

## ALASKAN SPECIES OF DIPTERA OF THE GENUS HELOPHILUS, WITH NOTES ON OTHERS.

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It appears that several of the species of *Helophilus* now known from America are considered in literature under two or more names, due mainly to the introduction of a number of European species which have been named after reaching this country, or to giving separate names to European and American specimens of species which are circumpolar as many insects are, especially in high latitudes.

Most attention has been given in this consideration to the species which have a shining stripe on the face and all such species, known to me from the Nearctic fauna, are included in the key given below, while only a few of the dozen or more of the other section of the genus are treated. Notes are given on a number of species not considered in the key in order to record some observations that may be of use to future students of the group.

Much of my material was collected in Alaska by the Katmai Expeditions of the National Geographic Society. Seven species belonging to the genus were procured in series, and pains were taken to associate the sexes, and to note such variations as were presented by each species in a study of large numbers in the field.

Additional material was furnished by Chas. W. Johnson and special interest attaches to this since it was collected in eastern localities and furnished the opportunity for a comparative study of specimens from New Foundland, Labrador and Northern Maine with my specimens from Alaska. Material in various museums was studied and the results used in the conclusions which follow. The Dr. Loew collection and the cabinet of Dr. R. C. Osburn have proven interesting, as they present for study specimens from Greenland and Labrador from whence Otto Fabricius, Staeger and Loew procured their type material. Chas. L. Fluke has aided me in getting information in regard to the type of *Helophilus bruesi* Graenicher. He agrees that it is a synonym of *borealis*.

The abdominal coloration of species of *Helophilus* with a shining facial stripe is much the same in all. Thus *groenlandicus*, which was one of the first American species described, may be considered typical. The ground color is clear black, with an interrupted band of different color on each of segments two, three and four. Segment two has a rather large triangular yellow marking on either side with the inner angles distinctly gray. Segment three has a small yellow spot, somewhat variable in size, at each anterior corner and proceeding inward from it a conspicuous narrow gray marking, which does not meet its fellow of the opposite side. Segment four has the gray markings similar, but does not have any yellow whatever. Wherever the color is yellow the black is replaced, but the gray usually is over black and can be rubbed off quite easily, leaving black in its place. In at least two forms described, *dychei* Williston and *bruesi* Graenicher, the gray abdominal markings are omitted in nature, but the yellow and black persist in typical arrangement.

1. Face, between oral margin and base of antennæ, with a shining stripe devoid of pile or pollen. . . . . 2  
Face without such a stripe, entirely pollinose. . . . . 8
2. Facial stripe yellow or at most brown. . . . . 3  
Facial stripe deep shining black. . . . . 4
3. First two segments of antenna black, front of female black pilose only near the ocelli, front of male broad. . . . . *trivittatus* Fabr.  
First two segments of antenna reddish, front of female black pilose, front of male narrow. . . . . *similis* Macquart
4. All segments of all the tarsi black. . . . . 5  
At least one basal segment of each middle tarsus yellow for its entire length. . . . . 6
5. Thoracic stripes more or less irregular, usually not distinct, two median ones usually reaching only to the posterior fourth of the mesonotum. Thorax long yellow pilose, very rarely some black pile on the scutellum. Abdomen with the black almost wholly shining, fourth segment entirely black or with a narrow, more or less obsolete, interrupted, gray-pollinose band. . . . . *borealis* Staeger.  
Thoracic stripes regular, distinct, two median ones reaching very near to the scutellum. Thorax with rather short pile which regularly is black on the disc of the scutellum, abdomen with the black color largely opaque, shining only near the incisures, fourth segment black with a distinct interrupted, gray-pollinose band. . . . . *groenlandicus* O. Fabr.
6. Hind tibia with the yellow color more extensive than the black, hind femur yellow on nearly the apical third. . . . . *pendulus* Linnaeus.  
Hind tibia with the black color plainly more extensive than the yellow, hind femur with a yellow preapical band not over one-fifth as wide as the length of the femur. . . . . 7
7. Abdominal segments three and four with the posterior margins orange, thoracic stripes prominent and uniform. . . . . *hybridus* Linnaeus.  
Abdominal segments three and four with the posterior margins shining black, thoracic stripe narrow, broken or varying in width on posterior half. . . . . *obscurus* Loew.

8. Male abdomen with a yellow elongate spot, triangular in form, on each side of the second segment, female abdomen with elongate, curved, gray spots on either side of third and fourth segments not in contact with the lateral margins. . . . . *bilinearis* Williston.  
 Both sexes with interrupted cross-bands on each of abdominal segments two, three and four, in contact with the lateral margins. . . . . 9.
9. Female abdomen with the posterior margins of segments three and four gray pollinose, male hind femora black at base. . . . . *lunulatus* Meigen.  
 Female abdomen with posterior margins of segments three and four shining, male hind femora yellow at base. . . . . *hamatus* Loew.

*Helophilus borealis* Staeger.

In the Canadian Entomologist for 1897, Hunter published a description of *Helophilus dychei* from Williston's manuscript. The type specimens were procured at Sitka, Alaska, by Prof. L. L. Dyche. I found the same species very plentiful at Kodiak and at Savonoski and procured a hundred or more specimens, fifty of which were pinned and kept for future study. In pinning these specimens all variations observed were selected and as the species proved to be a variable one the series furnishes an interesting study. The smallest specimen is nine millimeters in total length, while the largest one is nearly fifteen millimeters. About two-thirds of the specimens show no gray markings on abdominal segments two, three and four, while the other third show these markings plainly. The thoracic stripes are somewhat more prominent in some specimens than others, although these stripes are not prominent in any of the specimens. Even there is variation in the face which in some specimens is more prominent than in others.

Like many northern species, we would expect naturally that this one would extend entirely across the American Continent, and such is the case, for specimens from northern Maine and Mount Desert, Maine, as well as from some eastern localities further north, cannot be separated by any constant characters when long series are considered. In comparing Johnson's material of fifteen specimens above mentioned, labelled *glacialis*, *borealis* and *dychei*, with Alaskan material, it was possible to duplicate from the latter every specimen included in the former.

Both *Helophilus borealis* Staeger and *Helophilus glacialis* Loew are fully characterized in Williston's Synopsis of North American Syrphidæ and fully compared with *Helophilus groenlandicus* Otto Fabricius, but not with one another. The latter species is quite distinct and easily identified, but my

studies indicate that the former two names are synonyms. They are applicable to specimens with gray bands on the third and fourth abdominal segments, while *Helophilus dychei* Williston and *Helophilus bruesi* Graenicher refer to those specimens that lack these gray bands. As has been stated, some specimens show gray abdominal bands and some do not. In a series of six selected for the purpose these bands are prominent on number one and gradually become less evident until in number six they are wholly lacking, even with high magnification, yet otherwise all the specimens are of the same size, appearance and coloration.

Since *borealis* is the oldest name, it stands as the name of the species and *glacialis* Loew, *dychei* Williston, *bruesi* Graenicher, and I believe *androclus* Walker are synonyms of it.

The species has a wide distribution in North America, but I can find no record which would indicate that it is a member of the European fauna. It has been reported from Greenland, Labrador, New Foundland, Maine, Canada, Colorado, New Mexico and Wisconsin. In the southern parts of its range it occurs at high altitudes.

*Helophilus groenlandicus* Otto Fabricius.

*Helophilus groenlandicus* is very easily separated from *borealis* when specimens are at hand, but it is rather difficult to write out directions for the purpose. By using the accompanying key carefully the student should obtain the proper result. As it was named at an early date from Greenland, and as it occurs also in Northern European countries, no great surprise attaches to the fact that it has been given at least two additional names by old world dipterists. In Kertesz, Catalogue, *Helophilus arcticus* Zetterstedt and *bilineatus* Curtis are accepted synonyms, while Williston believes that *latro* Walker refers to the same species. Besides there is no very good reason for excluding *chalepus* Walker from the same synonymy.

Common at Savonoski, Alaska, where I observed many specimens and pinned nearly forty. I have seen specimens from Isle Royale, Michigan, Labrador, and New Foundland. Others have reported it from Greenland, Lapland and Europe. Specimens that I have studied are very uniform in coloration, in which respect it differs from the previous species.

*Helophilus obscurus* Loew.

Abundant at several stations along Naknek Lake, Alaska, in July, 1919. More than a score of specimens taken. The hind femur is nearly all black, only a narrow, more or less obscure preapical band yellowish. Median thoracic stripes more or less irregular and broken, an interrupted band on each of abdominal segments two, three and four. Fluke gives a full description of the species in his *Syrphidæ* of Wisconsin. Specimens are at hand also from Chippewa and Alger counties, Michigan, belonging to the University of Michigan Museum, and from Orillia, Ontario. It has been reported from Colorado, Wisconsin and Wyoming.

*Helophilus pendulus* Linn.

Plentiful at Savonoski, Alaska, in July and August, 1919. It is a common European species, but has not been reported from America heretofore. My specimens were compared with European examples in the United States National Museum and agree perfectly, except there is not so much black on the apical third of the hind tibia in Alaskan specimens. Somewhat similar to *obscurus*, but the thoracic stripes are very distinct, the hind femur has the apical third yellow and the hind tibia is more than half yellow. Kertesz' Catalogue gives *praecox* Rossi, *similis* Curtis, *trilenva* Harris, *trilineata* Harris and *trivittata* Meigen, all names given in Europe, as synonyms.

*Helophilus hybridus* Loew.

Very much of the appearance of *Helophilus similis* Macquart, but known at once from that species by the shining black stripe on the face. First recognized from North America in 1847 by Macquart when he described *Helophilus novae-scotiae* from the country after which it was named. *Helophilus latitarsis* Hunter, described in the Canadian Entomologist for 1897, from Minnesota, constitutes the second published record for America for Hunter's name is surely a synonym.

The material of *hybridus* before me consists of five specimens, a female from Caledonia, North Dakota, July 30, 1918, and a male and female from Banff, Alberta, July 17, 1902, R. C. Osburn, collector, a male from Fargo, North Dakota, May 27, 1917, P. W. Fattig, collector, and a male from Turtle Mountains, North Dakota, August 6, 1920, T. H. Hubbell, collector.

*Helophilus trivittatus* Fabricius.

This European species has been reported from the city of Mexico and Verrall published the opinion that *Helophilus latifrons* Loew, which has long been considered peculiar to America is a synonym, but later Becker announced the opinion that the two are separate.

When it is considered that a long series of specimens shows variations and also that so many related species are common to Europe and America, there are good reasons for accepting Verrall's conclusion, and his view is strengthened when one compares the specimens and descriptions available.

Kerteszi in his catalogue, following Verrall, places *latifrons* Loew in synonymy with *trivittatus* Fabricius and also includes the European names *camporum* Mg. and *parallela* Harris. Hunter reports *latifrons* from Cook Inlet, Alaska, so it occurs over a wide range in America.

*Helophilus similis* Macquart.

The shining facial stripe is yellow or brown, the front in the male is narrow, in the female wide and almost wholly black pilose. Widely distributed over North America, but not known from Europe. Chas. R. Jones records it from England, but he writes that this is an error. Walker's names *decisa* and *fasciata* and Jaennicke's *susurrans* are admitted as synonyms in all recent lists.

*Helophilus lunulatus* Meigen.

The species of the genus *Helophilus* closely related to *lunulatus* are difficult to separate. The sexes of each species are different, and often it is the case that one sex or the other of two species has fairly good distinguishing characters, but the opposite sex practically is without anything of the kind. Coquillett definitely reported *lunulatus* from Alaska in 1900. Before that date it was considered strictly European, but since it has been mentioned in several local lists and from various parts of the United States. In every case descriptions in this group of species in North America have been taken from a single specimen. Loew described *hamatus* and Hunter *pilosus* from females, and Williston had the male when he described

*bilinearis*. Because of this, one cannot depend fully upon many of the comparisons that have been made up to the present.

Both Verrall and Lundbeck have furnished full descriptions of both sexes of *lunulatus* and have pointed out that in the female the hind margins of the abdominal segments are covered by gray pollinose bands, while the descriptions of both *hamatus* and *pilosus* mention these same parts as shining. Among my material I find no specimens that show the gray posterior bands on the abdominal segments, except a series of females taken at Savonoski, Alaska. These with the males associated with them in the field, answer the description of *lunulatus* in detail and I believe should be considered as that species.

Almost all the various species near *lunulatus* appear on the wing in early spring. I have taken what I consider *bilinearis* from spring beauty, *Claytonia virginica*, which is a well known early spring flower. Specimens of other species taken in Ohio, Indiana, Michigan and Wisconsin bear date of early May. It appears that they are not so rare if looked for at the proper season. Since there are so few specimens in the collections of the country, some careful early spring collecting and field observations are very much needed.

#### *Helophilus laetus* Loew.

Loew described four nearly related species of *Helophilus* in succession in Centuria IV. Since *laetus* is the commonest species the group is often known as the *laetus* group. It is interesting to note that the ocelli are practically as remote from each other as in *Aemosyrphus*, a genus which has been split off from *Helophilus* mainly on account of that character. These species all were described from the female sex and from a limited number of specimens, consequently they have given dipterists more or less trouble and even doubt has been expressed occasionally as to the distinctness of some of them. At last it has been possible to associate the sexes of all four and establish their validity. Practically every published list of Syrphidæ in the country records *laetus*, so it has a wide distribution. Loew's description must not be taken too literally, however, for a series of specimens shows quite a range of variations in color markings of legs and abdomen. Hunter finds by a study of the type that *Helophilus aureopilus* Towns is a synonym..

*Helophilus divisus* Loew.

On page 138 of Volume 29 of the Canadian Entomologist, Dr. W. D. Hunter has characterized this species. The male, although quite variable in coloration of body and legs, may be known among American species of its genus by the prominent tubercle on the under side, near the base of each hind femur. *Helophilus frutetorum* Fabr. of Europe, has even a more prominent tubercle similarly located. In a series of six males, no two have the body markings alike. There is variation also in a series of four females. Loew described a female and a translation of his description is given in Williston's synopsis. The sexes agree in possessing a narrow median pollinose mid-dorsal thoracic stripe, attenuated at both ends and dividing the median black thoracic stripe. From profile view the face is short and very little excavated beneath the antennæ. Specimens from Sandusky, Kent, Columbus and Medina, Ohio; Westville, New Jersey; Winona Lake, Ind.; Lake City, Florida, and Berrien County, Michigan. Loew's type was taken in the District of Columbia.

There is good reason for considering *Helophilus flavifacies* Bigot, a synonym of *divisus*. Bigot's specimen was taken in Maryland, and I have a specimen which answers his description in detail.

*Helophilus integer* Loew.

The male of this species may be known, so far as my specimens show, by the front being entirely bright yellow haired and plainly narrower above than in *divisus*, *laetus* and *obsoletus*, the only species with which it is easily confused. The female corresponds with the male in having very bright yellow thoracic stripes, but the front is extensively black pilose. It is likely a long series of specimens would show much variation in the color markings of legs and abdomen. Specimens from Massachusetts and New Jersey.

*Helophilus obsoletus* Loew.

Both sexes may be known by the obsolete median thoracic stripes and the slender hind femora. Loew described the female and the description is translated by Williston for his synopsis. What I consider the male of *obsoletus* is in the University of

Michigan Museum from Isle Royale. The upper half of the front is black and black pilose. The abdomen is largely black with a widely interrupted yellow band on each of segments two and three and an interrupted gray band on four. Each of segments three and four also have a gray mid-dorsal triangle posteriorly and both of these segments have something of a yellow posterior margin in connection with the triangle; femora black, yellow apically, front tibia yellow basally and blackish on apical half, front tarsi and middle tibiæ and tarsi largely yellow, hind tibiæ black, each with a narrow basal and broader median band yellow, hind tarsi mostly black on superior side and mostly yellow otherwise. I doubt if color markings of legs and abdomen are constant enough in a series of specimens to be dependable for specific distinction. Three females from Whitefish Point, Michigan, collected by McAlpin and Andrews, and a male from Isle Royale extend the known distribution of *obsoletus* much southward for the only published record heretofore gives the species as coming from Fort Resolution, Hudson Bay Territory.

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