margarita* Alexander

*Erioptera margarita* Alexander, *Bull. Brooklyn Ent. Soc.*, 14 (1919): 104-5.

Alaska: Along Worthington River, at the Worthington Glacier, Richardson Highway MP 29, July 27, 1952 (Alexander).

Yukon: Cracker Creek, AHMP 987, July 4, 1952 (Alexander).

*Erioptera (Psiloconopa) mckinleyana*, new species

(Figs. 24, 28)

General coloration of mesonotum dark brown, the praescutum with four paler more brownish gray stripes; thoracic pleura chiefly yellow, restrictedly patterned with darker; rostrum brown; antennal scape yellow, the remainder black; legs black, the femoral bases paler; wings with a strong brownish tinge;  $Sc$  long,  $Sc_1$  ending about opposite fork of  $Rs$ ,  $Sc_2$  at near one-fifth the length of  $Rs$ ; cell  $M_2$  open by the atrophy of basal section of  $M_3$ ;  $m-cu$  just before fork of  $M$ ; male hypopygium with the outer dististyle blackened outwardly, the apical angle produced into a strong spine, the remainder of apex with relatively few stout spines; phallosome with the outer apophyses appearing as very long slender incurved spines, the inner apophyses shorter but slender; aedeagus appearing as two divergent blades that narrow to apical points.

Male. — Length about 4 mm.; wing 4.8 mm.

Rostrum brown; palpi black. Antennae with scape light yellow, the remainder black; flagellar segments oval, the verticils about equal in length to the segments. Head dark gray.

Pronotum obscure yellow, clearer on sides, narrowly darkened medially; scutellum and pretergites light yellow. Mesonotal praescutum with the ground dark brown, with four paler, more brownish gray stripes, humeral region light yellow; pseudosutural foveae and tuberculate pits black, the latter lying a little anterior to the level of the former; scutum brownish gray, vaguely patterned with darker; scutellum obscure orange yellow, with a narrow central darkening; postnotum brownish gray, the antero-lateral border of the mediotergite yellow; pleurotergite chiefly darkened.

Pleura yellow, patterned with brown on the anepisternum, ventral sternopleurite and ventral meron, most extensive on the last. Halteres with stem pale, weakly darkened before the yellow knob. Legs with the coxae yellow, the fore pair darker; trochanters darker yellow; remainder of legs black, the femoral bases obscure brownish yellow; Wings (Fig. 24) with a strong brownish tinge, scarcely patterned; prearcular field paler; veins brown. Venation:  $Sc$  long,  $Sc_1$  ending about opposite fork of  $Rs$ ,  $Sc_2$  at near one-fifth to one-sixth the length of  $Rs$ , the latter long and straight, its base lying close to  $R$ ; cell  $M_2$  open by the atrophy of basal section of  $M_3$ ;  $m-cu$  just before fork of  $M$ ; anal veins divergent,  $2nd A$  gently arcuated.

Abdominal tergites dark brownish gray, sternites paler; hypopygium brownish yellow. Male hypopygium (Fig. 28) with the tergite,  $9t$ , narrow, the posterior border gently emarginate, the surface with relatively few setae. Dististyles,  $d$ , terminal, the outer style blackened on outer half, the outer apical angle produced into a strong spine, the remainder of apex with relatively few stout spines; inner style a little shorter, pale throughout, nearly parallel-sided, the apex truncated, obtuse. Phallosome,  $p$ , with the outer apophyses appearing as very long slender incurved blackened spines, the inner apophyses much shorter but similarly blackened; in the unique type these latter are slightly unequal in length on the two sides, the shorter one with a few microscopic denticles on outer face at near two-thirds the length. Aedeagus appearing as two divergent horns, their tips relatively long-produced.

Holotype, ♂, McKinley National Park, Alaska, Teklanika River, July 15, 1952 (Alexander).

The present fly is most similar to *Erioptera (Psiloconopa) denali*, new species, which is evidently the closest ally, differing in details of coloration of the body, legs, and wings and, especially, in the structure of the male hypopygium, particularly both dististyles and the gonapophyses.

*Erioptera (Psiloconopa) megarhabda* (Alexander)

*Ormosia (Ormosia) megarhabda* Alexander, *Amer. Midl. Nat.*, 29 (1943): 174-75, Fig. 36 (♂ hypopygium).

Alaska: Kenai Peninsula, Anchor River, July 25, 1952 (Carson).

*Erioptera (Psiloconopa) shoshone* Alexander

*Erioptera (Psiloconopa) shoshone* Alexander, *Amer. Midl. Nat.*, 33 (1945): 430-32, Fig. 38 (♂ hypopygium).

Alaska: AHMP 1462, Banner Creek, July 10, 1952 (Alexander).

Yukon: AHMP 1006, Marshall Creek, July 4, 1952 (Alexander and Carson); AHMP 987, Cracker Creek, July 4, 1952, on beds of fireweed and horsetail; AHMP 872, Judas Creek, July 3, 1952, very abundant on fireweed, still in bud (Alexander).

British Columbia: AHMP 128, along small stream, swept from willow, dwarf birch, and shrubby cinquefoil, June 25, 1952 (Alexander).

*Erioptera (Symplecta) cana* (Walker)

(Fig. 33)

*Limnobia cana* Walker, *List Dipt. Brit. Mus.*, 1 (1848): 48.*Erioptera (Symplecta) cana* Edwards, *Trans. Soc. Brit. Ent.*, 5 (1938): 126, Fig. 24 A, h ( $\sigma^7$ hypopygium).

Edwards studied Walker's type specimen of this fly and found that the species was distinct from *hybrida* (Meigen), and, as far as known, was restricted to the New World where it has an unusually wide range in North America.

Yukon: AHMP 919, White Horse Rapids, Yukon (Lewes) River, July 3, 1952 (Alexander); AHMP 632, Watson Lake Camp, June 28, 1952 (Carson and Smith); Haines Highway, MP 118, Unahint (Klukshu) River, July 5, 1952 (Carson and Smith).

British Columbia: AHMP 455, Muncho Lake, June 26-27, 1952 (Alexander and Carson); AHMP 118, June 24, 1952 (Alexander).

Alberta: Provincial Park, Little Smoky River, June 22, 1952, swept from willows and *Eleagnus* along river flats (Alexander, Carson, and Smith).

Male hypopygium (Fig. 33) with the apex of basistyle, *b*, produced into a stout ventral lobe, the dististyles, *d*, being subterminal in position; outer style expanded distally, the apical margin strongly concave. Outer lobe of gonapophysis, *g*, obtuse, not produced at apex.

*Erioptera (Symplecta) hybrida* (Meigen)

(Fig. 34)

*Limonia hybrida* Meigen, *Klass.*, 1 (1804): 57.*Erioptera (Symplecta) hybrida* Edwards, *Trans. Soc. Brit. Ent.*, 5 (1938): 126, Fig. 24 A, g ( $\sigma^7$ hypopygium).

Until the present writing, it was believed that this species was found only in the Old World, where it has a vast range throughout much of the Palearctic region. A few records of the fly from Alaska are now available.

Alaska: Matanuska, August 9, 1944 (J. C. Chamberlin); Glenn Highway, MP 300, August 2, 1952 (Carson).

Male hypopygium (Fig. 34) with the basistyle, *b*, scarcely produced at apex, the dististyles, *d*, being terminal in position or virtually so; outer style more parallel-sided, the apical margin straight or virtually so. Outer lobe of gonapophysis, *g*, somewhat produced at apex.

*Erioptera (Symplecta) sheldoni*, new species

(Figs. 30, 35)

General coloration brownish gray; praescutum with four brownish gray stripes, the interspaces darker; legs brownish black to black; wings dusky, patterned with diffuse darker brown areas; *m* shorter than the basal section of *M*<sub>3</sub>; abdomen dark brown, the borders of the segments narrowly yellow; male hypopygium with the outer dististyle compact, the

beak very obtuse, the outer margin with two powerful erect spines; gonapophysis appearing as a slender black rod, the outer margin of approximately the basal half with conspicuous teeth; aedeagus blackened basally, produced into two very long and slender more yellowed points.

Male. — Length about 4-5 mm.; wing 5-6.3 mm.; antenna about 0.8-0.9 mm.

Female. — Length about 5.5 mm.; wing 5.5 mm.

Rostrum gray; palpi black. Antennae black throughout; flagellar segments oval, becoming smaller outwardly, the intermediate ones about as long as their verticils. Head brownish gray.

Pronotum brownish gray, variegated with obscure yellow, the pretergites brighter. Mesonotal praescutum with the ground brownish black, with four brownish gray stripes, the intermediate pair narrowly separated by a ground line; remainder of notum brownish gray, the posterior border of the scutellum vaguely more yellowed. Pleura brownish gray, with a narrow clearer gray ventral stripe; metapleura restrictedly yellowed. Halteres with stem yellow, knob dark brown. Legs with the coxae light gray; trochanters yellow; remainder of legs brownish black to black. Wings (Fig. 30) with a dusky tinge, patterned with darker brown about as in other species of the subgenus, the markings more or less diffuse and ill-delimited; in the holotype with two additional darker clouds along  $R_s$ , not evident in most other specimens; veins brown,  $Sc$  and prearcular veins pale. Venation:  $R_2$  at fork of  $R_{2+3+4}$  (in holotype, as figured) or beyond, in cases  $R_{2+3}$  exceeding  $R_2$  alone;  $m$  shorter than basal section of  $M_3$ ;  $m-cu$  far before fork of  $M$ , in cases to nearly twice its length (in holotype, as figured); vein 2nd  $A$  strongly sinuous on outer third.

Abdomen dark brown, the borders of the segments narrowly yellow; hypopygium yellow. Male hypopygium (Fig. 35) with the tergite,  $9t$ , emarginate. Dististyles,  $d$ , terminal, blackened, the outer style compact, its outer or beak portion very obtuse, the outer margin with two powerful erect spines, the outermost larger and more curved; inner dististyle obtuse at apex. Gonapophysis,  $g$ , appearing as a slender black rod, the outer margin of approximately the basal half with conspicuous teeth, in cases these more reduced and crowded. Aedeagus,  $a$ , blackened basally, produced into very long and slender more yellowed points.

Holotype, ♂, McKinley National Park, Alaska, Teklanika River, July 20, 1952 (Alexander). Paratopotypes, ♂ ♀.

The species is dedicated to the memory of Charles Sheldon, pioneer naturalist in the McKinley National Park, whose major work thereon, *The Wilderness of Denali*, is cited in the References presented earlier. The fly is quite distinct from other described species in the structure of the male hypopygium, particularly the outer dististyle, gonapophysis, and aedeagus.

*Erioptera (Symplecta) sunwapta* Alexander

(Figs. 31, 36)

*Erioptera (Symplecta) sunwapta* Alexander, *Ent. News*, 63 (1952): 267-69.

Alaska: AHMP 1438, Tanana River, at Big Delta bridge, July 9, 1952 (Alexander); Tonsina River, Richardson Highway MP 81, July 26, 1952 (Alexander); Matanuska, in rotary trap, May 27-June 13, 1944 (J. C. Chamberlin); Kern Creek, Kenai Peninsula, July 23, 1952 (Alexander, Carson, and Smith).

Yukon: Lake Creek, AHMP 1152, July 7, 1952 (Alexander); AHMP 1055, Kluane Lake, July 7, 1952, associated with *Erioptera (Arctoconopa) kluane*, new species, and *E. (Erioptera) yukonensis*, new species (Alexander); AHMP 987, Cracker Creek, July 4, 1952 (Alexander).

Alberta: Sunwapta Pass, on border between Banff and Jasper National Parks, altitude 6670 feet, July 21-August 5, 1949 (Alexander), types.

Male hypopygium (Fig. 36) with the dististyles, *d*, terminal in position, the outer style blackened, the outer margin before apex with a powerful erect spine, and usually with a much smaller point lying more basally; lower margin of style on outer half with a long low flange; inner style a flattened blade, the outer part more expanded. Gonapophysis, *g*, appearing as a flattened blade that narrows into an acute black spine, the surface of the blackened part with abundant delicate setae. Aedeagus, *a*, produced into two rods, each with a small acute point on margin some distance back from apex, the more basal part expanded into a flange.

*Erioptera (Hoplolabis) asiatica* Alexander

(Figs. 25, 29)

*Erioptera (Hoplolabis) asiatica* Alexander, *Ann. Ent. Soc. Amer.*, 11 (1918): 447-48.

Described from Kyoto, Japan; now known to be widely distributed in Japan and elsewhere in northeastern Asia, including north China, Korea, and eastern Siberia. In the present survey, the fly was found to be widely distributed in interior Alaska.

Alaska: Steese Highway MP 39, along the Chatanika River, July 10, 1952 (Alexander, Carson, and Smith); Moose Creek, on western boundary of McKinley National Park, July 18, 1952 (Alexander); Richardson Highway MP 81, Tonsina River, July 26, 1952 (Alexander).

The male hypopygium (Fig. 29) shows some variation. Even in material from and near the type locality in Japan there are slight differences in conformation of the dististyles and the gonapophyses. In the present specimens, as shown, the apical lobe of the basistyle, *b*, is long and slender, with unusually long setae on the mesal face. Inner dististyle, *d*, blackened and more or less acute at apex. Gonapophysis, *g*, elongate, pointed at tip, the margins microscopically serrulate; basal spine variable, from very reduced to long, even in material from a single locality. The venation is shown (Fig. 25).

*Erioptera (Erioptera) bryantiana* Alexander*Erioptera (Erioptera) bryantiana* Alexander, *Journ.N.Y.Ent.Soc.*, 37 (1929): 49-50.

Still known only from the type locality, Bilby, Alberta, west of Edmonton.

*Erioptera (Erioptera) kluaneana*, new species

(Fig. 37)

Allied to *yukonensis*; general coloration of thorax dark brownish gray, the praescutum with three vague darker lines; pleura dark brownish gray; knob of halteres blackened; legs dark brown to brownish black; wings with a weak brownish tinge, the prearcular and costal fields more yellowed; male hypopygium with the outer dististyle a blackened cultriform blade, the inner margin with a low flange; inner dististyle with the apex strongly recurved, provided with several setigerous punctures; arms of aedeagus long and very slender, recurved, untoothed.

Male. — Length about 5.5 mm.; wing 6.2 mm.

Female. — Length about 6 mm.; wing 6.5 mm.

Rostrum brownish testaceous; palpi black. Antennae black; flagellar segments oval to long-oval. Head gray.

Pronotum dark gray, the lateral borders and pretergites restrictedly yellow. Mesonotal praescutum, scutum, and scutellum dark brownish gray, the praescutum with three vague darker lines; pseudosutural foveae black; parascutella and postnotum, especially the pleurotergite, yellowed. Pleura chiefly dark brownish gray, only vaguely patterned with paler; dorsopleural membrane yellow. Halteres with stem yellow, knob blackened. Legs with the coxae and trochanters yellow; remainder of legs dark brown to brownish black. Wings with a weak brownish tinge, the prearcular and costal fields more yellowed; stigmal region and axilla vaguely more darkened; veins brown, yellowed in the brightened fields. Venation:  $Sc_1$  ending a short distance beyond  $R_2$ ,  $Sc_2$  at near two-fifths the length of  $R_s$ ;  $m-cu$  at fork of  $M$ ; vein  $2nd\ A$  strongly sinuous.

Abdomen dark brown to brownish black, the genitalia of both sexes brownish yellow. Male hypopygium (Fig. 37) with the posterior border of tergite subtruncate, the median area a trifle produced. Outer dististyle a blackened cultriform blade, the inner margin of more than the outer half produced into a low flange of uniform width; inner style with the apex strongly recurved, provided with several setigerous punctures, the outer margin of the basal part similarly roughened. Gonapophysis,  $g$ , appearing as a narrow blade, the outer third blackened, the tip acute. Arms of aedeagus,  $a$ , long and very slender, recurved, without a marginal tooth, as in *yukonensis*.

Holotype, ♂, Kluane Lake, Yukon, AHMP 1055, July 7, 1952 (Alexander). Allotopotype, ♀, pinned with type.

Although generally similar to *Erioptera (Erioptera) yukonensis*, new species, I regard the present fly as being distinct, differing especially in

the structure of the male hypopygium, particularly the inner dististyle and the aedeagus.

*Erioptera (Erioptera) uliginosa* Alexander

*Erioptera (Erioptera) uliginosa* Alexander, *Occ. Papers Boston Soc. Nat.Hist.*, 5 (1930): 277-78.

*Erioptera (Erioptera) uliginosa* Alexander, *Diptera Connecticut, Tipulidae*, 1942, p. 453, Fig. 52 E (♂ hypopygium).

Alaska: Blueberry Lake, 1 mile south of Anchorage, in bog, July 28, 1952 (C. O. Berg).

*Erioptera (Erioptera) villosa* Osten Sacken

*Erioptera villosa* Osten Sacken, *Proc. Acad.Nat.Sci. Phila.*, 1859, p. 226.

*Erioptera (Erioptera) villosa* Alexander, *Diptera Connecticut, Tipulidae*, 1942, p. 456, Fig. 52 G (♂ hypopygium).

British Columbia: AHMP 496, Liard Hot Springs, June 28, 1952 (Alexander).

*Erioptera (Erioptera) yukonensis*, new species

(Figs. 32, 38)

Allied to *lutea*; general coloration of mesonotal praescutum dark brown, the humeral region vaguely yellowed; rostrum yellow; antennae dark brown throughout; pleura yellowed, sparsely pruinose; halteres yellow, knobs infuscated; legs dark brown, the femoral bases obscure yellow; wings with a brownish tinge; hypopygium brownish yellow, the posterior border of tergite not produced at midline; apical spine of inner dististyle relatively short, black, the outer margin of style produced into a rounded lobe, without a spine or roughenings; arms of aedeagus with a strong spinous tooth on outer margin before apex.

Male. — Length about 4.5-4.7 mm.; wing 5.5-5.7 mm.

Rostrum yellow; palpi dark brown. Antennae dark brown throughout, the scape pruinose; pedicel swollen; flagellar segments oval, passing into elongate; verticils long. Head with the anterior vertex yellow, the posterior part of the dorsum brownish gray.

Pronotum brown medially, yellowed on sides, including the scutellum and pretergites. Mesonotal praescutum with the disk dark brown, the interspaces shown by a row of black setae, humeral region vaguely yellowed; pseudosutural foveae reddish; scutum infuscated, scutellum orange yellow, darkened medially at base; postnotum yellow, more intense behind. Pleura yellow, sparsely pruinose. Halteres yellow, the knobs infuscated. Legs with the coxae and trochanters yellow; femora obscure yellow basally, the tips broadly dark brown; tibiae and tarsi brown. Wings (Fig. 32) with a brownish tinge, the prearcular, costal and stigmal regions

more brownish yellow; veins dark brown. Venation:  $Sc_1$  ending about opposite  $R_2$ ,  $Sc_2$  beyond midlength of  $Rs$ ;  $m-cu$  just before fork of  $M$ ; vein 2nd  $A$  very strongly sinuous.

Abdomen dark brown, the tergites more or less brightened laterally; hypopygium brownish yellow. Male hypopygium (Fig. 38) with the posterior margin of tergite,  $9t$ , broadly emarginate, not or scarcely produced at midline, the lobes low and obtuse; setae of tergite arranged in three groups, the median one with fewer setae. Basistyle,  $b$ , with the apical lobe low. Outer dististyle,  $d$ , with a conspicuous blackened flange on mesal face; inner style appearing as a flattened pale blade, at apex produced at an angle into a relatively short black spine, outer margin at near midlength dilated into a rounded lobe without a spine or roughenings. Gonapophysis,  $g$ , appearing as relatively slender rods, the slightly bent tips acute. Arms of aedeagus,  $a$ , with a strong spinous tooth or point on outer margin a short distance back from the tip.

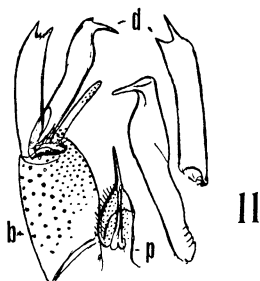
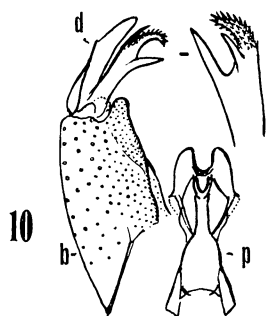
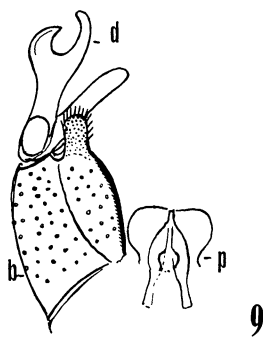
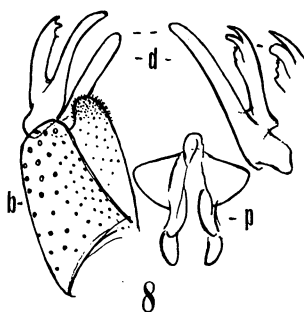
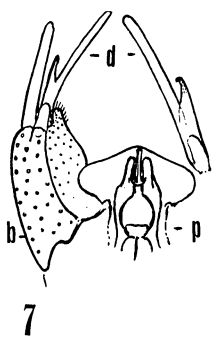
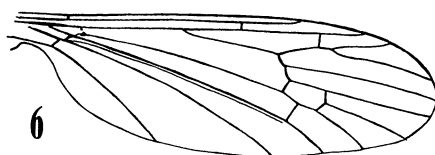
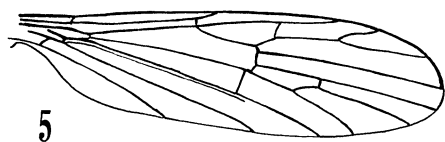
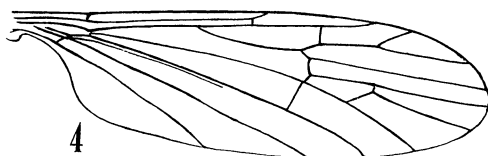
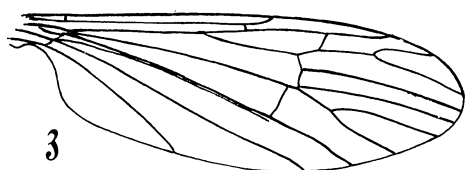
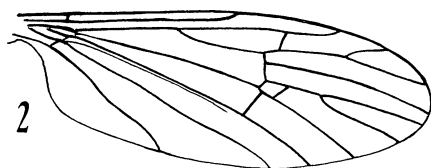
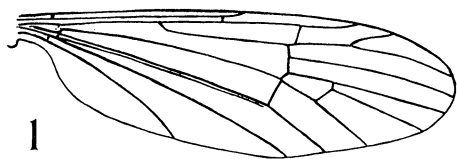
Holotype, ♂, Watson Lake Camp, Yukon, AHMP 632, June 28, 1952 (Alexander). Paratopotypes, ♂ ♀; paratype, ♂, Kluane Lake, Yukon, AHMP 1055, July 7, 1952 (Alexander), associated with *Erioptera* (*Arcticonopa*) *kluane*, new species, *E. (Symplecta)* *sunwapta* Alexander, and *E. (Erioptera)* *kluaneana*, new species.

Despite their general resemblance, the two species of the subgenus herewith described seem to be distinct in their hypopygial characters. The Palaearctic *Erioptera* (*Erioptera*) *lutea* Meigen and *E. (E.) fuscohalterata* Alexander likewise have the knobs of the halteres darkened, but differ in the coloration of the body and wings and in the details of structure of the male hypopygium, particularly the inner dististyle and aedeagus.

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- Fig. 1. *Erioptera (Empeda) rectispina*, new species; venation.  
Fig. 2. *Erioptera (Empeda) rectispina*, new species; venation.  
Fig. 3. *Erioptera (Empeda) subborealis*, new species; venation.  
Fig. 4. *Erioptera (Empeda) toklat*, new species; venation.  
Fig. 5. *Erioptera (Empeda) umiat*, new species; venation.  
Fig. 6. *Erioptera (Gonomyodes) yohoensis* Alexander: venation.  
Fig. 7. *Erioptera (Empeda) rectispina*, new species; male hypopygium.  
Fig. 8. *Erioptera (Empeda) subborealis*, new species; male hypopygium.  
Fig. 9. *Erioptera (Empeda) toklat*, new species; male hypopygium.  
Fig. 10. *Erioptera (Empeda) umiat*, new species; male hypopygium.  
Fig. 11. *Erioptera (Gonomyodes) yohoensis* Alexander; male hypopygium.

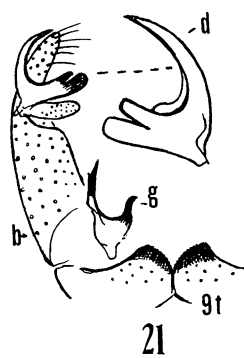
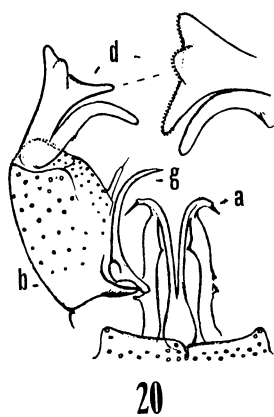
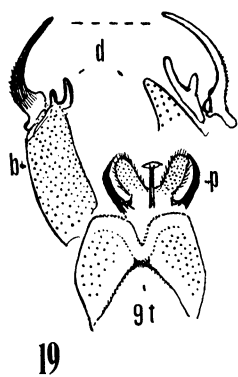
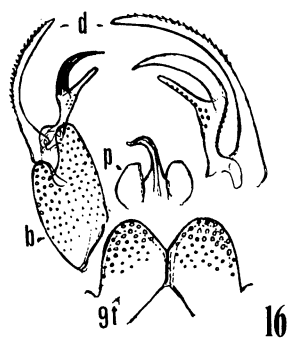
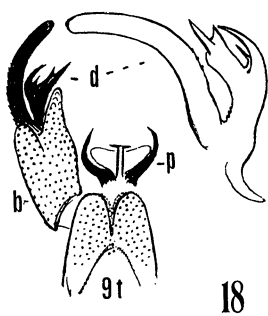
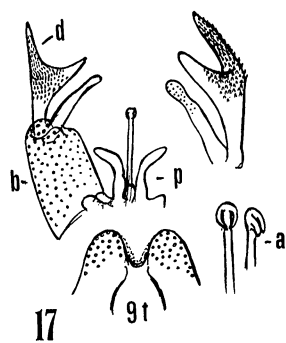
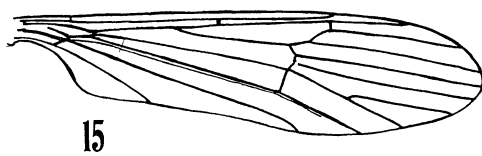
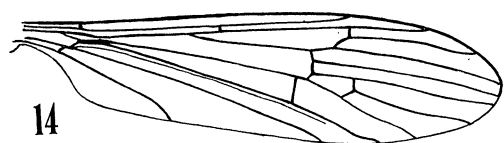
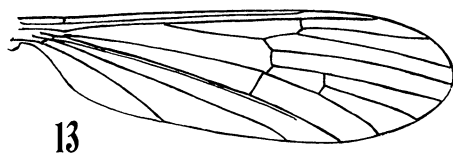
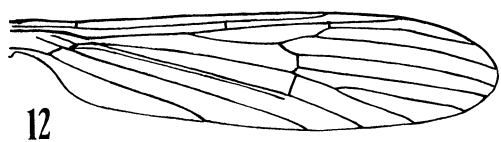
(Symbols: *b*, basistyle; *d*, dististyle; *p*, phallosome)



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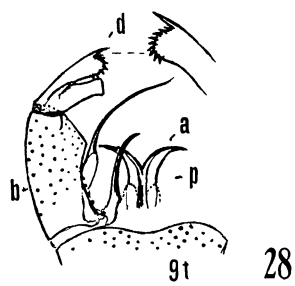
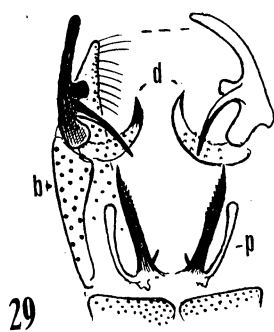
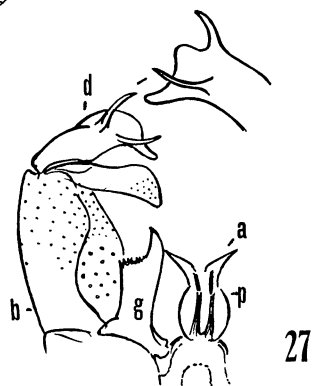
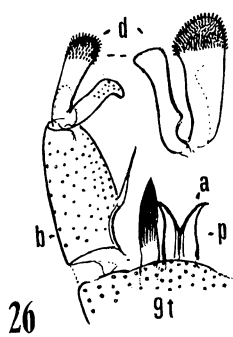
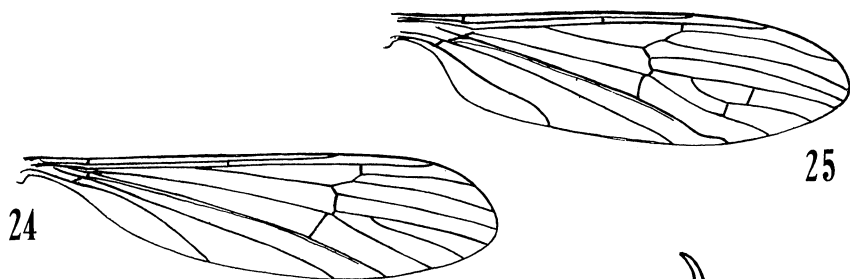
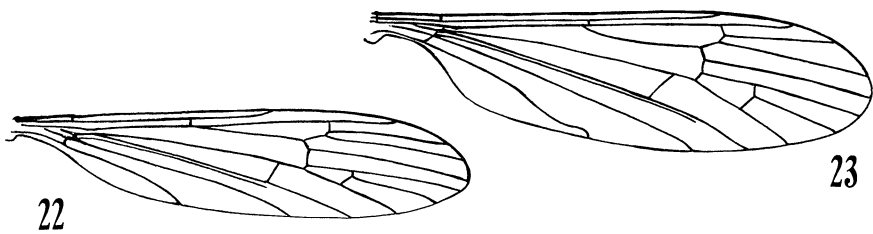
- Fig. 12. *Erioptera (Arctoconopa) kluane*, new species; venation.  
Fig. 13. *Erioptera (Psiloconopa) carsoni*, new species; venation.  
Fig. 14. *Erioptera (Psiloconopa) estella*, new species; venation.  
Fig. 15. *Erioptera (Psiloconopa) estella*, new species; venation.  
Fig. 16. *Erioptera (Arctoconopa) aldrichi* Alexander; male hypopygium.  
Fig. 17. *Erioptera (Arctoconopa) forcipata* Lundström; male hypopygium.  
Fig. 18. *Erioptera (Arctoconopa) katmai* Alexander; male hypopygium.  
Fig. 19. *Erioptera (Arctoconopa) kluane*, new species; male hypopygium.  
Fig. 20. *Erioptera (Psiloconopa) carsoni*, new species; male hypopygium.  
Fig. 21. *Erioptera (Psiloconopa) estella*, new species; male hypopygium.

(Symbols: *a*, aedeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *p*, phallosome; *t*, tergite)



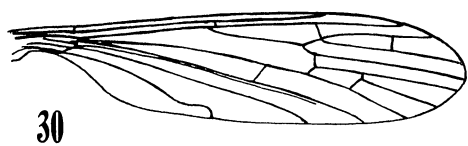
- Fig. 22. *Erioptera (Psiloconopa) denali*, new species; venation.  
Fig. 23. *Erioptera (Psiloconopa) mabelana*, new species; venation.  
Fig. 24. *Erioptera (Psiloconopa) mckinleyana*, new species; venation.  
Fig. 25. *Erioptera (Hoplolabis) asiatica* Alexander; venation.  
Fig. 26. *Erioptera (Psiloconopa) denali*, new species; male hypopygium.  
Fig. 27. *Erioptera (Psiloconopa) mabelana*, new species; male hypopygium.  
Fig. 28. *Erioptera (Psiloconopa) mckinleyana*, new species; male hypopygium.  
Fig. 29. *Erioptera (Hoplolabis) asiatica* Alexander; male hypopygium.

(Symbols: *a*, aedeagus; *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *p*, phallosome; *t*, tergite)

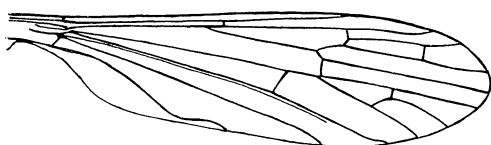


- Fig. 30. *Erioptera (Symplecta) sheldoni*, new species; venation.  
Fig. 31. *Erioptera (Symplecta) sunwapta*, new species; venation.  
Fig. 32. *Erioptera (Erioptera) yukonensis*, new species; venation.  
Fig. 33. *Erioptera (Symplecta) cana* (Walker); male hypopygium.  
Fig. 34. *Erioptera (Symplecta) hybrida* (Meigen); male hypopygium.  
Fig. 35. *Erioptera (Symplecta) sheldoni*, new species; male hypopygium.  
Fig. 36. *Erioptera (Symplecta) sunwapta* Alexander; male hypopygium.  
Fig. 37. *Erioptera (Erioptera) kluaneana*, new species; male hypopygium.  
Fig. 38. *Erioptera (Erioptera) yukonensis*, new species; male hypopygium.

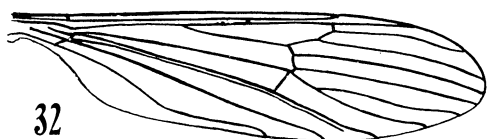
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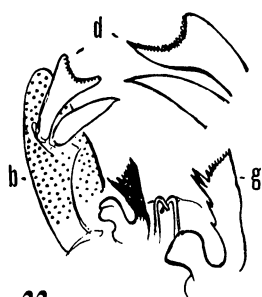
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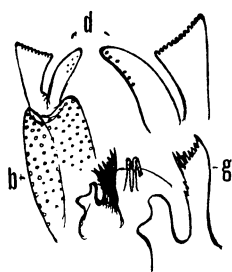
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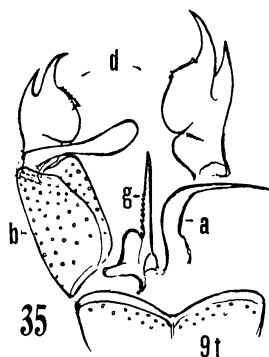
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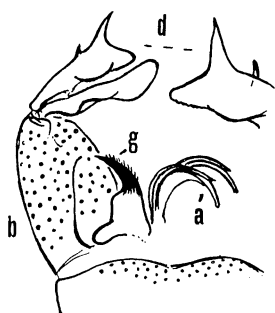


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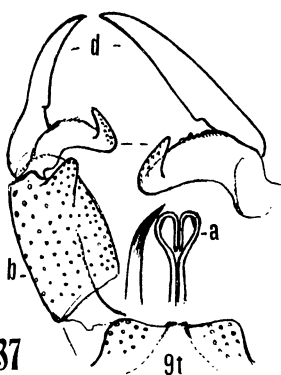


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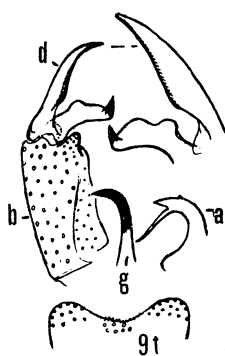


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9t



38

9t



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