REVISION OF THE NEARCTIC SPECIES OF
HELOPHILUS AND ALLIED GENERA

C. H. CURRAN, OTTAWA, CANADA,

AND

C. L. FLUKE, University of Wisconsin, Madison, Wis.

The revision of the genus Helophilus Mg. was originally planned by the junior author who succeeded in bringing together most of the described forms from North America. Owing to increased duties it was found impossible to continue the work and consequently he suggested to the senior author that the material gathered together be forwarded and the revision be carried on by him. The outcome was that a most pleasant and successful co-operation was arranged, enabling us to go into fuller details in regard to the various species than would otherwise have been possible. While the preparation of the manuscript has been frequently delayed, this has been found to have been advantageous, as excellent series of some of the less common forms have come to hand during the past fifteen months.

Types of the majority of the species have been examined, viz: all those described by Loew and Williston, in addition to the species described by Graenicher. Access has not been had to types of Wiedemann, Macquart, Walker, or Bigot, but we have secured in many cases examples from the type localities, thus ensuring almost positive identification. Mr. E. E. Wehr, compared a specimen with Pterallastes perfidiosus Hunter, but we have not been able to find any trace of the type of H. pilosus Hunter. Pterallastes borealis Cole quite evidently belongs near perfidiosus in the genus Lejops.

The collections upon which this paper is chiefly based are those of C. L. Fluke, C. H. Curran (now incorporated in the Canadian National Collection), the University of Wisconsin Collection, Canadian National Collection and that of the late A. L. Lovett. In addition, many other collections have been examined, including the Museum of Comparative Zoology at Cambridge (Loew and Osten Sacken collections); United States
National Museum; American Museum of Natural History, New York; Boston Society of Natural History; Kansas University, Lawrence; University of Minnesota; Cornell University; Royal Ontario Museum, Toronto; R. C. Shannon; Dr. J. Bequaert; and A. L. Melander. These collections contain thousands of specimens and undoubtedly constitute the majority of specimens in North America. In addition, many collectors in various parts of the United States and Canada have submitted specimens for determination. Wherever material permits, Palaearetic species in the Curran collection have been included in the keys and brief notes given.

Owing to the detailed descriptions, it has been found necessary to eliminate a catalogue of the species. Only references to each of the original descriptions and synonyms are given.

Use is made of the terms: posterior ocellar line (a line drawn between the posterior ocelli) and median ocellar line (a line extending from the anterior ocellus to the middle of the posterior ocellar line); as there is a great deal of variation in the lengths of these lines, the differences are often of specific importance.

Dr. James S. Hine’s “Alaskan Species of Diptera of the Genus Helophilus with Notes on Others” (Ohio Journal of Science, XXIII, 192, 1923) is the only large paper published on the genus during the past twenty years. Other recent papers containing records have been published, the three most important being: “Syrphidae of Colorado”, by C. R. Jones, “Syrphidae of Wisconsin”, by C. L. Fluké, and “Syrphidae of Nebraska” by E. E. Wehr. Reference to other papers will be found in the “Syrphidae of Wisconsin”.

It has been deemed advisable to recognize the various genera proposed for the different groups belonging to Helophilus. Shannon, in his revision of the subfamilies, etc., recognized at least four groups. We have recognized practically all the genera previously placed in the synonymy and have found it advisable to establish a few others: only one of these, however, occurs in North America. The habits of the flies in each genus is, for the most part, quite homogeneous and it is felt that the classification is improved by following the course adopted.

It is unfortunate that such well known names as “conostomus Williston” and “similis Maq.” must be relegated to the synonymy, the latter on account of pre-occupation, but it seems
advisable to make the changes at the present time rather than continue the use of invalid names.

**Modified Table to Genera of Helophilini**

| A. Diptera with spurious vein between third and fourth longitudinal veins | Syrphidae |
| B. Anterior cross vein oblique, terminating at or beyond the middle of the discal cell; third vein with a strong, more or less V-shaped, curve into first posterior cell; each femur at the base antero-ventrally with a small patch of black setulae | Eristalinae |
| C. Marginal cell open | Helophilini – 1 |

1. Hind femora at the end with a triangular area before the tip, the base of this with a distinct spur | Merodon |

Hind femora arcuate or plane, not with a triangular projection, if swollen apically the spur is not present |

2. Eyes pilose | 3 |

Eyes bare | 4 |

3. Thorax with pollinose yellow crossbands; pile moderately abundant; not bumble-bee-like (Europe) | Myiatropa |

Thorax at most slightly pollinose, not with distinct bands; pile very dense, largely obscuring ground color; somewhat bumble-bee-like | Mallota |

4. Arista of the male extraordinarily dilated at tip, of female slightly so (Europe) | Platynoecaetus |

Arista simple, bare | 5 |

5. Large species, the thorax thickly yellow or orange pilose; hind femora swollen and arcuate in both sexes; hind tibia without long apical spur; rather bumble-bee-like flies | Mallota |

Generally smaller, the pile not long and dense; if hind femora arcuate the tibiae with long apical spur and coxae with spur; not bumble-bee-like | 6 |

6. Mesonotum densely, evenly yellow pollinose, the ground color nowhere evident; face evenly concave in female; with tubercle, but re-treating below in male; abdomen wholly black | Pterallastes |

Mesonotum not entirely yellow pollinose; if almost so the face is more prominent below in male and female, seldom evenly gently concave, the abdomen not wholly black | 7 |
7. Hind femora of male large, arcuate, abdomen chiefly red; hind femora of female not arcuate, thorax densely pollinose, obscuring ground color; abdomen normally with interrupted greyish yellow pollinose fascia on each segment; face with small tubercle, retreating below; no stigma but stigmal cross-vein present; large species, 14 to 17 mm. — *Polydontomyia*  
Not with all these characters; if doubtful the stigma is twice as long as wide or the size is not over 11 mm. *Helophilus* s. lat.

**Table of Genera of Helophilus S. L.**

1. Face wholly pollinose, without a shining median vitta  
   - Face with a shining median vitta on at least the lower half  
   - Face produced into a long, acute cone (Subgenus of *Lejops*) — *Eurhymia* big., page 273  
   - Face not strongly produced  
2. Eyes of male, contiguous or closely approximated; posterior basitarsi with nodulate pubescence below on at least the basal half (Europe, Asia, Africa) — *Mesembrius* Rond., page 229  
   - Eyes always broadly separated; hind tarsi with normal hairs  
3. Abdomen short, not twice as long as wide; hind tibiae truncate at apex. (Fig. 25) — *Parhelophilus*, page 230  
   - Abdomen elongate, with parallel sides or tapering, over twice as long as wide; hind tibiae produced at apex below. (Fig. 32) — *Lejops* Rond., page 254  
4. Stigma at least twice as long as wide, although often paler apically, not simulating a cross-vein; large species, abdomen broad  
   - Stigma simulating a crossvein (Fig. 22)  
5. Seutellum tuberculate at each side apically (N. Zealand) — *Pilinasica* Mall.  
   - Seutellum not tuberculate  
6. Hind femora with a long, sub-basal spur below (New Zealand), Genotype *Syphrus trilineatus* Fabr.) — *Prohelophilus* new genus  
   - Hind femora without such spur (Palaearctic, Nearctic and Australian Regions) — *Helophilus* Meig. page 211  
7. Front very broad; posterior ocelli remarkably remote; the ocellar triangle very large or very flat; either the front strongly swollen  
8. Front...
below or the face with distinct tubercle; abdomen always broad................. 9

Front moderately broad or rather narrow; never unusually large; face, or the front not as described, though often prominent at middle; face rarely tuberculate, in which ease the ocellar triangle is small.................................................. 10

9. Front remarkably swollen below; genital claspers remarkably long; ocellar triangle of moderate size; bright colored spp. (S. Am.)

\[Dolichogyna\] (Fig. 28)

Front not remarkably swollen, ocellar triangle very large; genital claspers normal; dark colored, except sometimes on abdomen, (North America) (Figs. 11, 12)

\[Asemosyrphus\] Big. page 247

10. Face carinate, more or less retreating (Africa, Asia, E. Indies) \[Mesembrius\]

Face tuberculate in both sexes; small dark colored species with broad abdomen and brassy yellow pile (North America)

\[Lunomyia\] new genus, page 252

**Key to the Species of Helophilus**

1. Face with a median shining black stripe.................. 4

   Face with a median shining yellow or reddish, rarely ferruginous stripe........................................... 2

2. Front of male narrow, wholly black pilose above the depression; of the female wholly black pilose ........................................... \[fasciatus\] Walk.

   Front of male wider, only black pilose on the upper half of the narrowed portion; of the female, broadly yellow haired below.................................................. 3

3. European \[trivittatus\] Fabr.

   American \[latifrons\] Loew

4. Apical fifth of hind femora and basal half of their tibiae reddish yellow; third antennal joint brown.................................................................................. 8

   Hind femora with only the narrow apex or a narrow preapical band reddish and only the basal third of their tibiae yellow.................................................. 5

5. Third antennal joint usually largely reddish; abdomen with three or four pairs of transverse oval spots; hind femora often reddish at base; thoracic vittae irregular.................................... \[obscurus\] Lw.

   Third antennal joint brown or black; never clearly reddish; abdomen variable, not with oval spots, the hind femora never reddish at base; very dark or chiefly pale flies............................................. 6
6. The spots on the third abdominal segment occupy most of the segment; thoracic vittae never interrupted (Europe, N. A.)__hybridus Lw.
   The pale spots on the third segment are not the predominating color, the segment being at least half black and shining; thoracic vittae often interrupted ___________________________ 7

7. The apex of the second segment is black in its entire width or practically so__groenlandicus O. Fabr.
   The apex of the second segment is broadly orange on the sides, so that the whole base of the abdomen to the middle of the third segment is orange laterally__borealis Staeg.

8. Posterior tibia black on the apical two fifths or more; pollinose section of front of male above depression distinctly longer than wide; ocellar triangle equilateral (Europe)__pendulus L.
   Posterior tibia reddish on apical half; yellow on basal half; pollinose section of front above depression wider than long; ocellar triangle decidedly wider than long (Saskatchewan)__intentus n. sp.

**Helophilus groenlandicus O. Fabricius.**

*Tabanus groenlandicus* Fabr., Fauna Groenl., 208, 1780 (Greenland)


?H. androclus Walk., List III, 612, 1849. (Ont.)

Plate V, figures 4, 5

A deep black species, face with black stripe, thoracic vittae narrow; abdomen with three interrupted pale fasciae, the black apical band and second segment entire; the mesonotum usually largely black, pilose on the disc behind the base of the wings.

Length, 11–12 mm. Male. Face black, the sides broadly, yellowish on upper half or more, the middle stripe, oral margin and cheeks shining, elsewhere densely pale yellowish pollinose, the pile rather abundant, whitish; in profile, moderately concave on upper two-fifths, the lower portion with a slight tubercle occupying its upper third, moderately produced below the eyes.

Front with pale yellow pollen, broadly shining above; a subtriangular area immediately above the antennae also shining.
black; pile black, below the groove and slightly above it and at the vertex, yellowish. Occiput greyish pollinose, with yellowish pile. Antennae black, third joint slightly longer than wide, its sides almost parallel, its end obtusely rounded; arista yellowish. Mesonotum rather dull black, the sides more or less densely greyish pollinose; with a pair of widely separated greyish, narrow, usually entire greyish vittae, one on either side of the middle line. Middle portion of pleura lightly pale pollinose. Pile yellow, brighter laterally; behind the root of the wings, but not reaching any margin, sometimes all black, but often this is reduced to a small black pilose area on either side. Scutellum brownish yellow, the base narrowly black, the pile short, black, longer, yellow on the margins.

Legs black, the narrow apices of the femora, basal fourth or fifth of front and hind tibiae and basal half or less of the middle ones, yellow. Pile black, on the basal half of the middle femora behind and on upper surface of hind ones, inner side of front, postero-ventral surface of hind, base and both anterior and posterior surfaces of the middle tibiae, more or less yellow.

Wings pallidly cinereous, the stigma brownish or brownish yellow, the veins very dark. Squamae yellow, with yellowish fringe. Halteres yellow.

Abdomen opaque black, the apices of the second to fourth segments increasingly widely shining black, the last mentioned half shining, the side margins also shining. First segment lightly greyish pollinose. Second segment with large yellow triangles, not reaching the hind border, their posterior margin a little oblique, the posterior corners usually rounded off slightly, the anterior inner corners usually rather acute, their anterior surface a little concave, the spots reaching the base of the segment broadly at the sides. Third segment with a large basal, sub-rectangular spot occupying two-thirds the length of the segment and extending inwards to occupy one-third the width, the inner ends produced more behind and with a greyish, slightly oblique interior prolongation, the inner ends moderately separated. Fourth segment with a pair of oblique, slightly lunulate, narrowly separated greyish pollinose spots on the front half, their outer ends near the middle of the segment, both ends rounded. Pile short, yellowish, longer laterally, on the posterior half of the second to fifth segments, black, but not reaching the sides. Genitalia almost all pale haired.
Female. Front moderately wide, slightly narrowing above, pale yellowish pollinose but less thickly so on the middle portion, ocellar region bare; pile black except at vertex and a few hairs on the sides below. Legs a little more extensively pale.

Abdomen somewhat more extensively shining, the spots on the second segment narrower, especially the inner arms; only the small corners of the third segment orange, a pair of transverse, very slightly luminate spots, narrowly separated in the middle, separated from the front margin by less than their width, greyish white pollinose, lying wholly before the middle of the segment. Fourth segment not reddish on basal corners, the pollinose fascia similar to that on preceding segment, less widely separated from base, and not reaching the side margins; fifth segment with similar fascia. The black pile on posterior half of the segments reaches the side margins.

Redescribed from a male, Loew Collection; 2 male, 2 female, Hopedale, Labrador; male, Peaceful Valley, Colo.; female, Lake Opasatika, Que. Over one hundred specimens from Pingree Park, Colorado, 1924.

A very distinct species because the black of the hind margin of the second segment reaches the sides in both sexes. There is considerable variation in the amount of black pile on the posterior part of the thorax and it may be all wanting.

**Helophilus borealis** Staeger

*H. borealis* Staeger, Kroyer’s Tidskrift, n. ser., I, 359, 1845. (Greenland)


*H. bruesi* Graenicher, Bull. Wis. Soc. VIII, 40, 1910, (Wis.)


Allied to *groenlandicus*, but the abdomen is all yellowish pilose except a small apical triangle on each segment, sometimes wanting on second and third.

Length, 12–13. 5 mm. Male. A middle stripe, narrow oral margin and cheeks shining black, the face elsewhere yellowish red and densely yellow pollinose, the pile palidly yellowish. Face in profile moderately concave on upper two-fifths, its lower portion slightly receding and a little convex, two-fifths of the
face lying below the lower border of the eye. Front with parallel sides above the depression, moderately wide, but the upper portion decidedly longer than wide; before the suture with whitish yellow pollen, but it becomes yellow or even brownish yellow on the upper portion of this part and is brownish yellow on the upper part, practically bare across the ocelli; a broad shining black arch immediately above the antennae; pile yellow on lower portion, on lower part of upper portion and at vertex, elsewhere black. Occiput greyish yellow pollinose, with yellowish pile which becomes almost whitish below. Antennae black, the third joint velvety brown, irregularly circular, not oval, slightly broader than long, the arista twice as long as antenna, tapering, ferruginous.

Mesonotum rather dull blackish, the sides aeneous or thinly greyish pollinose, with a pair of broadly separated longitudinal almost whitish, slender stripes, widest anteriorly and often scarcely evident on posterior half; in some specimens practically wanting, in others reaching the scutellum and slightly broadened behind.

Pleura thinly greyish yellow pollinose. Scutellum yellow, the narrow base blackish. Thorax wholly greyish yellow pilose, or with some black pile in front of the scutellum, the latter yellow pilose.

Legs black, the apices of the femora, basal third or less, of front and half to two-thirds of the middle tibiae, yellow. Pile on femora black, yellow behind the front four and on dorsal surface of hind ones; on tibiae mostly yellow on front four, only of this color on front side of hind ones, elsewhere black.

Wings almost hyaline, very slightly cinerous. Stigma yellowish brown. Squamae whitish yellow, with yellowish pubescence and white fringe. Halteres yellow.

Abdomen over half shining greenish black, the second segment except the apex, basal half of the third and a small basal spot on the middle of the fourth, more or less opaque, scarcely so in some specimens, the second and third segments with yellow spots, the third and fourth each with a pair of greyish pollinose, transverse spots. The sides of the second segment are wholly rather broadly yellow, expanding to form a large triangle, the two thus formed being broadly separated in the middle, slightly concave in front, slightly convex behind, their posterior inner ends rounded, so that the front end is acute, the posterior mar-
gin of the spot oblique; the black on the posterior margin usually extends over half way from the middle line to the side margin, sometimes, two-thirds the distance. Third segment with a small rectangular orange spot on anterior angles, and, on each side of the middle line with a slightly oblique, elongate oval greyish pollinose, spot, the inner ends of the two moderately separated. Fourth segment with a pair of similar spots which are, however, less widely separated, a little more oblique, and slightly narrower. The abdominal pile is all pale, except a small apical black pilose triangle on the apex of the fourth segment, which may be enlarged, in which case the third segment bears a triangle. Genitalia all pale behind.

**Female.** Agrees closely with the male; the only conspicuous difference is found in the abdominal pile. Second segment with a narrow apical fascia of black pile on the median half, the third with a wider one broadly separated from the lateral margins; fourth segment with the incomplete black haired fascia angularly produced forward in the middle, the fifth with a large apical triangle of black pile almost reaching the base. The extent of the black pile is somewhat variable.

**Male.** Greenland (von Moschler); from the Loew Collection; specimens were compared with the type. Over 100 specimens from Alaska, Labrador, all Canadian provinces, New England States, N. Y., Wis., Minn., Idaho, Ore., Colorado, and Washington. This species was not recognized by Williston, but he described one of the darker, more shining specimens as *H. daeckeii* on material from Alaska, the type of which was examined.

*Helophilus latifrons* Loew.

*H. latifrons* Loew, Cent. IV, 73, 1863 (Nebr.).

*H. trivittatus* Auct. (N. America).

Plate V, figures 7, 8.

Second and third abdominal segments chiefly lemon yellow in male, rather variable in female; face with the middle line always yellow or reddish yellow, never ferruginous or black; front of male only black pilose across ocelli, of female yellow pilose on lower third.

Length, 11 to 15 mm. **Male.** Face yellow, densely whitish pollinose, the middle line on the lower two-thirds or more, broad-
ly shining; narrow oral margin and cheeks shining black; pile white. Face in profile deeply concave on upper two-fifths; the lower three-fifths more prominent above, sometimes sub-tuberculate, retreating. Front black, yellow just above the antennae; before depression whitish yellow pollinose, above it yellow pollinose, shining black across ocelli and vertex, above the antennae with a rather large shining triangle which may be all yellow or largely brownish, its upper portion forming a slender arm not reaching the depression. Pile yellow, black across the ocelli. Occiput greyish pollinose, more yellow above, with the orbits above narrowly shining. Pile yellow. Antennae black, third joint chiefly reddish, but brown above and apically; sometimes chiefly so; scarcely longer than broad; arista yellow.

Mesonotum opaque black, the lateral margin and a moderately wide, broadly separated sub-median vittae yellow or greyish yellow, the latter joined to the former in front. Pleura whitish or greyish pollinose. Scutellum translucent yellow, the corners only black. Pile of thorax all yellow, except on the disc of the scutellum where it is black.

Front four femora on basal half or less, the hind ones except the apex which also bears a black spot, black. Front four tibiae and middle tarsi all yellow; the front tibiae more or less distinctly brownish on apical fifth, the last three joints of the middle tarsi fuscous; front and hind tarsi black; hind tibiae yellow on basal third, elsewhere black. Pile all yellow, the hind femora with short black, bristly hair below and longer bristles on apical half, and in addition several long black or yellowish hairs. Hind tibiae a little produced apically on inner side, arcuate; their femora rather evenly convex below, except basally.

Wings eimerous hyaline or with slight yellowish tinge, the veins yellow basally; stigma yellow. Squamae whitish or pale yellowish, with yellow border and fringe; the lower lobe strongly pubescent above. Halteres pale yellow.

First abdominal segment black, its sides very broadly pale yellow, wholly thinly greyish pollinose. Second segment pale yellow, the base on the middle two-thirds, its hing margin oblique, and rather broadly connected in the middle with a rather narrow subapical band, opaque black; the middle connection usually narrowest anteriorly always widened behind, the posterior fascia widest at middle, slightly but distinctly narrowed to the sides, usually very narrowly separated from the lateral margin; very
narrow hind margin reddish, preceded by a narrow shining black fascia. Third segment similar in color, usually with an oval, anteriorly transverse, sometimes with a more elongate, basal spot on the middle fourth, moderately broadly connected with the broad apical fascia, sub-opaque black, often chiefly shining, but the median connection is usually almost all pollinose so the yellow appears to extend entirely across the middle of the segment, the black posterior fascia is biconvex, reaching forward in the middle, and more or less so laterally, but the sides opposite and posterior margin are narrowly reddish. The fourth segment has only the narrow, lateral and apical margins reddish, but there may be a slight broadening of the reddish towards the front; on the anterior half is a rather broad, anteriorly and posteriorly biconcave greyish to yellowish fascia, which is narrowed towards the middle and almost reaches the base at this point in some specimens, spreading more or less along the margin posteriorly. Pile yellow, short, on the apices of the second and third segments, reaching the sides, moderately broadly black; on the fourth segment not reaching the sides, all black behind the fascia.

Female. Abdominal markings usually very different from male except in newly emerged specimens as they very often turn blackish in large part. Face usually slightly less concave; front broadly or narrowly black pilose across the ocelli and a little before them; whitish pollinose on sides below, less thickly so on the broad middle line, the pollen here and above more yellowish, the black shining color as in male.

Abdominal segments shorter, the black more extensive; the anterior curved fascia of the succeeding segment is narrower, the yellow only a little more than half as wide in the middle in most specimens, the posterior fascia slightly wider and less narrowed laterally. Usually the basal black fascia on the third segment extends three fourths across, but, sometimes as in the male, the posterior fascia is wider, occupying almost one-third of the length of the segment: this leaves the yellow as a narrowly interrupted basal, broad fascia, concave on the front border towards the middle, connected at the middle by yellow pollen. Fascia on fourth segment as in male, fifth segment similar but the fascia reaching the base on broad middle portion. Apices of second and following segments broadly black pilose, reaching the sides on only the second, and sometimes the third segment. In almost all the darkened specimens the outlines of the yellow
areas are usually quite evident as outlined above, but there is a strong inclination to narrow the spots so that the black predominates, the yellow or orange color forming lunulate, usually complete fasciae on the second and third segments; these lunules very seldom interrupted in the middle.

Described from numerous specimens from all parts of the United States and Canada, April to October.

*Helophilus latifrons* shares with *H. fasciatus* the distinction of being the most common species in America. Its range extends even into South America where it has been recorded by various European entomologists as *H. trivittatus*. While the two species bear a most remarkable resemblance in almost all respects they are quite distinct. *H. latifrons* is not quite as large as *trivittatus*, the average length being three millimeters less; the face is distinctly less concave below; the antennae are lighter in color, the third segment of *trivittatus* is black or almost so in all the specimens we have examined; the female is not almost evenly pollinose, but is more shining except on the sides, the fascia on the third segment is scarcely indented by a black triangle, while there is a large triangle in *trivittatus* and the same applies to the following fasciae but the last fascia is interrupted or practically so in that species, always entire in *latifrons* and the last two fasciae are more transverse in the latter. In the male the lunules on the fourth segment are larger and much more oblique, and are narrowly interrupted or sub-interrupted in *trivittatus* and the front femora are over half black. The distinctions between the two species may not appear great from the above, but examination reveals other slight differences and they appear quite distinct when seen together.

There is really no question of synonymy in connection with this species, except that it has been recorded as *trivittatus* from Central and South America.

While we have seen many specimens from Mexico, which are the present species, we have not seen a single *trivittatus* and therefore feel certain that all references to the European species from America are erroneous.

*Helophilus trivittatus* Fabricius

_Eristalis trivittatus_ Fabricius, Antl., 235, 1805 (Europe).

*Musca parallelius* Harris, Expos. Engl. Ins., 57, Pl. XV, f. 8 (1776) (Europe).

Plate V, figure 3.

Extremely like \textit{H. latifrons} Loew. The differences between these two species have been dealt with under \textit{latifrons} and need not be repeated. No specimens have been found in America so far as we know, although the species has been frequently recorded. Its range extends over all Europe and most of Asia. The senior author found it commonly in England and Northern France near suitable breeding places. Verrall includes \textit{H. latifrons} Loew as a synonym but in this he was wrong.

\textit{Helophilus fasciatus} Walker

\textit{H. similis} Macquart, Dipt. Exot., II, (2), 64, 1842. (Ga.) nee Curtis.

\textit{H. fasciatus} Walker. List III, 605, 1849 (Ont.).

\textit{Eristalis decissus} Walker, List III, 614, 1849. (Ont.)

\textit{H. sussurans} Jaennicke, Neue Exot. Dipt., 94, 1867. (III.)

Plate V, figure 6

Allied to \textit{H. latifrons} but the abdominal bands are narrower; the front is much narrower and the black pile occupies all the front above the depression in the male and all the front in the female. The legs are more extensively black.

Length, 10 to 15 mm. \textit{Male}. Face yellow, thickly yellow pollinose, the middle line broadly shining reddish yellow to ferruginous but never black, the oral margin and cheeks shining black; pile pale yellowish; in profile concave on upper three-fifths, convex below this, the lower two-thirds convex reeding, without distinct tubercle although the formation approaches one. Front narrowed above the upper portion nearly twice as long as wide, except on the upper fifth yellow pollinose, the pollen paler on the sides before the depression and often somewhat reddish in the middle and above; immediately above the antennae reddish, the polished triangle chiefly blackish. Occiput yellow to greyish pollinose; with yellow pile. Front black pilose above the suture, yellow below it except sometimes several hairs immediately above the antennae. Antennae reddish, sometimes more or less ferruginous, the third joint brownish above and apically; arista reddish.
Mesonotum opaque (or sub-opaque black, in old specimens), the side margins and broadly separated sub-dorsal stripes opaque yellow or pale greyish, more or less narrowed towards the posterior margin, but sometimes the middle ones a little broadened here, the pale vitae not joined in front. Pleura yellowish grey pollinose. Scutellum translucent yellowish, the very narrow base and the corners black or brown. Pile of thorax all yellow, short, on the disc of the scutellum black.

Femora black, the apical third or less of the front four and the apex of the hind ones reddish yellow; middle tibiae wholly, front ones except the apical third, hind ones on basal third or less and the first two joints of the middle tarsi, yellowish or reddish, the legs elsewhere black. Hind femora moderately broadened, widest at apical third, below with dense black short, coarse hairs and with fine bristles on apical half, and a few long black or yellow hairs, the pile all yellow elsewhere.

Wings cinereous hyaline often quite yellowish anteriorly basad of tip of first vein. Stigma luteous. Squamae whitish, with pale yellow border and yellow fringe, with short pale yellowish pubescence on the lower lobe above. Halteres yellow.

Abdomen opaque black, with large yellow spots on the second and third segments, the fourth segment fasciate with pollen. First segment greyish pollinose except behind the corner of the scutellum the sides broadly yellow. Second segment chiefly yellow the black forming a rather broad basal facia which is almost as long as the width of the thorax, broadly connected on the middle line with the moderately broad posterior margin, the apex shining, the immediate apex narrowly reddish on middle part; the posterior fascia is of almost equal width but is slightly widened at middle and sides but reaches or is very narrowly separated from the lateral margin. Third segment yellow on basal two-thirds with an oval black spot in the middle at the base, connected in almost its full width with the black posterior border, but, in well preserved specimens more or less broadly pollinose on the connection so that the anterior spot appears isolated; the posterior margin is moderately broadly shining, the apex reddish, or sometimes the shining portion is all reddish. The yellow is biconvex behind so the black reaches forwards at the sides, and usually attains the lateral margin. Fourth segment with the narrow lateral margin and rather broad apex reddish or obscurely so, sub-basally with an abbreviated, almost trans-
verse yellow or greyish pollinose, sub-basal fascia, its anterior margin gently concave on either side, narrowed in the middle, so that its posterior margin is somewhat oblique on either side. Pile yellow, short; shorter and stouter on each segment behind the fasciae and reaching the sides on all but the last.

Female. Abdominal fasciae narrower, the front all black pilose. Front narrowed above, yellowish pollinose, the middle line darker and with thin brownish red or yellowish pollen.

Abdominal segments shorter. The black basal fascia on the second segment extends slightly more towards the sides and is quite as wide as the thorax, the yellow spots are sharper inwardly, seldom obtusely rounded as in male. The fascia on the third segment occupies but little over half the width of the segment. The pollinose fascia on the fourth segment is narrower, but slightly narrowed in the middle, its outward posterior portion convex so that each side appears slightly lunulate. The fascia on the fifth segment reaches the base on its middle portion or is narrowly separated laterally, increasingly so towards the margin; it is slightly widened laterally; the segmental margin is yellow as in the preceding. The pollen is always yellow in this sex.

This species is probably more abundant than *latifrons* in most parts of North America, but seems to be a little more northern in distribution even though it extends into Mexico. It is also an earlier appearing insect in most localities and is common on bloom.

*Helophilus fasciatus* is readily distinguished from its close ally, *H. latifrons*, by its much narrower front in the male and wholly black pilose front in female and also in this sex by the yellow pollinose abdominal fasciae, the male differing less in this respect. The legs are more extensively black. It is a rather variable appearing species, but we are unable to find any differences between the small specimens with grey pollinose fascia and the large ones with yellow, and, notwithstanding the different appearance, a careful analysis shows the distinctions are more apparent than real. *Helophilus pendulus* and *hybrida* have a strong black middle fascial line.

It is with regret that we are forced to change the name of this species, which is so well known as *H. similis* Macq., to that used by Walker, but it is quite evident that Macquart’s name cannot be used. As pointed out by Williston, the name *similis* already
existed for a British species, which was later however referred to *H. pendulus* L. There is not the slightest excuse for retaining Macquart’s name, as might have been done had Curtis’ species been placed in another genus, although even this practice appears to be poor policy. The fact remains that we still have a name *similis* for a species in this genus, even though it be a synonym. From the descriptions both *Eristalis decissus* Walker and *H. susurrans* Jaenniche appear to be undoubtedly this species.

**Helophillus pendulus** Linne

This European species is readily distinguished from *fasciatus*, which it resembles in many respects, by its deep black, shining facial stripe, black basal antennal joints, still more blackish femora, except the hind ones, more reddish posterior tibiae, and always isolated yellow spots and fasciae, as they are all interrupted in the middle. The black facial stripe distinguishes it also from *latifrons*, and the much narrower abdominal yellow spots, and much more extensively reddish hind tibiae separate it from *hybridus*.

Hine, in his recent article, recorded this species from Alaska, but an examination of his specimens, which he so kindly sent us, show them to be *intentus* n. sp.

**Helophillus intentus** new species

Plate V, figures 9, 10

Allied to *H. pendulus* L. but the hind tibiae are wholly reddish, the frontal projection weaker, front wider, the upper pollinose section being wider than long instead of distinctly longer than wide, etc.

Length, 10 to 11 mm. Male. Face yellow, the broad median stripe, oral margin and cheeks black, the cheeks in front and median vitta shining although the latter is thinly greyish pollinose above. Face with yellowish white pollen, which has a slight brassy reflection: in profile the lower two-thirds almost perpendicular (a slight indication of tubercular swelling above), the upper third rather evenly concave. Frontal prominence with a shining full V-shaped area above, the upper fourth subshining black, the balance ochreous pollinose. Upper section of
front three-fifths as wide as long, and one-half as wide as one eye measured at the middle; ocellar triangle twice as wide as long, very short. Face with almost white pile; front on lower half, or slightly less, yellow pilose, the upper half with black pile. Ocellar yellow pollinose above, greyish pollen on the lower two-thirds and cheeks; pile yellow above, white below; no black occipital cilia. Antennae shining black; the third joint reddish, but broadly reddish brown above, sub-orbicular, a little longer than wide; arista reddish.

Mesonotum opaque black, the broad lateral margins and moderately broad submedian vittae bright yellow, or slightly greyish at ends, the latter pair tapering slightly but again broadened before the scutellum. Pile thick, yellow, becoming white on the lower portion of the pleura; scutellum translucent reddish luteous with narrow black base and much coarser black pile than on the pleura, the immediate margin with pale hairs.

Coaxe black, grey pollinose, whitish pilose, the pile of the front pair very short. Femora black; a little more than the apical fourth of the front and hind pairs and apical third of the middle ones, reddish; tibiae reddish, paler basally; anterior pair broadly brownish at apex, the hind ones with ferruginous tinge on sides of apical third, tarsi black, the middle basitar-sus reddish. Pile of legs yellowish; black on the upper surface of the tarsi; the narrow anterior lower edge of the middle femora except basally, and beneath the hind femora, where the hairs are short, rather bristly, and some black, fine spines towards the outer end.

Wings strongly tinged with cinereous or even somewhat luteous on basal half or more in front. Squamae whitish, with yellow border and fringe; halteres pale yellow.

First abdominal segment black, grey pollinose, the lower side pieces pale yellow; second segment opaque black with the narrow apex shining black; on each side with a large pale yellow triangle reaching base and apex broadly, more or less obtusely rounded in the middle and moderately widely separated from each other; they cover more than half the segment; apex of segment narrowly reddish except the sides; yellow triangles covered with yellow pollen. Third segment with a large, basal, reddish or orange spot on either side, reaching four-fifths the distance to the apex and moderately broadly connected with the narrow reddish apex at the sides, their inner end oblique so that their inner
posterior end is broadly rounded but is covered by yellow pollen which projects inwards and forwards; posterior margin of the spots a little oblique; spots yellow pollinose; narrow preapical fascia shining black; short basal fascia, median vitta and short fascia behind the spots, opaque black. Fourth segment with the narrow lateral margin and broader apex shining reddish yellow, the segment elsewhere shining except for the broad, ochreous pollinose lunules, which are narrowly bordered with opaque black, rounded inwardly and the inner ends somewhat nearer the base than the outer ends. Pile black on the black areas, except: the first segment, base of second, lateral margings of fourth, increasing in width behind, and the lower margins of the second and third segments which are otherwise black pilose behind the middle of the second segment. Pile on pale areas pale yellow; on the genitalia dense, long, yellow.

**Female.** This is very similar to the femal of *pendulus* but the wholly pale posterior tibiae will separate it.

**Holotype.** Male, Farewell Creek, S. Saskatchewan, Sept. 1907, No. 2224 in the Canadian National Collection, Ottawa; **allotype**—female, Savonaski, Naknek Lake, Alaska, July, 1919, (J. S. Hine); in Hine Collection.


This species has very much the habitus of *H. pendulus* L. but the differences pointed out are sufficiently striking to warrant its separation. It might be confused with *H. obscurus* Lw. but that species lacks the sharp points to the spots on the third segment and those on the fourth are only slightly lunulate, much broader and not oblique.

**Helophilus hybridus** Loew

Plate VI, figure 11


Face with median black stripe; pale markings very extensive on second and third segments of abdomen; in the female much less extensive, those on third segment sharply rounded on inner ends.
Length, 13 to 15 mm. Male. Face yellow pollinose, a large triangle on the cheeks, narrow oral margin, broad median stripe, supra-antennal triangle and upper third of front shining black; facial vitta with pollen on upper fourth. Front and back of head bright yellow pollinose. Pile yellowish; on the cheeks and lower orbits white; on upper third or less of the front, (except the vertex) black. Face prominent below, convex on a little more than the lower half, the concavity however occupying more than the upper half. Antennae black; arista red. Ocellar triangle wider than long, moderately large.

Mesonotum opaque black, the wide lateral vittae and moderately wide dorso-central vittae, yellow pollinose; pleura with greyish yellow pollen. Pile of thorax luteous. Scutellum translucent brownish yellow, darker at base and sides, black pilose except on base and apical margin.

Legs black; broad apices of the anterior four femora, basal third of the front, whole of the middle tibiae, basal fourth of the hind pair and whole of middle basitarsi, reddish yellow; posterior femora with preapical reddish band which is broadly interrupted postero-dorsally. Femora black haired above and below, the bases usually more or less broadly pale haired; the tarsi and under side of hind tibiae also with black hairs; legs elsewhere with yellowish hair.

Wings eimereous hyaline. Squamae whitish with bright yellow border and pubescence and yellow fringe. Halterers yellow.

Abdomen with three pairs of reddish yellow spots or the last pair yellowish grey pollinose. First segment shining black with the sides broadly yellow. Second segment chiefly dull reddish yellow, with the apex reddish on at least the median half and opaque black markings as follows: a broad median vitta which narrows slightly behind where it is connected with a rather narrow subapical fascia which never extends to the lateral margins except rarely as a ferruginous stripe, the median vitta expanded so as to be slightly wider than the black of the mesonotum. Third segment with the apex reddish preceded by a shining black fascia which usually reaches the lateral margins, and an opaque black median vitta which narrows rather sharply to the basal fourth of the segment where it connects with a transverse basal spot which is hardly three times as long as wide and more or less rounded on its outer ends posteriorly; the yellow ground is supplemented by some greyish white
pollen so that the pale spots are rather acute inwardly at their middle; pale spots occupying three-fourths or slightly more of the segment at the sides. Fourth segment shining black, with a very narrow, incomplete basal sub-opaque black fascia which is usually narrowly connected with a median opaque black triangle lying between the inner end of the large yellowish grey or greyish yellow pollinose spots which occupy more than the basal half of the segment sub-laterally, are convexly narrowed inwardly and slightly arcuate in front; posterior margin and narrow lateral margin reddish. Genitalia ferruginous. First two segments yellow pilose except the broad posterior margin of the second and the side margins on the posterior half; posterior third of third segment (except the pale spots) and the whole of the lateral margin at base, black pilose; fourth segment with the shining black area and apex black-haired; pile of abdomen elsewhere pale yellowish. Second and third ventral segments usually all yellowish.

**Female.** Front with a band of yellowish pollen in front of the ocelli interrupting a median black vitta; front black pilose in the middle below and on upper half except the vertex.

Abdominal markings much as in *obscurus* but the spots are larger, being more truncate inwardly on the second segment, more acute on the third and not at all oval on the remaining segments, but transverse, narrow and narrowly separated from each other.

Specimens are before us from Northern Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and the Northwest Territories. Other localities include Nova Scotia, Minnesota and North Dakota.

The male is readily distinguished by the very large pale abdominal markings. The female resembles *obscurus* much more than would be expected and is probably most easily separated by the wholly pale third ventral segment, this being largely shining black in *obscurus*, but the abdominal fasciae are quite different in shape upon close examination. The irregular median vittae of *obscurus* also readily separates the two species. European specimens from England and Denmark do not differ.
Helophilus obscurus Loew
Plate V, figures 1, 2

H. obscurus Loew, Cent. IV, 74, 1863. (Colo.)

Face with median black stripe; abdomen of male with 3 pairs of, of female 4, transverse, more or less oval spots, the first pair large and somewhat triangular, the last pair slightly lunulate in male.

Length 10 to 13.5 mm. Male. Face orange yellow, the middle line reaching almost to the antennae, oral margin and cheeks, shining black. Yellow portions of face and front to well above the suture densely yellow pollinose, the pollen on the face usually pale. Face moderately excavated on upper two-thirds, slightly retreating on lower portion. Front narrow above, on the upper half or more of the narrow portion, except the venter, black pilose, elsewhere with yellow pile. Occiput yellow pollinose on about the upper half, the lower half with greyish yellow pollen and white hair. Antennae black, the third joint largely or almost wholly red, the upper and apical margins brown. Arista orange yellow.

Mesonotum deep, black, only sub-shining in some lights, the side margins and a pair of broadly separated, sub-median vittae, yellow or pale yellow, the latter narrowed behind the suture, sometimes interrupted on the suture, usually as before the scutellum, but there are always two wider spots just before the scutellum, and when the vittae are entire they widen behind. Pleura greyish yellow pollinose. Scutellum translucent brownish, its apex reddish; thorax yellow pilose, the scutellum with short, abundant black pile except on its margins.

Legs black. Apices of front four femora, basal third to half of the front tibiae, all the middle tibiae, their apices sometimes slightly darker and the first two joints of the middle tarsi yellow or reddish yellow; hind femora sometimes with their bases, a rather narrow sub-apical band, the basal third of the hind tibiae and sometimes a narrow median band yellow or reddish.

Wings hyaline or tinged with yellow. Stigma brownish. Squamae pale yellow, with yellow fringe. Halteres pale yellow.

Abdomen opaque black, the narrow apex of the second, apex of third and broad apex of fourth segments, shining; with two pair of yellow pollinose spots. Sides of first segment pale yellow;
second segment yellow, except the broad apex, broad median stripe and base, the black on the latter rather rounded laterally and broadly separated from side margins. Base of third segment with a rather broad, sub-oval spot on either side, more widely separated in the middle in front, widely so behind, their posterior margin convex, the spots narrower laterally; at their inner ends posteriorly with a small spot of yellow pollen. Fourth segment with a yellow pollinose broad, slightly lunulate spot on either side sub-basally, their outer ends separated from the front and lateral margins, their inner ends separated from each other by about half the distance between the inner ends of the preceding spots. Apices of segments successively more widely, more or less evidently, reddish. Pile black; yellow in front of the hind margin of the yellow markings on each segment and on the sides of the fourth segment. Genitalia usually black; reddish in only one specimen.

Female. Front somewhat narrowed above; black pilose only on the upper half, rarely almost to the antennae, the middle line thinly pollinose, and appearing black; pollen on face and front yellowish white.

Thoracic vittae slightly wider, and rarely interrupted.

Abdomen more shining, the yellow spots narrower, more transverse, those on the third segment only reaching the sides in front. Pollinose fasciae on fourth segment more oval, scarcely concave in front, not lunulate; the basal corners of the fifth segment with transverse, pollinose, triangles, narrowly separated in the middle.

Over 100 specimens from New York, Quebec, Ontario, Manitoba, Alberta, British Columbia, Idaho, Wisconsin and Colorado.

The reddish third antennal joint, and three pairs of interrupted fasciae at once distinguish this species from all others known to us.

**Mesembrius Rond**

Plate VII, figure 40

The genus Mesembrius does not occur within our range, but is confined to the Old World, being especially abundant in Africa and Asia. It is characterized by the carinate face and the contiguous or narrowly separated eyes in the males and the
stigma simulates a cross-vein. Superficially the species included in this genus display the greatest resemblance to Helophillus, but the nature of the stigma forms a ready means of separation.

We are unable to state the number of species which should be included under the genus, as many species described under Helophillus really belong here. Bezzi lists thirteen species from the Ethiopian region, some of which also occur in Asia, and one species is recorded from Europe. It is probable that most of the species of Helophillus listed from Southern Asia and the East Indian Islands belong here.

Another character, which seems to be constant, which may be used to distinguish this genus from all others examined is the presence beneath the hind tarsi of numerous nodulate hairs. Sometimes these hairs are found only at the basal fifth, at other times more than half the tarsal pad is composed of them. In the nine species of Mesembrinus which we have examined this character is very well marked and quite easily seen, while we have found no trace of it in any other genera.

Parhelophilus

Girschner, Illust. Wachenschr., II, 604, 1897

The genus Parhelophilus shows greater affinities to Helophilus than do most of the allied genera previously included under the latter. The abdomen is shorter and more compact, the stigma simulating a cross-vein. The apical production of the hind tibiae is absent, thus readily distinguishing the genus from Lejops. The ocellar triangle, while very broad, is seldom almost equilateral and is always comparatively much smaller than in Asemosyrphus. Genotype, Helophilus fructorum Fabr.

Parhelophilus was not well understood by its founder and could not possibly stand upon the characters used by Girschner. The genus was separated from Helophilus because of slight differences in the squamae, but as these intergrade to a greater or less degree it is evident that the character is of little value. Lejops lunulatus was also included in the genus by Girschner, but as that species has the hind tibiae produced, it is quite evident that it cannot belong here. Considered in every way, this is a very compact, homogeneous group and it seems that the isolation of the species into a distinct genus is very desirable.
Table of Species—Males

1. Hind femora with a sub-basal projection below, which may be broader than long and is beset with black setulae. 2
   Hind femora at most somewhat rounded sub-basally. 3

2. Femoral process long, bearing an apical fan-like fringe of black hairs (Europe). *frutetorum* Fabr.
   Femoral process short, covered with shorter, black setulae. *divisus* Loew

3. Abdomen deep black, with three pairs of hoary spots, the ground color reddish only beneath part of the spots on the second segment. *porcus* Walk.
   Abdomen with yellow ground color on second and third segments, the spots never hoary. 4

4. Mesonotum without distinct vittae; hind femora somewhat arcuate. *obsoletus* Loew
   Mesonotum distinctly vittate; hind femora not arcuate. 5

5. Large dark species, with 3 pairs of widely separated yellow abdominal spots; unusually narrow front and the basal two-fifths of hind femora yellow. *anniae* Brim
   Species of usual size; if with three pairs of broadly separated abdominal spots, the posterior femora are wholly black; front of male wider. 6

6. Posterior basitarsus with black pile above, the hairs mostly as long or slightly longer than the height of the segment bearing them. *integer* Lw.
   Posterior basitarsus with appressed short yellow hair above. 7

7. Apical third or more of anterior tibiae black; posterior basitarsus usually with five or six short, black bristles on apical half of lower anterior surface. *rex* n. sp.
   Anterior tibiae wholly yellow or at the most ferruginous on apical fourth; bristles on hind basitarsus, if present, reddish, rarely one or two black. 8

8. Front broadly black pilose immediately above the antennae; the orange color occupies all the sides of the second and third abdominal segments (Europe). *versicolor* Fabr.
   Front with only a few black hairs above the antennae; posterior black bands of second and third segments entire. *laetus* Loew
Females

1. Abdomen black with hoary pollinose spots..._porcus_ Walk
   Abdomen not with hoary spots...2
2. Abdomen opaque black with whitish yellow
   spots or fasciae..._rex._ n. sp.
   Abdomen with reddish yellow or orange mark-
   ings, the pale color predominating...3
3. Mesonotum without distinct vittae..._obsoletus_ Loew
   Mesonotum with distinct vittae...4
4. Face scarcely convex almost straight, slightly
   produced below..._divisus_ Loew
   Face distinctly concave above, prominent on
   lower half...5
5. Hind femora all yellow below...6
   Hind femora largely black below; near their
   base with long process (Europe)..._frutetorum_ Fabr.
6. Hind femora broadly yellow below on only
   lower surface (Europe)..._versicolor_ Fabr.
   Hind femora with an anterior and posterior
   black spot, sometimes joined above (N. America)...7
7. Face but little prominent below..._lacteus_ Loew
   Face quite strongly prominent on lower part..._integer_ Loew

_Parhelophilus_ porcus Walker

Plate VI, figures 18, 19

_Helophilus_ porcus Walker, Cat. British Dipt. Part III, 551,
1849 (Can.)

Readily recognized by the deep black abdomen with hoary
segmental spots.

Length 9 to 11 mm. _Female._ Face yellow, thickly wholly
pale yellowish pollinose, narrow oral margin and the cheeks
shining brown or blackish. Pile pale, sparse, long. In profile
conceave above, almost perpendicular below, but still slightly
receding, the lower part very slightly convex, strongly produced
downwards, rather obtusely conical, the lower portion of the
face scarcely less produced than the antennal prominence.
Front wide, the sides subparallel, slightly narrowed above the
middle, but again slightly widened to the posterior angles of
the eyes, which are rounded off. Front shining black in ground
color on the lower third, except the reddish supra-antennal W.
densely covered with greyish or greyish yellow pollen, which is
always darker on its upper margin; pile black abundant,
moderately long. Ocellar triangle very broad, the median ocellar line scarcely longer than half the posterior ocellar line. Occiput shining black, the orbits broadly greyish pollinose. Pile black on upper half, longest above, short whitish or yellowish on lower half. Antennae ferruginous reddish, third joint sub-orbicular; arista concolorous, long, thickened on basal half.

Mesonotum densely grey pollinose, shining laterally behind the base of the wings; in front on the basal three-fifths with a median, geminate black stripe, slightly divergent posteriorly, a short median stripe just before the scutellum and a sub-lateral stripe not quite reaching either end, opaque black. Pleura black, moderately greyish pollinose, but not entirely obscuring the ground color. Pile on the mesonotum before the suture, less widely so in the middle, and on the pleura except the mesopleura, pale yellowish; elsewhere, black. Scutellum translucent reddish, its base and sides black; pile black, on the sides pale yellowish.

Legs black, immediate apices of front four femora, narrow bases of their tibiae and sometimes of the hind ones, and first joint of their tarsi, yellow; all the tibiae with a rather narrow yellow median reddish band; front four tarsi brown, their last joint reddish. Hind femora greatly swollen, somewhat laterally compressed, their tibiae arcuate; front legs slender. Coxae pale haired, the front four with a dense apical ciliation of black hair. Front four femora with black above, with pale pile below; hind femora with shorter, pale pile and black stouter hairs below; tibiae with brownish and brownish yellow short, appressed pile, front tarsi wholly pale, the others chiefly black haired.

Wings cinereous hyaline, stigmal spot brown. Squamae white, with white fringe. Halteres reddish yellow.

Abdomen opaque black, the side margins shining, narrow posterior margin of second to fourth segment, broadened in the middle, on the last two, triangularly, shining black with a greyish sheen, owing to thin grey pollen; the same segments each bearing a roundedly rectangular, transverse spot on either side, these successively nearer the base of the segment, the front ones wider laterally, and more narrowed inwardly, all the spots widely separated, less widely so from the lateral margin. The first segment is all hoary except a roundish lateral opaque black spot; the fifth has a narrow longitudinal basal triangle opaque
black, the lateral margins broadly, the apical narrowly shining black, elsewhere greyish. Pile whitish basally, on the hoary spots and side margins opposite and the fifth segment except the middle basally.

Male. Front strongly widened posteriorly, where it is practically twice as wide as at narrowest point; yellowish grey pollinose below the depression; with very scattered greyish pollen in front of the ocelli except at the sides; pile wholly black.

Thorax with a wider black triangle immediately before the middle of the scutellum, the black median vitta only interrupted on its posterior half by the narrow grey line, and narrowly separated from the posterior black triangle. Legs deeper black, the pale markings on the tibiae reduced.

Outer half of the hoary spots on second abdominal segment situated upon reddish ground, the lateral margin shining black, the reddish tinge carried broadly obliquely outward to almost reach the margin broadly behind the basal incisure. Lateral margins shining black opposite the spots on third segment and extending quite to the base; fourth segment more broadly shining laterally. The hoary spots are a little smaller, being less elongate.

Female, Montreal, Que., June, 15, 1906; Female, Banff, Alta., July 4, 1922, (C. B. D. Garrett); Male, Gimli, Man., June 13, 1928, (A. J. Hunter). We have seen specimens from McDiarmid, Ontario, near the type locality; New York, and New England States.

The male was received after the description had been completed in other respects.

**Parhelophilus rex** new species

Plate VI, figures 15, 16

Belongs to *laetus* group, but much darker, the pale thoracic stripes narrow; opaque black, the abdomen with three pairs of yellow spots.

Length, 10 to 11 mm. Male. Face translucent yellowish, densely pale yellowish pollinose, the middle line below and the oral margin broadly shining; narrow oral margin and cheeks, shining black; in profile upper third moderately deeply concave, the lower half slightly receding, scarcely convex, not as promi-
nent as the antennal prominence, only moderately produced below the eyes and therefore obtuse; pile rather long, sparse, yellowish. Front narrowest at lower third, where there is a distinct transverse depression, distinctly widened to the posterior angle of the eyes; lower third yellowish, obscurely blackish above, but wholly yellowish pollinose. Above moderately shining black. Pile yellow before the suture, thick, black above. Ocellar triangle line to outer ocellus greater than the distance between the anterior ocellus and that line. Occiput shining black with a greyish bloom, the orbital margin broadly grey pollinose. Pile yellow, rather long above, the cilia black; on the lower three-fifths short, white, becoming longer and more yellow below and on the cheeks. Antennae reddish; third joint broader than long, obliquely truncate apically, longer below; arista brownish, long, tapering, slightly thickened on basal fourth.

Mesonotum opaque or sub-opaque black, with five greyish vittae, the median one slender, slightly widened posteriorly but fading out at about the posterior third; on either side of the middle line, not quite half way to the lateral strip, is a rather narrow, slightly irregular complete stripe of the same color, which is characteristically broadened inwardly before the scutellum as a long apical triangle, lateral margins broadly of the same color, but subshining, as the pollen is evidently less abundant, the stripe broadening anteriorly and spreading over the humeri to reach the sublateral stripe obscurely. The three median stripes are narrowly bordered by a deeper black. Pleura black with thin pollen of same color as on sides of mesonotum. Pile of thorax tawny or bright reddish yellow; on the pleura less abundant. Scutellum translucent reddish, the base broadly blackish; pile black, on the narrow base and apex yellowish.

Femora black, their apices broadly reddish, on the hind ones with a subapical more or less complete band; hind tibiae with the narrow base yellowish, a reddish band at the middle; front and hind tibiae with narrow base and apex yellow, the subbasal fourth on outside posteriorly black or blackish, so that apical fourth wholly and the sub-basal fourth on outside posterior black or blackish, so that there appears to be a reddish median band from some views, but the larger portion of the tibiae is reddish. Hind tarsi blackish, the front four reddish with somewhat darker apices. Pile of femora yellowish black on front four posteriorly on apical half or less; similar but all ap-
pressed on tibiae and tarsi, but black on exterior surface of the front four tibiae.

Wings cinereous hyaline or faintly yellowish about the middle. Squamae white, with pale yellow border and white fringe. Halteres pale yellow.

Abdomen opaque black; with three pairs of spots and other yellow markings; first segment, the hind margins of the following segments, triangularly expanded in the middle on the third and fourth, and the narrow lateral margins, shining. First segment with an obscure yellow spot in front sublaterally. Second segment with very large lateral sub-triangular spots, occupying the lateral margin on the anterior half, thence cut off by a narrow black triangle, their posterior edge slightly oblique and slightly convex, their inner ends rounded, the anterior inner edge concave, reaching the base of the segment broadly, moderately separated from the posterior margin at sides, and broadly separated in the middle, pale yellow; the inner corners of the spots are situated at the middle of the segment, and some whitish pollen projects slightly onto the black. The spots on the third segment are somewhat similar in shape, but are narrowly separated from or just reach the side margins, are much shorter, occupying about two-thirds the length of the segment, their inner anterior margin not concave, the posterior corners of the spot supplemented by a white pollinose projection which is transversely oval in shape, making the inner ends of the spots appear acute. Posterior margin of the segment yellow on lateral sixth; in the middle with a greyish yellow pollinose triangle. Fourth segment with the posterior margin yellow, the sides and large basal triangles, moderately separated, gray or greyish yellow pollinose, the inner ends of the triangles cut off from the base of the segment by a black triangle; a small yellowish pollinose triangle in the middle apically. Pile black; on the side margins and on the yellow spots, whitish or pale yellow.

**Female.** Face less sharply concave above, the lower portion more rounded and scarcely receding; pile blackish. Front wide, the sides sub-parallel, slightly widened below; pile all black.

Thorax with black pilose band between the wings, not reaching sides.

Legs more piceous than black, the hind tarsi brownish above, yellowish below.
Abdominal spots more rounded inwardly the first pair convex posteriorly, the spots on the two following segments more transverse, narrower as they occupy only the basal half of the segment and are more rounded inwardly.

The third segment is not yellow posteriorly, but together with the fourth, is narrowly reddish. Fifth segment greyish yellow or yellow pollinose, with a basal, longitudinal median triangle, black or brown.


Type in Canadian National Collection. No. 2223.

This species is very much darker than usual in general appearance and has only narrow pale thoracic vittae. It is readily distinguished from the *groenlandicus* group of *Helophilus* by the small stigma.

*Parhelophilus anniae* Brimley

*Helophilus anniae* Brimley, Ent. News XXXIV: 278, 1923 (N. Car.)

"Face, antennae, arista, and lower part of front light yellow, the latter with yellow pile, narrower portion of front (between the eyes above) dark brown with dark pile. Thorax with two narrow submedian yellow stripes and a somewhat broader one on each side, scutellum paler than thorax. Legs: front and middle femora dark brown for about basal two-thirds, yellow at apex, front and middle tibiae and tarsi mainly yellow, hind femora yellow on basal third, then abruptly black to apex, hind tibiae and tarsi black. Abdomen: second, third and fourth segments each with a pair of yellow spots, these wider externally, and narrower internally, those of each pair widely separated, those of second and fourth segments broadly reaching the sides of those segments, those of third segment nearly or quite separated from the side of the segment by the ground color, a small yellow spot on the apex of fourth segment. Length about 11 mm.

"A female taken at Aberdeen, North Carolina, May 10, 1922 . . . appears to be the same species, the only differences being that it is slightly larger, the submedian stripes on the thorax
are a trifle wider, there is no apical yellow spot on the fourth segment, and the pile on the front above the antennae is largely black, instead of yellow.

"This species looks somewhat like a small *H. similis*, but differs from all species I know or could find descriptions of, in the following combination of characters,—wholly yellow face, antennae, and arista; three pairs of widely separated yellow spots on abdomen, and in the hind femora being yellow at base, and black in middle and apex." Brimley.

This species evidently belongs to the genus Parhelophilus, although we may be mistaken in this. Dr. Aldrich in a letter states that "the hind femora is yellow on the basal two-fifths and provided with a distinct swelling bearing a cluster of black spinules at the point where the tip of the tibia comes in contact with it. In this respect it resembles *frutetorum*, an European species.

Since the above was written, the type has been examined. The species is very distinct from any yet described, being nearest related to *P. rex* from which it differs in the narrower, almost parallel-sided upper part of front, larger size, etc.

*Parhelophilus divisus* Loew

Plate VII, figure 25

*Helophilus divisus* Loew, Cent. IV, 78, 1863. (D. C.)

Allied to *lactus* but the face is not at all convex and not prominent below the middle, the abdominal spots transverse and smaller.

Length, 9 to 11 mm. *Male*. Face reddish yellow, yellow pollinose, the narrow oral border and cheeks shining black to light brownish; in profile shortly receding below the antennae, thence slightly produced to the tip of the oral margin, almost straight, only slightly produced below the eyes. Pile rather long, yellowish. Front black or brownish, wholly brownish grey or greyish yellow pollinose, less thickly so at vertex; sides parallel on upper half, somewhat divergent below, the median depression distinct and with a slightly anterior bow. Pile all black or sometimes yellow before the depression. Ocellar triangle very broad, the lateral half of the posterior ocellar line one and one-half as long as the median ocellar line, the lateral
ocelli separated from the eyes by little more than their own width. Occuput grey pollinose, yellowish above, the pile yellow on upper half, white and shorter below. Antennae red, third joint large, slightly wider than long, sub-orbicular, the lower corner longer; arista brownish, tapering.

Mesonotum opaque greyish yellow or yellowish grey, more greyish in old specimens, with three opaque black stripes, the median one geminate on anterior two-thirds, narrowed somewhat on posterior third, the dividing line usually very slender, the lateral black stripes about half as wide as the median one, all the stripes not quite reaching the front, but the median reaching the posterior margin, the lateral narrowly separated from it. Pleura grey pollinose. Pile bright yellow. Scutellum reddish yellow, the base and sides black. Pile black, on the margin, longer, yellow; sometimes all yellow.

Femora black, the apical third of the front four and fourth of the hind ones, reddish, the latter black at the apex above, or the hind ones may be all reddish; front four tibiae and tarsi, except a black spot behind, extending to the anterior margin above in the middle, reddish yellow, the apices of the front tibiae and the last two joints of the front four tarsi brownish. Hind tibiae on apical fourth, their tarsi wholly, and an obscure sub-basal band brown or brownish. All the femora may bear an obscure reddish spot below basally. Hind femora somewhat thickened at the base below with a rounded, large tubercular swelling bearing abundant short black setulae.

Wings cinereous hyaline, the stigmal spot small, brown. Squamae whitish with yellow border and fringe. Halteres yellow.

Abdomen opaque black; the fourth segment chiefly grey pollinose; with yellow spots on second and third segments. Second segment with the sides broadly reddish yellow on the anterior two-thirds, expanded inwardly on the middle of the segment as a broad, inwardly rounded projection, its anterior edge concave towards the side, posterior margin slightly convex, the spots medi- anly separated by the length of one of the arms. Third segment with its outer end produced forward to the anterior angles, and touching the base of the segment broadly; narrow lateral margin of the third and forth segments and the narrow apices of the second to fourth segments yellow. Fourth segment greyish yellow pollinose except a median transverse fascia occupying
half the width of the segment, a basal, apically convex fascia occupying one-third the width and a connecting middle stripe. First segment wholly grey pollinose except a roundish black spot on either side; posterior margin of the second segment more broadly in the middle, of the third still more broadly and more angularly in the middle, grey pollinose. Pile yellow, black on the incomplete posterior margins of the second to fourth segments, successively more broadly so. Ventral plates black with yellow apices, the sides of the second broadly yellow.

Female. Front moderately narrowed above, its sides parallel on upper third. Pile less abundant, black. Pile on thorax all shorter.

Front femora with only an incomplete broad brownish basal band behind, their tibiae obscure brownish apically; last two joints of front four tarsi as in male. Middle femora with small, brownish sub-basal patch behind. Hind femora with a broad, incomplete, brownish band about the middle or a little beyond, on postero-dorsal surface produced apicad; sub-basal brownish band on hind tibiae complete.

Abdomen broader, the yellow spots narrower, more elongate, the second pair lunulate, their sides more parallel; fourth segment with narrower black fasciae, the basal one extremely narrow. Fifth segment with a very small black basal triangle, otherwise grey pollinose.


H. divisus may be distinguished from all species except porcus and rex by possessing on the antero-ventral surface of the posterior basitarus a row of short black bristles. As these bristles are confined to the apical half in rex, that species is eliminated, while porcus has hoary abdominal markings and wholly black hair on the upper surface of the posterior tarsi.

Parhelophilus frutetorum Fabr.

Plate VI, figure 14

Most nearly allied to P. divisus Loew, but the process on the hind femora is nearly twice as long and is strongly fringed with
a fan-like row of moderately long, black hairs, the posterior femora are all black or brown except the apex, the usual spot above the apex. Face slightly more convex below; yellow thoracic vittae narrower, more yellow. Front black pilose above.

The female is similar to the male except in abdominal markings and absence of the femoral process. The inner half of the lunule on third segment is formed by a pair of oval, transverse pale yellow pollinose spots, rather narrowly separated.

These characters are sufficient to show the relationship of the two species and also the chief differences between them. In addition the posterior tarsi lack the row of short black bristles on the anteroventral surface of the basitarsi, thus agreeing with all other species in the group (except \textit{divisus}, \textit{porcus} and \textit{replinio} which lack the bristles on the basal half of the posterior basitarsus.

Specimens—male, Germany; male, female, Denmark. \textit{P. frutetorum} is not known from North America.

\textit{Parhelophilus laetus} Loew

Plate VI, figures 20, 21, 22

\textit{Helophilus laetus} Loew, Cent. IV, 77, 1863. (N. Y.)

Hind tibiae not produced on inner apex; abdomen chiefly reddish yellow; thoracic vittae usually rather broad, slightly divergent on anterior third, lower portion of face rather prominent and shorter than the concave upper part.

Length, 8.5 to 10 mm. \textit{Male}. Face yellowish, thickly yellow pollinose except the cheeks in front and the broad oral margin to the tip; cheeks black on posterior two-thirds; in profile the face is deeply concave on more than the upper half, the lower portion prominent and gently convex, retreating below. Front yellow before the suture, thickly yellow pollinose; above, blackish, but thickly yellow pollinose, less thickly so across the ocelli. Ocellar triangle much broader than long, the median ocellar line about equal in length to the lateral half of the posterior ocellar line. Occiput blackish, wholly greyish or yellowish pollinose. Plie of head all yellow except a broad black band between the ocelli and depression. Antennae orange colored, the arista black apically.
Mesonotum dull olivaceous black, with the side margins broadly and sub-median, moderately narrow, stripes yellowish or greyish yellow pollinose, all connected along the anterior slope by a transverse band of pollen, which is wider laterally, so that the lateral black fasciae are more widely separated from the front margin than the middle one. The middle yellow stripes are very slightly bowed outwardly and are usually slightly broadened anteriorly, and posteriorly and narrowly connected behind to the lateral stripes. Pleura grey or yellowish pollinose. Scutellum yellow or reddish yellow, the base narrowly and the angles, black. Pile of thorax bright yellow, the disk of the scutellum with black pile.

Legs reddish yellow, with black markings. Front four femora with the basal third or fourth black, rarely with the markings almost obsolete; hind femora with a broad median black band, interrupted below, sometimes greatly reduced and leaving only a small spot in front and a large one behind; also with a small spot at apex above. Hind tibiae with sub-basal and apical rather broad black bands, usually the middle half yellow, but this sometimes reduced to one-third; hind tarsi wholly black. Pile all yellowish.

Wings cinereous hyaline or slightly yellowish tinged. Squamae white, with yellow border and yellowish white fringe. Halteres yellow.

First abdominal segment grey pollinose except behind the anterior corners, usually broadly yellow laterally, sometimes but little so. Second segment opaque black, the apex narrowly reddish; the sides broadly, expanded as a large triangle occupying more than half the segment, its inner ends rather truncate or broadly rounded, posterior margin slightly oblique, the anterior oblique and concave on its middle portion; the yellow is rather narrowly separated from the reddish hind margin and the black emits a triangle forward along the margins for a short distance. The black on the third segment is limited to a basal transverse fascia on the middle half, a narrow, almost complete sub-apical fascia, usually moderately broadly jointed to the anterior one in the middle and emitting a small triangle forward laterally. Sometimes the middle connection is obsolete and the basal fascia narrow and not convex posteriorly. Following segment with almost similar markings but the posterior fascia does not reach nearly to the laterally margin and is not or scarcely broadened.
laterally. The yellow between the fasciae is often wholly due to greyish yellow pollen; in pale specimens the basal fascia and middle connection may be obsolete, in which case the pollen is yellow. Genitalia with yellow or yellowish grey pollen, apices of last two segments and often the narrow lateral margins, reddish. Sternites black, the apices yellow pollinose. Pile of abdomen yellow, black on apices of segments.

**Female.** Very similar but still more reddish or orange. Front wholly black pilose, more or less yellow in ground color above the antennae, yellow pollinose as in male.

Mesonotal pale vittae slightly wider. Legs showing same variation.

Abdominal segments shorter so that the yellow fasciae are narrower and the black lateral projections of the fasciae usually extend much further forward, sometimes quite to the base of the segment. The black may be obsolete in the same way as in the male. Fifth segment black, the lateral margin and posterior margin, much more broadly in the middle, yellow, the whole covered with yellow or greyish yellow pollen except a median longitudinal basal dash.

This description is drawn from over fifty specimens from the northern States and Canada as far West as Manitoba and Wisconsin. The range extends over practically all the United States and Canada east of the Rockies.

*Parhelophilus versicolor* Fabr.

Plate VI, figure 17

Perhaps nearest *P. integer* Loew but the posterior femora sub-basally on the antero-ventral surface is somewhat roundedly swollen and bears a tuft of rather conspicuous long yellow pile, the face is scarcely less prominent below, the front is black pilose above and again just above the antennae and the yellow of the second and third abdominal segments reaches broadly to the hind margin.

These differences are well marked and constant in the male. The female has a wider front, as in *laetus*, but the posterior femora are black on the basal half except below, the face is much less prominent, and the black posterior segmental fasciae straighter.

Specimens: male, female, Denmark; male, Europe.
*Parhelophilus integer* Loew

Plate VI, figure 23

*Helophilus integer* Loew, Cent. IV, 76, 1863. (N. Y.)

Allied to *laetus* but the front of the male is narrower and wholly yellow pilose; the face is less deeply concave and less prominent in both sexes; the cerci of the hypopygium are short and obtuse.

Length, 9 to 10 mm. *Male.* Face yellow, translucent, densely yellow pollinose; the cheeks in front and posterior part of oral margin shining; checks black behind a point a little before the suture. Face in profile slightly concave above, gently convex below, but little prominent on lower half. Front yellow, above the suture brownish, densely yellow pollinose even above, though the ground color shows through in the region of the vertex. Middle ocellar line longer than the lateral half of the posterior ocellar line. Occiput greyish or greyish yellow pollinose. Whole head yellow pilose. Antennae orange; arista black on apical half.

Mesonotum densely yellow pollinose, appearing more greyish in old specimens, with broad median and slightly narrower sublateral opaque blackish stripes, the lateral ones narrowly separated from the posterior, widely so from the anterior margin, slightly narrowed at the ends, but still rounded, the median one entire, but thinly pollinose on the anterior slopes. Pleura yellowish pollinose. Pile all bright yellow. Scutellum yellow, dull, the base black; pile black, yellow on margin.

Legs yellow, the basal fourth or less of the anterior four femora, sometimes only faintly so, a broad median band interrupted below, on the hind femora, sometimes all but base and broad apical band; a spot above the apex, the apical third and broad basal band of their tibiae and their tarsi wholly, black or brown. Hind femora only moderately swollen, with black bristles below on apical half. Pile of legs all yellow.

Wings cinereous hyaline. Squamae whitish, yellowish on apical portion, the fringe yellow. Halterers yellow.

Abdomen predominatingly yellow or reddish yellow; opaque black, the first segment grey pollinose except behind the anterior angles, the sides more or less yellow. Second segment reddish yellow, with a large lunulate black basal fascia not reaching the sides, and broadly connected with an entire, narrow, sub-apical
opaque black fascia which projects slightly forwards at the sides, behind this a shining black fascia with a triangular median projection forward, the immediate apex narrowly reddish; the apex in the middle with a greyish yellow pollinose spot. The yellow is cut off slightly obliquely at the sides, the inner arms broadly separated, rather truncate, the anterior margin oblique, concave about its middle. Black on third segment limited to a rather narrow, subtriangular basal fascia on middle half or more, connected to a sub-apical opaque fascia situated before a narrow shining band, the apex narrowly reddish and greyish yellow pollinose, the pollen triangularly produced in the middle, the lateral margins black on apical third. Fourth segment very similar, the pale markings composed of greyish yellow or yellow pollen, the spots narrower, very narrowly separated, the posterior black fascia occupies only three-fifths the width of the segment, its arms slightly enlarged, side margins broadly, the apical margin widely greyish yellow pollinose. Genitalia with similar pollen. Sternites black, their sides more or less broadly and apices narrowly, yellow. Pile yellow, rather short, black on apices of segments.

**Female.** The female is difficult to distinguish from *laetus*, but the face is only slightly concave above and much less projecting below; the front narrower and appearing longer, the hind femora are almost straight on their lower surface, not distinctly convex, and the fifth abdominal segment is nearly half black pilose, not all yellow.


*H. integer* was originally described from New York, and has never been authentically recorded since, except from the New England States. It is very limited in its range, but probably will be found in all the New England and adjacent states. *H. laetus* has a wide distribution, but apparently does not occur in New England.
Parhelophilus obsoletus Loew

Plate VI, figure 24

Helophilus obsoletus Loew, Cent. IV, 75, 1863 (Hud. B. Terr.).

Allied to integer but the thorax is not vittate.

Length 9 to 10 mm. Male. Face transluscent yellow, covered, except the very broad oral margin, and cheeks, with pale yellow pollen, cheeks brownish black, the oral margin yellow before the jowls, in profile moderately concave on about the upper half, the lower half moderately prominent. Front yellow before the suture, densely yellowish pollinose; above the suture black, densely yellow pollinose, except just at the vertex, where it is thinly so. Ocellar triangle wider than long, the lateral ocelli narrowly separated from the eyes, the median ocellar line as long as the distance from its base to the orbit. Occiput olivaceous blackish with greyish yellow pollen. Pile of head wholly yellow. Antennae orange yellow, arista concolorous; third joint elliptical.

Mesonotum rather dull olivaceous blackish, broad submedian and broad lateral margins, diffusely slightly more shining or very lightly yellowish. Pleura greyish pollinose. Scutellum impure yellowish, rather dull, only the corner blackish. Pile of thorax yellow, only on the disc of the scutellum black.

Anterior four femora black, on basal half, the hind ones black except the apical third; anterior four tibiae and tarsi wholly yellow; the hind ones black, with the bases and a broad median band yellow. Hind femora with a black dorsal spot just before apex. Pile wholly yellow. Hind femora only moderately enlarged, slightly areuate.

Wings cinerous hyaline or slightly yellowish. Stigmal spot yellow. Squamae whitish, the border yellow, fringe yellowish white. Halteres yellow.

First abdominal segment sub-opaque black, the sides and anterior angles grey pollinose. Second segment opaque black, the apex shining and narrowly reddish; the sides except the apex broadly yellow, expanded as large obtuse triangles occupying nearly half the length of the segment near their inner end, situated chiefly beyond the middle, their posterior margin slightly oblique, the anterior concave on the middle portion. Base of
third segment with an incomplete, medianly broader and an incomplete subapical transverse fascia, these narrowly connected on the middle line, opaque black, elsewhere reddish yellow. Fourth segment with a median stripe, expanded, as basal fascia, and a median incomplete transverse fascia, brownish red, elsewhere reddish, the sub-basal yellow pollinose fascia incomplete and narrowly interrupted. Pile yellowish; broadly black on apices of segments, the black not reaching the sides on the last segment. Stermites black.

Female not before us. Loew’s description shows only the following variations: base of scutellum black; thoraeic stripes very narrow, yellow; each segment with a triangular spot in middle contiguous to the yellow apex; femora less extensively black, on the front four reduced to two basal spots; the hind ones with a large black spot behind.


The male specimen described here was compared with the type and is undoubtedly the same species. The presence of vittae on the thorax of the female is to be expected, but they are extremely faint in the type, as in the male. The nearest ally is integer which also has a yellow haired front but differs in having wide thoraeic vittae. The median ocellar line is much longer in comparison to the posterior ocellar line than in laetus. The two allied European species are more closely related than laetus but both have the upper half of front black haired.

**Unrecognized Species**


Hine has suggested that this is the same as H. divisus Loew. It seems likely that it is either divisus Loew or anniae Brimley but it is not possible to decide from the description. The type is in the collection of Mr. J. E. Collin, Newmarket, England.

**Asemosyrphus** Macq.


Giglio-Tos, Ditteri del Messico, II, 18, 1893.

Distinguished from allied genera by the remarkably large, ocellar triangle, more or less tuberculate face, non-pollinose
thorax and usually broad, flattish abdomen. The stigma simulates a crossvein, the hind femora are swollen, and slightly compressed. The front in both sexes is wide, the head flattened above and somewhat triangular.

Three species are accepted as belonging to this genus but it is possible that \textit{bicolor} is a synonym of \textit{mexicanus}. The material before us does not permit of an opinion on the matter.

\textit{Key to species of Asemosyrphus}

1. Hind tibiae wholly reddish yellow (Mexico) \textit{bicolor} Big.
   Hind tibiae largely black---------------------------------- 2

2. Face obtusely short conical; abdomen reddish or with grey lunules; mesonotum olivaceous, with three germinate opaque black vittae-\textit{mexicanus} Macq.
   Face produced as long acute cone; abdomen without grey lunules, all black; mesonotum almost unicolorous (canadensis Curr.) \textit{willingi} Smith

\textit{Asemosyrphus mexicanus} Macq.

Plate VI, figure 13


Mesonotum olivaceous, with six slender opaque stripes, the median ones joined to the inner ones of the lateral two; abdomen partly reddish or with grey lunules.

Length, 9 to 10.5 mm. \textit{Male}. Variable, the following description from a single specimen will cover all parts except the abdomen. Face wider than either eye, the middle line, a broad stripe on the cheeks, and narrow oral margin, shining black, elsewhere densely greyish yellow pollinose; in profile, perpendicular, the large, elongate tubercle occupying nearly half the face, above it, moderately concave. Front wide, the sides slightly divergent above, but sub-parallel, slightly convex laterally on upper portion, covered with slightly more greyish pollen than
the face; a shining spot immediately above the antennae, the vertex broadly less thickly pollinose, the pile yellow, black just above the depression. Ocellar triangle very large, the posterior ocelli near the posterior angles of the eyes. Occiput densely pale greyish pollinose, yellow pilose. Antennae piceous, the third joint black, sub-circular, a little longer below; arista reddish.

Mesonotum shining olivaceous with a median and sub-lateral, moderately broad, geminate opaque black stripes, the lateral ones abbreviated anteriorly the median one extending to the posterior third; the middle ones connected with the inner lateral stripe by a sub-rectangular spot on apical third, and joined to a narrow median line which runs from the apex of the abbreviated stripe to the scutellum; the outer line of the lateral stripe is triangularly broadened just before and behind the suture and there is a slender, oblique straight line rising at the posterior end of the lateral stripe and running in a line towards the humeri but it does not reach the suture. Pile of thorax yellowish. Pleura bluish black. Scutellum more or less yellowish or reddish, the base blackish, its pile all pale.

Legs black; narrow apices of femora and bases of tibiae yellowish, the pile all yellowish. Hind femora greatly swollen; largest in the middle, more or less laterally compressed, their tibiae rather evenly arcuate.

Wings cinereous hyaline, more cinereous anteriorly. Squamae greyish white with yellow border and fringe. Halteres yellow.

Abdomen variable; in the specimen before us as follows: first segment shining black, with a greyish sheen, an opaque black spot laterally, the sides yellow on posterior half. Second and following segments reddish, with obscure darker areas, the second with a broad basal opaque black fascia, its posterior margin rounded, but produced in the middle as a rounded triangle which does not quite reach the posterior margin and is not as long from its base as its width; sometimes this black projection expands almost to the lateral margin on the apical part. The third segment is much similar but the dark markings are greyish red, leaving basal, more reddish, slightly lunule-forming orange spots on either side, the segment wholly shining; these triangles are overlaid with a slender whitish or yellowish lunule, rising at the anterior angle, extending obliquely towards the middle of the segment and curving somewhat forward at their inner ends which are broadly separated. The base of the fourth
segment has a brownish opaque arch on either side of the middle line, and almost completely engaging its posterior border, a narrow, yellowish white lunule, the brown opaque color continued as a more reddish opaque band across the base of the segment, the lunules widely separated; behind the lunules shining ferruginous. Pile short, rather appressed, yellowish, longer on sides basally, the posterior half of the second and third segments, not reaching the sides and excepting the narrow hind margin, and dark basal spots on fourth segment, with short, appressed black pile.

**Female.** Front wide, slightly narrowed towards the middle, the sides almost parallel on upper portion; usually the black pile is limited to a transverse spot on either side just above the middle.

The abdomen is usually all black, all shining, more or less sub-opaque on second segment and bases of the two following, with four pairs of grey lunules, the first pair slightly oblique, extending inwards from behind the middle of the grey lateral triangles which reach the base moderately broadly; the lunules on the two following segments similar to male; the fifth segment bears broader, shorter lunules than the fourth, and the side margins are narrowly pollinose. Pile as in male, the fifth segment with all pale pile. The sides of the second segment are often yellowish-red except behind.

Four specimens from California. Numerous specimens have been examined. It is a common species in Mexico and has been reported as far north as British Columbia.

*Asemosyrphus mexicanus* is very distinct from *A. willingi* which has a sharply conical face and lacks abdominal lunules and thoracic stripes.

*Asemosyrphus willingi* Smith

Plate VI, figure 12


Face produced downwards and slightly forwards into a long cone; whole fly black, mostly shining; ocelli very widely separated.

Length 9 to 10 mm. **Male.** Face and front shining black, the sides of the face obscured by whitish yellow pollen, leaving a
median stripe and the cheeks shining; front broadly covered with similar pollen on the lower half, except an arch above the antennae. Lower half of the face produced as in Helophilus conostomus Will., but produced only a little forward, with a long, slender, not prominent tubercle below the middle, above which it is shallowly concave, and below which it is almost straight to the tip of the oral margin; antennal prominence narrowly reddish above the antennae. Antennae shining black, tip of second joint and immediate base of third somewhat reddish; third joint opaque, whitish pubescent, subquadrate, slightly broader than long and slightly shorter than the second joint, but longer than the first; arista bare, long, slender tapering. Posterior orbits yellowish gray pollinose. Pile: on the face limited to the sides, fine and whitish, cheeks bare; front with pale yellow pile, but with a black band across the anterior ocellus; posterior orbits with whitish pile below and yellowish above.

Dorsum of thorax shining blackish green; a moderately wide opaque black, median stripe not quite reaching the scutellum and which usually has a very slender shining stripe in its middle; on each side of this a shining stripe, obsolete before the posterior quarter, wider than the median opaque stripe; on the outer side of this is a broad, opaque black, stripe, which is expanded on the posterior quarter to join the median opaque stripe, is partly interrupted at the suture, and encloses a more or less distinct narrow shining stripe; near the sides is a very narrow opaque stripe on the posterior two-thirds, interrupted at the suture. The shining stripes appear to have a greyish tint in some lights. Pleura and scutellum shining blackish green, with pile of a paler yellowish color than that on the dorsum.

Legs shining greenish black, tips of all the femora and narrow bases of tibiae reddish (in one specimen the bases of the tibiae are more broadly yellowish and there is also a yellowish band just before the middle); hind femora considerably enlarged, the greatest swelling near the middle; hind tibiae arcuate, not ending in a spur; all the tarsi golden pubescent beneath.

Wings a little infuscated; veins reddish, but brownish apically, basal portion of 2-3 longitudinal vein with about seven bristles of a blackish or reddish brown color. Squamae pure whitish with white pile; halteres brown yellow.
Abdomen shining greenish black with a metallic reflection in some lights, the first segment slightly grayish; second segment with a large basal opaque black triangle, broadly separated from the lateral margin and apex; third segment with a small opaque roundish or oval spot before its middle, sometimes obsolete; abdomen elsewhere shining; no lighter markings. Pile of the abdomen pale yellowish, but across the disc on the posterior half of each segment with shorter black pile.

Specimens examined: 4 male, Saskatchewan, July 1907.

This species is very distinct from the only other species in the genus reported from Canada, *A. mexicanus* Macq., and is readily recognized by the absence of light abdominal markings and the conically produced face.

**Lunomyia** new genus.

**Plate VII, figure 27**

Allied to Lejops, but the face is distinctly tuberculate in both sexes. Small dark species the abdomen not at all yellow, nor marked with pale, the thorax with a greyish yellow vittae. Third antennal joint broader than long, its apex almost evenly, gently convex. Front moderately wide in male, the sides parallel above, in female slightly narrowed above, the ocellar triangle small. Legs as in Asemosyrphus. Stigma simulating a crossvein. Vein- ation as in Lejops. Genotype: *Helophilus cooleyi*, Seamans.

**Lunomyia cooleyi** Seamans

**Plate VII, figures 26, 27**


Resembles an Asemosyrphus, but the ocellar triangle is small. Length, 7 to 8 mm. Male. Face black in ground color, except a reddish spot on either side of the slopes below; densely covered with yellow dust which leaves a moderately narrow, dorsally abbreviated median stripe, the oral margin and a broad stripe on the cheeks shining black or brownish; pile brassy yellow, limited to the sides below, and appearing as a conspicuous tuft; the side margin below and the cheeks with similar but
slightly shorter pile. In profile the face is a little prominent below as the concavity of the upper half is deeper than that below the long, rounded tubercle. Front almost one-fourth the width of the head, with a deep depression just below the middle and with a broad, less evident depression extending from it in the middle to the apex of the antennal prominence, before the depression densely yellow pollinose, above it rather dull black, with a little yellowish pollen below on the middle portion and along the whole orbits in some lights. Pile all black except at vertex. Ocellar tubercle swollen, convex, the triangle a little broader than long, not large. Occiput greyish pollinose, with yellow pile. Antennae brownish black, with thin pale pollen, the arista black, thickened and tapering on basal fourth.

Mesonotum dull black, the sides shining aeneous greyish, anteriorly yellowish greyish pollinose, with two widely separated, complete moderately slender vittae of the same color rising at the inner ends of the pollen on the front surface, and widening behind to join the lateral shining portion; these vittae are very thinly pollinose and are, except in fresh specimens very largely shining. In addition there is a slender median line of the same color on the anterior three-fourths. Pleura black, thinly grey pollinose. Scutellum blackish, translueent brownish red apically. Pile of thorax rather conspicuous, all brassy yellow.

Legs black or brown, with brassy yellow pile, apices of the femora, bases of the tibiae, a moderate band on their middle, incomplete on the front ones, yellow. Hind femora wide, somewhat laterally compressed, widest at apical fourth, their tibiae arcuate, with a short, broad, apical lobe.

Wings cinereous, the small, stigmal spot luteous. Squamae white, with pale yellow border and white fringe. Halteres yellowish white.

Abdomen shining greenish black, somewhat piceous on basal angles of second segment. Second segment opaque black except the broad sides, which expand somewhat towards the front, and the narrow hind margin. Third segment with a medianly expanded opaque basal band on middle half. Pile all brassy yellow, longer laterally and on the metallic triangles on the second segment.

Female. Facial tubercle sharper, more acute, the part of the face not prominent below the tubercle, but on a plane with the upper concavity which is rather more angular. Front broader,
its sides a little narrowed above, but distinctly diverging behind the ocelli, the depression broad, with a rather large transverse swelling on either side of a broad median foeva just above the antennae, the pollen apparently not so abundant, the swellings bare.

The front and middle tibiae show no indication of a pale median band.

Abdomen as in male but the third segment is only narrowly opaque at the base on the middle third and the metallic color is more extensive on the second segment as it forms a broadly interrupted, broad median fascia the inner ends of the spots rounded and the hind margin of the segment more broadly shining. Fifth segment wholly aenous.

This description is drawn from a pair of paratypes of Tropidea cooleyi Seamans, from Bozeman, Montana, June 12 and 20, 1906. Specimens of this were compared with the type of Helophilus modestus Williston and are absolutely identical in all respects.

**Lejops Rondani**


The characters of this genus are: apex of hind tibiae produced as a scoop-like or rather acute spur; stigmal spot simulating a crossevein; ocellar triangle rather small; front of female not as wide as one eye, of male not over half as wide, the ocellar triangle in female rather small, rarely almost equilateral; form rather slender. Genotype, *Mallota vittata* Meig.

The genus which most closely approaches Lejops is Aemosyrphus which, however, never has more than a very slight production of the hind tibiae (*mexicanus*), and has a much broader front in both sexes, very large ocellar triangle, broader abdomen, and more or less distinctly tuberculate face.

When Rondani proposed the name Lejops he included only the one species, *H. vittata* Meig. Subsequent authors have failed to find characters which would separate the genus from Helophilus and consequently several other names have been used which included at least part of the species which we place here. Schiner in 1864 proposed Anisimyia in his catalogue and included two
species, the first of which H. transfugus, Coquillett* designated as the type species in 1910. Verrall ignored it as it was merely a catalogue name, and while it does not concern us owing to the fact that the type species is included under Rondani's genus Lejops, it would be the next available name for this group, should Lejops ever be disallowed. Then, in 1883, Bigot described his genus Eurhimyia basing it upon E. rhingoïdes n. sp., which was later admitted by him to be the same as H. lineatus Fabr. We have retained this as a sub-genus, its affinities to the other species being quite evident, the differences being insufficient to warrant giving Eurhimyia generic rank. Girshner included H. humulatus in his genus Parhelophilus, with frutetorum and versicolor but as the former falls within our conception of Lejops, and we have accepted Parhelophilus for the last two species, there need be no further explanation.

Lejops—Table of Species—Males

1. Face produced into a long, acute cone...sub-genus Eurhimyia
   Face at most obtusely conical, not greatly produced... 2
2. Hind trochanters with a moderately long, obtuse
   projection or with a small sharp tubercle
   bearing black setulae; tibiae ending in spur... 3
   Hind trochanters and tibiae simple, the femora
   sometimes specialized... 5
3. Process on trochanters long and obtuse; tibial
   spur of moderate length... relictus n. sp.
   Process short, tubercular... 4
4. Spur on hind tibiae long and acute... chryso stomus Wd.
   Spur on hind tibiae short, not acute, rounded
   apically... distinctus Willist.
5. Abdomen without lunules beyond the second
   segment, although sometimes with the small
   inner ends apparent... 6
   Abdomen with very distinct lunules beyond
   second segment... 8
6. Sides of abdomen usually wholly narrowly red-
   dish beyond second segment; a rounded
   angle sub-basally on hind femora, the apical
   two-fifths more swollen; abdomen practically
   always with sub-median grey pollinose
   spots... bitinearis Willist.
   Sides of abdomen usually wholly black, beyond
   second segment, rarely partly reddish; grey

*Pr. U. S. N. M., XXXVII, 506.
spots wanting; femora with less pronounced basal angle and more evenly swollen
7. Anterior four femora practically all black haired ........................................... borealis Cole
Anterior four femora all yellow pilose......perfidiosus Hunter
8. Lunules strongly curving forward medianly (Europe) ............................................. transfigus L. Lunules scarcely curving forward, except front pair ............................................. lunulatus Mg.

Females
1. Second pair of lunules separated from side margins ............................... 2
   Second pair of lunules reach side margins ............................................. 4
2. Front femora black pilose ................................................................. borealis Cole
   Front femora yellowish pilose .......................................................... 3
3. Abdomen not with yellow lateral and apical segmental margins ................... perfidiosus Hunter
   Abdomen with yellow segmental apices and margins ................................ bilinearis Willist.
4. Hind femora red on entire surface above or antero-dorsally ...................... 5
   Hind femora with black patch covering part of dorsal surface ................... 6
5. Abdominal spots but little lunulate .................................................... lunulatus Mg.
   Abdominal spots strongly lunulate (Europe) ........................................ transfigus L.
6. Femora all black below ........................................................................... 7
   Femora not all black below with a broad reddish or piceous reddish elongate fascia... distinctus Willist.
7. Tibial spur long and acute ............................................................... **chrysostomus Wd.
   Tibial spur not acute ........................................................................... relictus n. sp.

Lejops relictus new species

Helophilus chrysostoma (Wied.), Williston, Synopsis, 190, 1886

Plate VII, figures 31, 32

Hind coxae of male with long apical projection; female with small tubercle. Abdomen of both sexes long, rather narrow, with nearly parallel sides, usually narrowed at apex of second segment with pale lunules, even though often chiefly reddish in male; the female lunules grey pollinose. In the two allied species the coxae bear no more than tubercles, in one the tibial spur

*These species were described in the genus Pterallastes.
**We have not seen the female; the distinctions given may be erroneous but seem probable.
is very long and slender, in the other shorter than in *chryso-
tomus*.

Length, 8 to 10 mm. *Male.* Face yellow, yellow pollinose, 
the oral margin to the angles and the cheeks, shining black; in 
profile rather deeply concave on upper two-fifths, the lower por-
tion very slightly, scarcely convexly receding; pile long, sparse, 
whitish. Front with a shallow depression just before the mid-
dle, in front of this, yellow, densely bright yellow pollinose, 
above black, with dense ochreous pollen, the ocellar band brown-
ish; pile yellow below, black above. Front narrow above, the 
side parallel, the ocellar triangle not very broad, the lateral 
half of the posterior ocellar line shorter than the median ocellar 
line, the ocelli separated from the eyes by about the width of 
one ocellus. Occiput grey pollinose, yellowish above. Pile yel-
low above, white elsewhere and on cheeks. Antennae ferrugin-
ous reddish, third joint slightly longer than broad, sub-circular; 
arista reddish, its apical half brown.

Mesonotum opaque black, the lateral margins moderately 
broadly and sub-median, rather narrow stripes, slightly converg-
ing posteriorly in most specimens, greyish yellow, yellow or pale 
yellow pollinose, the stripes broadly connected in front, narrowly 
so behind; and never as wide as the black stripe. Pleura yellow-
ish grey pollinose. Scutellum brownish, its apex to apical third 
or even more, reddish. Pile of thorax wholly yellowish, paler on 
pleura, not long, moderately abundant.

Basal two-thirds of anterior four femora, the hind ones except 
the base and sub-apical ring similar; front legs reddish, the 
tibiae with more or less brownish pre-apical bands, the last two 
tarsal joints fuscous. Hind tibiae and tarsi black, the former 
with a median band and sub-basal ring, reddish. Hind coxae 
with an obtuse, rather large prominence, its length as long, 
usually distinctly longer than its width, densely beset with short, 
black bristly hairs. Hind femora greatly swollen, the base and 
apex narrow; beneath on the swollen part, with stout, sub-
appressed, apically directed hairs, before the apex in front with 
five or six stout hairs on lower surface. Spur at apex of hind 
tibia moderately long, almost equal to length of third tarsal 
joint, its apex rounded, from ventral view.

Wings hyaline, strongly cinereous, rarely faintly yellowish, 
squamae whitish, with pale yellow border and fringe. Halteres 
pale yellow.
Abdomen variable; first segment grey pollinose; second segment opaque black, the apex shining, sometimes broadly reddish, but usually opaque black, rarely opaque brownish in color; the sides apically usually more or less broadly, diffusely reddish; basal three-fifths on either side broadly yellow, gradually widening behind to the middle where there is a short, usually concave in front projection, the hind margin slightly oblique, convex on inner half, the point of the arm usually appearing to distinctly reach forward, but the arm may sometimes be short and more robust, always rather widely separated from each other. Third segment rarely opaque black, usually opaque brownish or dull brick red, the apical margin always shining red, the red opaque color variable in depth and diffuse with the darker, more brownish color. On the basal third on either side, with an overlaying rectangular whitish pollinose spot. A yellow spot, the inner posterior end produced inwards as a rather narrow lunule, the inner ends reaching a little forward and slightly enlarged, the end rounded, moderately separated from each other, the arms sometimes obsolete basally. Fourth segment usually dull reddish, the apex broadly yellowish pollinose, but the region about the lunules may be brownish or blackish. The lunules are not complete, and are only moderately separated from the front margin in the middle, the arm actually reduced to two oval, slightly oblique yellowish pollinose spots, the lateral portion reduced to squarish spot. Genitalia red, sometimes more or less ferruginous. Pile wholly yellow, rather short, not abundant. Ventral segments more or less black or brown.

Female. Quite different, the thoracic stripes wider, the abdominal lunules greyish or reddish yellow. Face slightly prominent at oral margin as it is produced a little on the lower portion, instead of retreating. Front narrowed above, but still moderately wide; brownish yellow pollinose, paler on sides below, shining across ocelli; pile wholly black.

Mesonotum with the greyish or yellowish vittae wider, still not as wide as the black, the middle one usually beginning just back of the front margin, reaching the posterior margin narrowly. Pleura grey pollinose; pile shorter.

Abdomen opaque black, with similar shining areas as in male, and three pairs of yellow lunules, which are apparently always much brighter yellow than in distinctus. First segment grey pollinose; second with the lunules often as in male, but the inner
areas are a little stouter and less widely separated. Lunules on third segment are much as in male but closer to the base of segment as the lateral portion is very short; concave in front, convex behind, narrowly separated. A rectangular transverse apical spot on middle of third segment, grey pollinose, the shining apex of the fourth segment except usually a slender median line yellowish pollinose; fifth segment wholly greyish yellow pollinose, the middle line often darker on basal third or more. The yellow ground is limited to the sides of the lunules on second segment, the narrow lateral margins and narrow apices of the third to fifth segments.

Holotype—Male, Orillia, Ont., June 28, 1921, (Curran); No. 2292, in the Canadian National Collection, Ottawa.

Allotype—Female, Melrose Highlands, Mass., June 18, 1911, (J. D. Tothill).

Paratypes—Male, Melrose Highlands, Mass., June 18, 1911, (J. D. Tothill); two males, Orillia, Ont., June 28, 1914 and 1921, (Curran) male, Orillia, Aug. 3, 1921; two males, Lawrence, Kans., June 18 and 27, 1922, (Curran); male, Jefferson Junction, Wis., Aug. 12, 1919, (Fluke); three females, Lawrence, Kans., June 17, female June 16, female June 15, (Curran); female, North Fairhaven, N. Y., July 1, 1921; female McLean Bogs, Tompkins Co., N. Y., June 30, 1921; female, Arlington, N. J., May 29, 1918, (A. Nicolay); male, Fort Lee, N. J., June 4, 1905; two males, female, Orillia, Ont., July 20, 23, 1923, (Curran); female, Aylmer, Que., May 23, 1923, (Curran).

The females described above are a homogenous lot. We are not able to definitely distinguish the females of distinctus and relictus and do not believe that all the specimens included as females of the former belong there. However, the characters used seem to be fairly constant. H. distinctus has much greyer pollen, usually greyish, the apices of the segments are never yellow and the median black vitta extends over the front margin of the thorax. These characters are all weak but it seems better to employ them than to leave the female of distinctus not recognizable.
Lejops distinctus Williston

Helophilus distinctus Will., Synopsis, 192, 1886.

Plate VII, figures 37, 38

Very similar to relictus but evidently distinct. We believe a comparison between the two species will serve better than a full description.

Length, 7.5 to 9.5 mm. Male. Facial concavity not quite as deep and slightly longer, the lower portion of the face hardly as long as the upper; ground color rather brownish with a large yellow area on the slopes, but merely appearing dirty owing to the pollen. Front dark in ground color except the W. First two antennal joints brownish.

Thorax vitiae grey, somewhat wider, but not as wide as the black stripes. Hind femora more broadly yellow at base, their under side yellow or obscurely so on their whole length, the black bristles shorter and less abundant. Hind trachanteres with a small acute tubercle bearing black hairs.

Abdomen with the same variation in color. The lunate on the second segment do not reach greatly inwards, being only small points and their ground color is wholly yellow except the very small inner point, the yellow reaching more towards the hind margin and being more oblique, while in relictus it is reddish on the posterior part. The yellow on the sides of the second segment reaches three-fifths to the apex and the oblique pollinose lunule rises from its posterior end and is strongly curved basally, the inner end ovally enlarged and always more oblique. The sides and apex of the fourth segment are broadly pale yellowish or whitish pollinose, the strong lunulate spots rising about the basal third, their inner ends enlarged and much more oblique, their bases may sometimes be considerably reduced. The lunules are all situated upon reddish or yellowish ground.

Female. Face as in male. Front dark in ground color as in male, pile all black. Thorax greyish, the middle mesonotal line reaching over the front slope. The femora are even paler than in the male, and this seems to be the only distinctive character as they are quite dark in relictus. First abdominal lunules a little more widely separated, the ground color of the lunules more extensively pale than in dark specimens of relictus.
Curran & Fluke—Helophilus and Allied Genera 261

We have two males, Englewood, N. J., female, Arlington, N. J., two females, Melrose Highlands, Mass., June 17, 18, (J. D. Tothill).

There seems little doubt about the distinctness of the two species, although it seems possible that there might be intermediate forms. The tibial spur is a little shorter and broader apically in this species than in \textit{relictus}. In an additional male from Melrose Highlands, taken on same date as one of the females, the trochantral tuft is longer but we cannot see that the tubercle is more prominent, and the face is wholly yellow, the ground color of the anterior portion of the front dirty yellowish. The hind femora are similar in color.

\textit{Leiops chrysostomus} Wiedemann


In the male, the spur on the hind tibia is very long and acute, the trochantral process is small and acute as in \textit{distinctus}, the hind femur is much more swollen than in the allied species.

Length, 10 mm. \textit{Male}. Face and front below the depression yellowish red, the cheeks piceous brownish, the jowls reddish; the reddish parts densely yellow pollinose, only a narrow supra-antennal shining border. In profile the face is deeply concave on the upper half, the lower half gently convex and slightly more prominent than the antennal protuberance, the upper tip of the oral margin is not noticeable and situated on a plane with the lower border of the eyes, the oral angles rather broadly rounded and not produced as far below the eyes as the width of the third antennal joint. Sides of front on almost the upper two-thirds parallel, this part of the front black, more or less densely yellow pollinose, the ocellar region with blackish brown pollen, so that the front is not at all shining; the pile is moderately long, black, on the reddish ground and face, long; yellow. Occiput black, rather densely yellow polinose, with yellow pile, which is shining in some lights. Antennae yellowish red, third joint sub-ornicular, slightly longer than wide, the arista brown.

Mesonotom opaque black, the side margins more broadly than the black vitiae, and broadly separated sub-dorsal stripes greyish yellow pollinose, these stripes broadly united in front, narrowly so posteriorly, the sub-dorsal stripes hardly half as wide as
the median black one. Pile short, wholly yellow. Pleura brownish or ferruginous, pale yellow pollinose, behind with whitish pollen, the pile pale brassy yellow. Scutellum with a black, posteriorly convex base, the margin broadly yellowish; pile all yellow, long, not abundant.

Basal half of front four femora, the hind ones except the narrow base and apex beyond the swollen part, yellow, the yellow more extensive above on the hind ones, the immediate apex brown. Front four tibiae and tarsi, basal three-fifths of hind tibiae, except a sub-basal, broad, darker band, and the hind tarsi, yellow, all the tarsi darker, more reddish apically, the apical one-fourth of the hind tibiae brown. Hind femora greatly swollen, widest about apical third, below on the apical half, with numerous black, fairly long bristles, at the base with some short, condensed, fine pale yellow pile, the pile elsewhere yellow. The pile on the legs pale yellowish, on the hind tarsi chiefly black. Tibial spur long, acute. Trochantral process short, acute.

Wings cinereous hyaline. Squamae yellow, with yellow border and fringe. Halteres pale yellow, the knob somewhat darker.

Abdomen probably variable, but always less blackish than in allied species. First segment blackish, more brownish laterally, densely grey pollinose. Second segment with a pair of longitudinal pale yellow triangles on the basal two-thirds laterally, widened posteriorly, the anterior inner margin oblique, so that it leaves a large, basal, longitudinal opaque or sub-opaque black triangle, the apical portion of which has the sides parallel; this portion limited anteriorly by a rounded angle, before which the margin of the black triangle is gently concave; the base of the black triangle is broadly separated from the side margins. Behind the yellow triangles the color is shining reddish, but is separated from the yellow by an opaque, rather ferruginous fascia. Third segment dull reddish, the apex broadly shining, on the sides with a long basal yellow longitudinal triangle, the front border broadly, a narrow post median fascia and slender connecting middle line dull ferruginous. Fourth segment all red or with two or three diffuse darker areas, the apical third shining, elsewhere opaque, the sides on the dull portion broadly white pollinose. Usually there is a broad, whitish pollinose lunule occupying most of the yellow triangles on the second segment and the inner arm of a lunule is indicated by an oblique,
oval whitish pollinose spot on either side of the middle line of the fourth segment.

Female. (Translation from Wiedemann). Antennae rusty yellow, face and front yellow pollinose; occiput blackish. Thorax deep black, the vittae pale yellow; pleura with shining greyish hair. Scutellum black, the apex somewhat transparent yellow. First abdominal segment whitish grey pollinose; second deep black at the base, on each side with an oblique white band, at the apex rusty yellow, so that the band forms the figure of a goblet; third to fifth segments rusty yellow, on the base of each on either side whitish, the third also with two smaller, the fourth with two larger, whitish transverse spots; the segmental incisures whitish. Wings shorter than the abdomen, yellowish, with small black-brown stigma. Femora black, with rusty brown apex, the hind ones very much swollen; fore tibiae and tarsi rusty yellow; hind tibiae rusty brown, merging into chestnut brown, the apex black; hind tarsi black, their first joint brown.

The description is drawn from male, Washington, D. C., May 17, 1912; and male, Petersburg, Chesterfield Co., Va., June 1, 1917.

It will be seen at once that the female described by Wiedemann is not conspecific with the specimens included by Williston under either chrysostomus (Wied.) or distinctus Will. as the color of the abdomen is much more reddish than in any specimens we have examined. It is necessary to separate the species on color because Wiedemann did not mention the trochanral process or tibial spur. The color of the legs applies better to the two males which we have than to other males.

**Leiops lunulatus** Meigen


*Helophilus hamatus* Loew, Cent. IV, 79, 1863. (Hudson Bay Terr., Canada).

Plate VII, figures 29, 30

*Helophilus hamatus* Loew is a synonym. Abdomen tapering, with three pairs of fascia; scutellum normally all pale haired;
fourth abdominal segment with opaque fascia beyond lunules in female; face prominent below.

Length, 8 to 11 mm. Male. Face yellow, densely white pollinose, cheeks an dorsal margin to the base of the angles, shining black; pile long, fine, whitish; in profile concave above, the lower half or third more produced, almost or quite as much as the antennal prominence, very slightly more prominent above, scarcely convex, the lower third of the face lying below the eyes, the buccal margin oblique, straight, the face thus forming an obtuse cone. Front yellow below the depression with dense whitish or whitish yellow pollen, depression not deep; above the depression the ground color black, yellow pollinose the sides narrowly opaque black, the upper fourth shining. Pile pale yellowish before the suture, black above. Lateral half of posterior ocellar line about equal to distance from lateral ocellus to eye. Occiput grey pollinose, more yellowish above, with yellow pile, whitish on sides and cheeks. A few black, short hairs above behind the eyes. Antennae reddish, arista slightly darker, its apical half brown, tapering on basal third.

Mesonotum sub-opaque black, usually with a narrow, opaque, middle line; the side margins rather broadly greyish yellow pollinose, the pollen extending broadly inwards along the front margin to form the base of the rather slender dorsal pollinose stripe of the same color, the stripes slightly irregular, somewhat broadened behind, narrowly connected along the posterior margin with the lateral stripes. Pleura rather thickly grey pollinose. Scutellum translucent dull reddish, the base and corners black. Usually the pile is all bright yellowish, but the scutellum is sometimes black pilose on its disc.

Legs reddish; front femora on more than the basal half, except on the broad frontal margin, sometimes less so, middle on nearly its whole length below, more widely at the base, and a broad, elongate sub-basal spot above, sometimes more or less obscurely connected in front with the ventral stripe, a rather small, sub-quadrate spot on front of hind femora, the hind ones behind on almost their whole length, much more narrowly so on apical third, shining black. Hind tibiae with broad sub-basal and sub-apical piceous bands; hind tarsi wholly black. Last three joints of front four tarsi brownish, the front ones paler. Hind femora below with short black spinules and several
long, pale hairs, legs elsewhere pale pilose. Hind femora moderately swollen, their tibiae curved at base and apical sixth.

Wings cinereous hyaline, sometimes faintly yellowish, rarely markedly so. Squamae whitish with pale yellow border and fringe. Halteres pale yellow.

Abdomen opaque black, the lateral margins, first segment chiefly, the apices of the second to fourth segments broadly, shining. First segment thinly greyish pollinose, except a spot on either side, the lateral margin rarely broadly yellow; second segment with the lateral margin broadly yellow on almost its whole length, gradually increasing in width to about the middle of the segment, thence carried slightly obliquely inward to form an acute point in line with the oblique posterior margin, the anterior margin of this projection often gently concave, the spot chiefly greyish yellow pollinose; the pollen actually forms the points as the yellow ground color has often only a small interior projection. Sides of remainder of abdomen and broad apex of fourth segment at least narrowly yellow or reddish, the apex of the second and third segments yellow in pale specimens. Usually the yellow portion of the lunule on the third segment is in the form of a rectangular, longitudinal spot on the basal half of the segment, the overlying pollen forming the arms, which are slightly concave in front, their inner ends slightly nearer the anterior margin, the lunules moderately separated from each other in the middle; the base of the fourth segment bears two large, narrowly separated greyish or greyish yellow pollinose spots, occupying about half the length of the segment laterally, their posterior border usually convex on inner half; in addition there is a rather narrow, thinly pollinose band of the same color just behind the opaque fascia. Pile usually all pale yellow, short, but often some black pile on apices of third and fourth segments in the middle.

**Female.** Dissimilar, the thoracic stripes wide, the abdominal lunules different in shape. Face similar. Front black, the W yellow, yellow pollinose, dark across vertex; pile all black; gently convex, with a longitudinal depression above; front wide, narrowed above, the lateral half of the posterior ocellar line much less than ocellar-orbital line.

Mesonotum greyish yellow or yellowish pollinose, the median stripes sometimes greyish on posterior half, somewhat widened posteriorly, not quite as wide on most of their length at the three opaque black stripes, the middle black stripe entire, but
narrowed posteriorly, the lateral ones broadly separated from
the front, very narrowly from the hind margin, lateral stripes
narrowed posteriorly. Rarely the front of the middle vitta is
thinely pollinose. Pleura greyish yellow and greyish pollinose.
Legs and wings as in male.

Abdomen opaque and shining as in male, the first segment
grey pollinose except for sub-lateral apical spots. In typical
specimens (*hamatus* Loew), there is very little yellow on the
abdomen, only the sides of the second and third segments, nar-
row lateral margins of fourth and fifth, and their narrow apices
reddish. The lunules on the first segment are as large and as
complete, the arms a little broader than in the male, their inner
ends less widely separated. On the third segment the lunules
are much as in male, but less convex behind, slightly oblique,
more or less, sometimes scarcely, concave anteriorly, their inner
ends closer to front margins than lateral fourth, touching the base
and lateral margin rather broadly. The following lunules are
closer to the base of the fourth segment, separated sub-laterally
by a narrow, apically convex transverse spot which reaches
narrowly quite across the base at the middle, the lunules very
narrowly separated. All the lunules greyish. There is a sub-
oval transverse pollinose spot before the apex of the third seg-
ment; the shining portion of the fourth segment, widest at mid-
dle; fifth segment entirely with greyish or greyish yellow pollen
except a narrow stripe on basal half or more of middle line. In
some specimens the lunules are all yellow in ground color, the
sides of the abdomen wholly yellow, the apices of the second
and following segments, the fifth wholly, reddish; in such cases
there is very little shining black color. These examples present
a very different appearance, but intergrading forms are found.
Pile as in male, the fifth segment wholly pale haired.

Over 50 specimens from Quebec, New York, Ontario, Wis-
cconsin, Manitoba and Alberta.

The male will hardly be confused with *bilinearis*. The female
is readily distinguished from *bilinearis* and *perfidiosus* by the
second lunules reaching the margins, the wide opaque bands and
more extensive pollen behind the lunules, etc.

*Lejops lunulatus* is common in May in Ontario on Caltha
bloom, but occurs also on most bloom near swampy land. Both
*bilinearis* and this species occur together, but the former ap-
ppears to be a little earlier.
The synonymy of this species need not worry us in North America. Loew described *Helophilus hamatus* from the Hudson Bay Region and his specimen does not differ in the least from several specimens before us, all of which have been compared with the type. The face shows slight variation and for a long time we considered both species as valid, but the series before us proves that this is not the case. The brightly marked females, with more yellow thoracic and abdominal pollen appear very distinct by themselves but there is a perfect series of intermediate forms. The specimens from Alberta have considerable black pile on the scutellum, but are quite evidently not distinct, and are really more typical of the European form.

*Leips bilinearis* Williston

*Helophilus bilinearis* Will., Synopsis, 295, 1886

Plate VII, figure 33, 34

Allied to *lunulatus* Meig., distinguished in the male by the absence of abdominal fasciae except on second segment. The female has the abdominal lunules of the third and fourth segments separated from the side margins, and wholly pale haired scutellum. In the mountain species (*Pterallastes perniciosus* Hunter) the abdomen of the male is wholly black beyond the second segment, never margined with yellow.

Length, 9.5 to 11 mm. Male. Face yellow, thickly white pollinose, the narrow oral border and cheeks shining black; in profile the upper three-fifths concave, with a slight tubercle below the concavity, the lower two-fifths slightly retracting, not quite as prominent as the antennal base; pile long, sparse, whitish. Front yellow before the depression, but darker immediately before it, white pollinose; upper portion shining black, before the ocelli moderately thickly yellow pollinose, thinly pollinose above; depression at lower two-fifths, very shallow; sides above slightly diverging behind, considerably diverging in front of depression. Ocellar triangle broad, the centre of the posterior ocellar line but little more than the width of an ocellus from lateral ocellus, the lateral ones much more than their width from the eyes. Pile yellow before the suture, longer, more abundant behind it. Occiput grey pollinose, long yellow pilose above, with shorter, almost white pile on middle, longer whitish
pile below and on cheeks. Antennae ferruginous reddish, the third joint elliptical, broader than long; arista brown, thickened on basal third.

Mesonotum dull blackish brown, the side margin rather broadly dull yellowish pollinose, the pollen extending inwards along the front margin over half way to the middle line. Sometimes the pollen is more greyish, the general color blackish, with a slender, complete pollinose vitta sub-medianly, greyish yellow, and a slender middle line on anterior two-thirds, shining black. In one large specimen there is a grey pollinose dash on anterior sixth on either side of the middle line. Pile all moderately short, yellowish.

Color of legs somewhat variable. Front and middle femora black on basal two-thirds or more, in front broadly red for its whole length or with an obscure, brownish sub-basal interruption. Hind femora with a large black spot on basal three-fifths in front, behind all black except the base, apex above narrowly black; the base in front and rest of joint reddish. In one specimen the hind femora are all black except on apical two-fifths behind. Front four tibiae reddish slightly darker sub-apically; hind tibiae with yellowish base, the middle half and under side on whole length, and apex, reddish, sub-apical band blackish, sub-basal band brownish, hind tarsi black; anterior tarsi reddish, their anterior margin above and the last two joints, fuscous; middle tarsi reddish their last two joints brownish. Posterior femora moderately enlarged, laterally compressed, with a small sub-basal swelling below, and bearing short, rather dense setulae below, the anterior black spot with short black pile, legs elsewhere pale yellowish pilose. Hind tibiae curved at base and apical fifth.

Wings cinereous hyaline, stigmal spot short, fuscous. Squamae white, with yellow border and fringe. Halteres pale yellow.

Abdomen shining black, sides of first segment, the second segment, except the broad posterior margin, a longitudinally placed sub-basal rectangular spot on the third segment, concave on its sides, and usually an oval spot in similar position on the fourth segment. Second segment with the lateral margin broadly yellow, slightly widened to the middle of the segment, thence extending slightly anteriorly inwards to a sharp point, the posterior margin oblique and almost straight, the lateral margin
on the apical sixth only narrowly reddish yellow: the inner portion of the spots is composed wholly of pollen, which may sometimes be lacking, in which case the yellow forms only a sharp angle interiorly. Beyond the second segment the lateral margin is wholly reddish or orange, the apex of the fourth segment more broadly so, the apex of the third segment more piecous, but often similar in color to the margins. Sometimes there are very faint indications of complete grey pollinose lunules on the third segment rising just inside the yellow margin, extending obliquely back to near the middle of the segment thence curving inwards their last section more distinct, situated just before the middle of the segment, moderately separated by the opaque black spot; as a rule only the inner ends of the lunules are conspicuous and these may be very small. The fourth segment bears a sub-cordate, sub-basal grey pollinose spot in the middle, which almost entirely encloses the oval opaque black spot; sides also broadly grey pollinose. Hypopygium usually almost all blackish, rarely almost all reddish, with thin yellow pollen. Pile all short whitish or pale yellowish, only the apices of the second to fourth segments, successively more widely so, with short black pile.

**Female.** Quite different in thoracic and abdominal maculation. Face sometimes slightly more prominent below as the tubercle may rarely be almost wanting. Front wide, sides divergent below, the ocellar triangle not larger than in male and therefore the lateral ocelli are separated from the eyes by more than the length of the median ocellar line. There is no trace of a depression and the blackish ground color extends down almost or quite to the red W, not so far on the sides; the lower third is covered with abundant whitish pollen, elsewhere with yellow pollen, the upper third almost bare. On either side of the ocelli is a broad longitudinal depression running to the upper third.

Mesonotum greyish yellow or greyish pollinose, with three back vittae which are not wider than the grey ones, the median one sometimes interrupted by a very slender middle line; lateral ones broadly separated from front margin, narrowly from the hind, the middle one reaching the anterior margin in a less deep or brownish color and distinctly reaching the hind margin.

Legs usually with slightly smaller black markings, the bands
on the hind tibiae paler in color. Wings somewhat yellowish tinged.

Abdomen with the sides sub-parallel, only a little tapering on the first four segments. Grey pollinose lunules of first segment shaped moderately as in first male mentioned in description, the inner arms usually slightly wider, the yellow ground color more restricted. Second segment with only slightly lunulate spots which do not reach the side margins narrowly separated from each other in the middle, widely separated from the base; fourth segment with the spots still less lunulate, very narrowly separated in the middle and reaching the side margin narrowly; in the middle there is a narrow longitudinal black line which is bordered behind the lunule by greyish pollinose except a basal median dash and an incomplete basal fascia which is not always visible. First segment wholly grey pollinose. Sides of second and following segments narrowly, and narrow apices of the third, becoming broad on the fifth, segment, yellow or reddish; the sides also thinly grey pollinose.

Specimens examined: male, Flushing, N. Y., female, N. Y.; male, Aweme, Man., May 9, 1915, (N. Criddle); 2 males, Orillia, Ont., April 28, 1921, (Curran); 2 males, Orillia, May 2, 1921; male, Orillia, May 5, 1921, female, Orillia, May 2, 1921; male, Ironside, Que., May 11, 1916; female, Madison, Wis., May 18 1918; female, Ithaca, N. Y., June 2, 1918, (E. G. Anderson); female, Hull, Que., May 16, 1901, (Harrington); female, Ottawa, June 3, 1903, (Harrington); female, Hull, Que., May 30, 1903, (Harrington); female, Madison, Wis., May 6, 1920, (Fluke); female, University Campus, May 25, 1921; female, same data, May 7, 1922.

This species is readily distinguished in the male by the almost entire absence of lunules except on second segment. The female has been confused with _lunulatus_ but is readily distinguished by the second lunule not reaching the sides of the segment, and the absence of an opaque crossband behind the third fascia. From (_Pterocallastes_) _perfdiosus_ the female is readily distinguished by its usually more reddish legs and by the yellow ground color on sides and apices of terminal segments.
Lelops perfidious Hunter

Pterallastes perfidious Hunter, Can. Ent., XXIX, 139, 1897.

Plate VII, figure 39

Closely allied to *H. bilinearis* Willist., but the mesonotum is even darker and seldom with thin, yellow, incomplete vittae, the abdomen not pollinose beyond the second segment in male; female very similar to *bilinearis*, but there is no yellow or reddish ground color beyond the second segment. A comparison with *H. bilinearis* will serve better than a full description.

Length 10 to 11 mm. *Male*. Front slightly wider, the upper portion actually slightly wider than the length from the suture to posterior angle of eyes, (in *bilinearis* it is exactly square); face generally a little more receding below. Front usually darker in ground color on lower portion.

Mesonotum of a deeper, duller black, the middle line and submedian vittae shining black, sometimes obsolete, the later usually shortly yellowish pollinose anteriorly; no pollen between these vittae in front.

Femora usually more extensively black, rarely as in *bilinearis*.

Abdomen often with the spots on second segment similar, but seldom projecting as far inwards, never as thickly nor extensive-ly pollinose. A small spot on the anterior angles of the third and fourth segment and posterior margin of the fifth, reddish; opaque black markings of last two segments smaller, the posterior one sometimes obsolete or nearly so; posterior margin of the third rarely obscurely reddish; rarely with a slight trace of the inner arms of the grey lunules, on the fourth segment.

*Female*. Front slightly wider, and more swollen. Legs a little more blackish, the band on the hind femora entire (not always so?).

The chief differences are found in the abdomen. There are absolutely no reddish markings except on basal corners of the second segment. The abdomen wholly lacks greyish or yellowish pollen except on the first segment and on lunules. The wholly shining fifth segment is distinctive.

Four males, Banff, Alta., May 29, 2 males, June 9, male, June 3, female, October 5, 1922, (C. B. D. Garrett); male, Banff, Alta., June 23, 1909, (N. B. Sanson); male, Penticton, B. C.,
May 1, 1919, (E. R. Buckell). 1 male, B. C. Specimens from Washington State have also been examined.

This species is so very like *bilinearis* that it might well be considered only a variety were the characters not so constant and the female not so markedly distinct. The thorax and abdomen are both darker than in *bilinearis* and the superficial appearance is more distinct than a close examination indicates.

There has been no question about the identity of the species. Hunter evidently had not seen *bilinearis* or he would not have placed the species in *Pterallastes*. Notwithstanding the rather non-Helophiline appearance, there is no indication of relationship with *Pterallastes*, a genus with a much shorter face, longer third antennal joint and less deeply curved third vein. The species described by Cole as *Pterallastes borealis* is very close to *perfidiosus* but appears to be distinct. The mesonotum of the female bears narrower pale vittae, the femora are largely black pilose, etc.

Mr. E. E. Wehr has kindly compared a specimen with Dr. Hunter’s type in the University of Nebraska Collection and pronounces our specimen as absolutely identical in all respects.

**Lejops borealis** Cole


**Female**: Length 13.5 mm. Very near *P. perfidiosus* Hunter. Antennae black, arista brown and bare, third joint about as broad as long. Middle of face and triangle in front of cheeks shining black, otherwise yellowish pollinose and pilose, with yellowish ground color under the pollen. Vertex black; frons yellowish pollinose, with erect black pile. Occiput yellowish grey with yellow pile and a few black hairs above eye margin. Proboscis black.

Mesonotum opaque black, with yellowish pollen on lateral margins and two faint yellow longitudinal stripes, widely separated and narrow; pile rather dark yellow. Narrow base of scutellum black, the rest translucent yellow, rather densely yellow pilose. Pleura semishining black, with black pile. Halteres small and yellowish, the stigmata below halteres with short, dense, fur-like, bright yellow pile.

First abdominal segment semishining black, second with broad
yellow lateral margin, the yellow portion triangular in shape and reaching one-third distance across abdomen; third segment with small round yellow spot on anterior corners; remainder of abdomen black, the posterior portion of 2 to 5 shining, the basal portion opaque; a pair of linear, oblique, yellow pollinose marks on dorsum of third and fourth segments. Pile of abdomen largely yellow, black on posterior margins of third, fourth and fifth segments. Venter semishining black, with sparse whitish yellow pile. Legs black, extreme tips of femora and bases of tibiae; pile of front femora and most of pile of middle and hind femora; black; some yellowish pile; hind tibiae arcuate; hind femora noticeably thickened and with black bristles below, short and dense on outer third; short pile below on tarsi golden yellow. Wings hyaline; anterior cross-vein slightly beyond middle of cell 1st A.

Male: Length 11.5 mm. Very nearly the female in appearance. Eyes widely separated, frons almost twice as wide as ocellar tubercle; vertex noticeably convex, a depression between it and antennal protuberance. Abdomen lacks oblique yellowish pollinose marks on third and fourth segments. Hypopygium quite large, blackish, with short yellow pile.


Type locality—St. Paul Island, Alaska.

Subgenus EURHIMYXIA Bigot

This subgenus contains only two species known to us, one North American, the other European. Osten Sacken regarded them as identical, but Williston recognized the American species as distinct. The two species are very close, but seem to present, small, though constant distinctions.

The character distinguishing the group as a subgenus of Lejops, is the production of the face forward and somewhat downward into a long, acute cone. The character is quite evidently of little generic value and we consider the species as forming only a sub-genus.

The two species before us may be separated as follows:

a. Face in both sexes very evidently concave below antennae; front of male never wholly black

18
pilose; abdominal pale markings a little more extensive, lunules of female markedly enlarged inwardly ——— stipatus Walk. Face in both sexes very slightly or not concave below antennae; front of male wholly black pilose; abdominal spots smaller, lunules of female but slightly enlarged inwardly ——— lineatus Fabr.

Lejops (Eurhinyia) stipatus Walker

Helophilus stipatus Walk., List III, 602, 1849, (N. Y.)
Helophilus anausis Walk., List. III, 603, 1849. (Ont.)
Helophilus lineatus O. S., Cat., 134.
Helophilus conostoma Williston, Syn., 193, 1886. (Conn.)

Plate VII, figures 35, 36

Face produced forward and slightly downward into a long, acute cone; small compact species. There is no closely allied species in North America and the sharply conical face will at once distinguish it.

Length, 8 to 9 mm. Male. Face yellow, thickly yellowish pollinose; in profile slightly concave below the antennae, thence obliquely produced forwards, sometimes with one or two slight swellings; oral margin and cheeks broadly shining black, the former in front and the latter behind more or less pollinose; pile long, sparse, whitish. Front dark in ground color except immediately above the antennae, the anterior half paler, and densely yellow pollinose, the upper half largely shining but more or less, thickly below, brownish yellow pollinose; pile sometimes all pale before the depression, at other times practically all black; or intermixed. Ocellar triangle broader than long, the lateral half of the posterior ocellar line shorter than either the middle ocellar line or the ocellar-orbital line. Occiput yellowish pollinose, sub-shining behind vertex, with a less densely pollinose, elongate spot behind the eyes above, but broadly separated from them. Pile yellowish, a few of the orbital ciliae black. Antennae black, the third joint orange, sometimes somewhat fuscous above, broader than long, elliptical; arista brownish or brownish red, tapering on basal third.

Mesonotum opaque black, the lateral margins broadly yellow pollinose, a narrow complete line on either side of the broad middle black stripe, yellow or greyish yellow pollinose, slightly
widened and usually greyish posteriorly; in front broadly connected with the side margins. Pleura greyish and greyish yellow pollinose. Scutellum sub-translucent reddish yellow, the base and angles black. Pile wholly yellowish.

Legs reddish, front femora on basal third, sometimes reduced to anterior and posterior spots, middle femora on slightly more than basal third, on over basal half above and below, sometimes reduced to dorsal and ventral broad stripes, apical half or less of front tibiae and their tarsi wholly black; middle tibiae with two darker bands, one sub-apical the other before the middle. Hind femora with a large spot on upper middle half, a spot on anterior surface at the apical constriction, sometimes connected with the dorsal spot, and a spot above the apex, shining black, all sometimes slightly reduced. A sub-basal and preapical blackish, brownish or ferruginous broad band on hind tibiae. Hind tarsi black. Hind femora considerably swollen, with black bristles below on apical three-fifths.

Wings more or less luteous, cinereous apically. Squamae white, with pale yellow border and whitish fringe. Halteres whitish yellow.

Abdomen rather robust, but not or only slightly wider than thorax, slightly narrowed apically, opaque black, with three yellow or yellow pollinose fasciae. Sides of first segment greyish pollinose. Second segment with large median triangles, their posterior ends directed obliquely outwards to join the side margin about the apical sixth, their front margin concave, directed obliquely forward to reach the base of the segment well inside the anterior angles, the inner ends rounded, rather pointed anteriorly; sometimes the lateral margin behind is reddish. Third segment with basal spots occupying three-fourths the length of the segment, their posterior surface scarcely convex, their inner apical half produced inwards, truncate, the black ground color extending lateral in front for almost a distance equal to the distance separating the spots. Fourth segment with the side margins broadly, the rather broad apex and a pair of broad, obtuse, moderately separated, rectangular spots on basal half, narrowly separated from the base, yellow, or greyish yellow pollinose. Sides of last two segments wholly narrowly reddish. Pile all yellowish. Two middle segments of venter without black color. Genitalia thickly pollinose.
Female. Quite different in color of thorax and abdomen. Front wider, slightly narrowed above, wholly black pilose.

Mesonotum with the median lines wider, but still not more than half as wide as the lateral black stripes, except behind, the side margins more greyish yellow, the pleura greyish pollinose.

Abdomen often largely sub-shining, the lunulate spots only yellow in the ground color laterally, the side margin elsewhere black. First segment wholly grey pollinose. Second with the lateral portion of the spots narrower with almost parallel sides and not quite as long, the lunules rather long, moderately concave in front and convex behind, their inner ends somewhat enlarged and rounded, broadly separated; lunules on third segment mostly beyond the middle, but rising before the middle, less widely separated, but very similar in shape to the first pair; fourth segment with the lunules narrower, before the middle of the segment, rising at the anterior angles, less widely separated medianly, narrowly separated from the front margin, the black base convex, but the lunules less curved than on preceding segment. A transverse oval spot on apex of second segment in the middle, the posterior margins of the two following segments more widely medianly and their rather narrow lateral margins and the fifth segment except the base, grey pollinose; or the base of the fifth segment may bear a triangular median basal black spot and no fascia. In immature specimens the pollen is more yellow.

Forty specimens of both sexes from: Quebec, New York, Ontario, Wisconsin, Manitoba, and British Columbia.

There has never been any question about the identity of this species since Williston described it as *H. conostomus*. Osten Sacken considered it the same as the European *H. lineatus* and it was recorded as such by him. Walker's description is short but this is evidently the same species described by him as *H. stipatus* and also *H. anausis*. We have seen specimens from the region of Martin's Falls, the type locality of *anausis*, and there is no other species which agrees at all with Walker's descriptions. The European species is very similar.

*Eurhimmia lineatus* Fabr.

A pair of this species from Denmark show practically no differences from *stipatus* except those mentioned in the table, but
there is little doubt about the two being distinct. Upon exami-
nation they appear more distinct than can be demonstrated by
description. The differences noted by Williston will not hold
in their entirety as several of the characters are more or less
subject to variation.

EXPLANATION OF PLATES.

All drawings were made with the aid of the camera lucida, and are
all drawn to the same scale. Enlarged about 10 diameters.

PLATE V.

Figure 1. Helophilus obscurus, abdomen of female.
2. Helophilus obscurus, abdomen of male.
3. Helophilus trivittatus, profile of head, male.
4. Helophilus groenlandicus, abdomen of male.
5. Helophilus groenlandicus, abdomen of female.
6. Helophilus fasciatus, head of male showing narrow front.
7. Helophilus latifrons, head of male showing broad front.
8. Helophilus latifrons, profile of head, male.
9. HELOPHILUS INTENTUS, n. sp., abdomen of male.
10. Helophilus intentus, profile of head, male.

PLATE VI.

Figure 11. Helophilus hybridus, abdomen of male.
12. Asemosyrphus willingi, profile of head, male.
13. Asemosyrphus mexicanus, profile of head, male.
14. Parhelophilus frutetorum, hind femur, male.
15. PARHELOPHILUS REX, n. sp., abdomen of male.
16. Parhelophilus rex, profile of head, male.
17. Parhelophilus versicolor, underside of hind femur, male.
18. Parhelophilus porcus, profile of head, female.
20. Parhelophilus laetus, abdomen of male.
22. Parhelophilus laetus, wing.
23. Parhelophilus integer, profile of head, male.
24. Parhelophilus obsoletus, hind femur, male.

PLATE VII.

Figure 25. Parhelophilus divisus, hind leg of male.
26. Lunomyia cooleyi, profile of head, male.
27. Lunomyia cooleyi, top view of head, male.
29. Lejops lunulatus, abdomen of female.
30. Lejops lunulatus, abdomen of male.
31. LEJOPS RELICTUS, n. sp., abdomen of male.
32. Lejops relictus, n. sp., hind femur and tibia of male.
33. Lejops bilinearis, abdomen of female.
34. Lejops bilinearis, abdomen of male.
35. Lejops (Eurhymia) stipatus, abdomen of male.
36. Lejops (Eurhymia) stipatus, profile of head, male.
37. Lejops distinctus, hind femur and tibia of male.
38. Lejops distinctus, profile of head, male.
39. Lejops perfidiosus, abdomen of male.
40. Mesembrius, profile of head, female.