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Two New North American Species of Syrphidae, with Notes on *Syrphus* (Diptera)

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Through the cooperation of the American Museum of Natural History, from Dr. C. H. Curran, and the Canadian National Museum, I have received for study a large series of species of *Syrphus* and related genera, mostly from the arctic regions of Canada. This fine collection of specimens together with recent additions from other parts of North America has helped me to understand better the species in this difficult genus and to recognize a new species which for a long time has been a manuscript name, waiting for the appearance of the male. Two other new species have been found, one of which is described here.

The genus *Syrphus* as presently accepted includes only those species with hair on the upper disc of the squamae, non-pilose metasterni, emarginate edges on the abdomen, and male genitalia with an elongate cylindrical lingula on the penis sheath (fig. 9).

KEY TO THE SPECIES OF *Syrphus* FROM NORTH AMERICA

1. Eyes distinctly pilose *torvus* Osten Sacken
Eyes bare 2
2. Emarginate edges of the abdomen continuously yellow, second and third abdominal bands continuous *hinei* Fluke
Emarginate edges entirely black or alternately black and yellow, if entirely yellow the abdominal bands are interrupted 3
3. Second and third abdominal bands entire and do not reach the side margins, front of both sexes largely yellow *opinator* Osten Sacken
These bands reach the side margins, if not, they are broken into spots . . . 4

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4. Spicules underneath the mid metatarsi yellow 5
 These spicules black 6
5. Abdominal bands reach the sides in nearly their full width, sides of mesonotum distinctly yellow pollinose *knabi* Shannon
 Abdominal bands narrowed as they reach the sides, sides of mesonotum very indistinctly pollinose, femora entirely yellow *currani* Fluke
6. Abdominal bands interrupted or greatly excised, if entire, very narrow 7
 Abdominal bands on third and fourth segments not interrupted, broad 9
7. Abdominal bands broad and interrupted, occupying nearly one-half of the length of each segment *attenuatus* Hine
 Abdominal bands narrow, occupying less than one-half of the length of each segment 8
8. Face with a brownish vitta, spots on second segment of female not much wider than width of following bands *autumnalis*, new species
 Face entirely yellow, spots on second segment of female twice as wide as the width of following bands *jonesi* Fluke
9. Face with a median brownish vitta *vittafrons* Shannon
 Face entirely yellow 10
10. Antennae mostly reddish, third segment narrowly brownish above, if doubtful, the tiny hairs at ends of hind femora usually black; femora of female entirely pale colored *bigelowi* Curran
 Antennae mostly blackish, narrowly reddish below 11
11. Males (eyes holoptic) 12
 Female (eyes dichoptic) 15
12. Pile of face nearly all black, hind femora black on basal two-thirds or less, tiny hairs on the ends of the hind femora mostly yellow
 *transversalis* Curran
 Pile of face mostly yellow on the slopes, hind femora black on basal four-fifths or more 13
13. Yellow spots on the second segment extend over the side margins in half or more of their greatest width, generally smaller species
 *rectus* Osten Sacken
 Yellow spots reach the sides in only about one-fourth of their greatest width 14
14. Tiny black hairs on ends of hind femora sparse, venter unicolorous
 *vitripennis* Meigen
 Tiny black hairs very numerous, extending over the apical third, venter usually with blackish markings *ribesii* Linnaeus
15. Abdomen with sides strongly reflexed downward, the apical segments all visible from above *transversalis* Curran
 Abdomen of normal shape 16
16. Basal half or more of hind femora black *vitripennis* Meigen
 Basal half at least of hind femora yellow 17
17. Lower third of front yellow, femora entirely yellow, females only
 *opinator* Osten Sacken
 Lower third of front blackish, often covered with fine gray pollen 18
18. Abdominal bands nearly straight transversely and reach sides in almost their full widths, posterior femora with a pre-apical brown band
 *rectus* Osten Sacken

Abdominal bands narrowed in the middle posteriorly and reach the side margins in half their widths, posterior femora seldom with a pre-apical brown band *ribesii* Linnaeus

Syrphus autumnalis, new species

Figures 1, 2, 11, 12

Face with a narrow brown stripe, abdominal bands narrow, semi-interrupted or interrupted and reach the sides very narrowly or not at all; pile on outer sides of the hind tibiae extensive, and black nearly the whole length. Length, 10 to 11 mm.

MALE: Face yellow, with a narrow, slightly diffused, reddish brown stripe reaching over the tubercle and around the upper oral edge, the pile not conspicuous, black on the upper slopes and yellowish on the lower slopes; the fine pubescence whitish and found only along the lower slopes but connecting to the frontal triangle where it is quite heavy but leaving a shining black area above the antennae and a shining, generally yellowish W, the inner margins of the outer arms black; pile of the front all black; cheeks yellow, slightly darker just below the eyes, lightly coated with whitish pubescence and white pile, both of which become heavier on the occiput, with a few black cilia overhanging the eyes; ocellar triangle gray-black, with black pile; antennae brownish, the under sides of the segments yellowish, arista reddish.

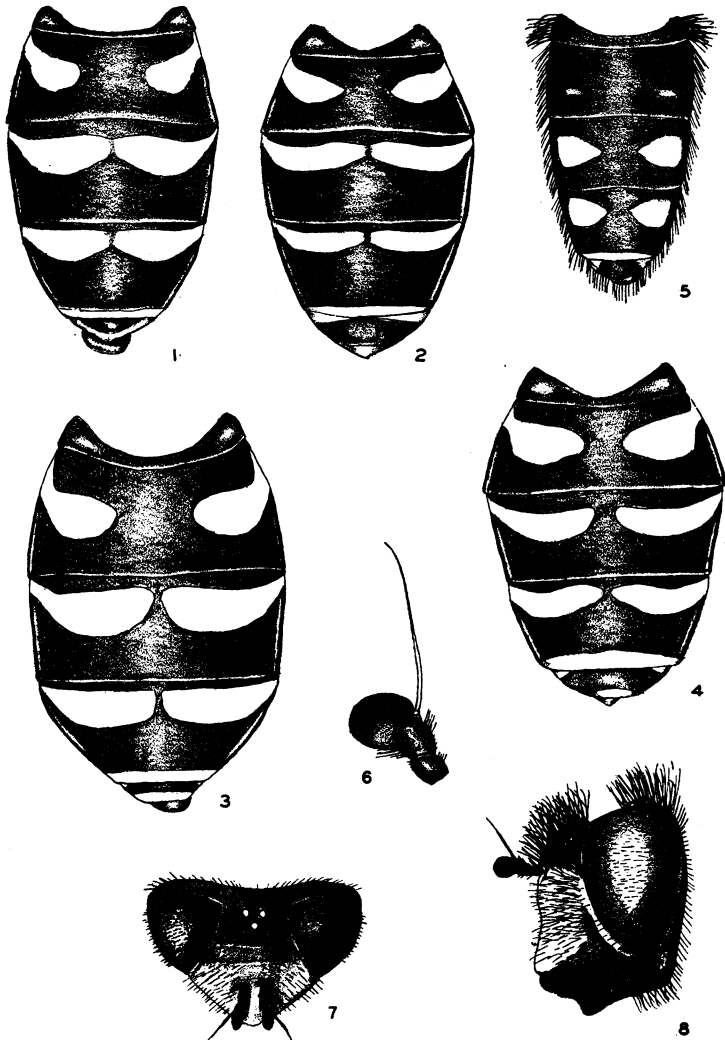
Mesonotum dark, dull, with very faint brownish vittae, the pile all golden yellow, heavier along the sides; pleura dark, dull, with a light coating of fine gray pubescence, the pile all yellow. Scutellum dull yellow, pile all black, the fringe yellow.

Legs yellow to reddish, black as follows: basal half or a little less of the four front femora, basal two-thirds of the hind femora, a broad median ring on the hind tibiae, middle three segments of the four front tarsi and all but the apical segment of the hind tarsi; pile mostly yellow, a few black hairs on the outer apical margins of the four front femora, a little more extensively on the hind femora, rather thick on the outer margin of the hind tibiae, and generally on the outer or top sides of the tarsi; basal hairs of the femora longer and mostly yellow.

Wings hyaline, very dilutely yellowish, the stigma yellow; halteres yellow, squamae yellow, with golden yellow fringe; plumule pale yellow.

Abdomen black, mostly dull, more shining apically and along the sides; the second tergite with oval yellow spots narrowly connected to the basal corners, the third and fourth tergites yellow fasciate, the bands deeply notched in the middle posteriorly and very narrowly connected to the basal corners of the segments; apex of the fourth and fifth and basal

corners of the fifth tergites yellow; pile mostly black, yellow basally on the sides and less so on the basal corners of the other tergites; venter blackish, with the apical margins broadly, and large oval basal spots on each sternite, yellow. The black and yellow markings of the venter are



FIGS. 1, 2. *Syrphus autumnalis*, new species, abdomens of male and female. FIGS. 3, 4. *Syrphus jonesi* Fluke, abdomens of male and female. FIGS. 5-8. *Stenosyrphus bulbosus*, new species. 5. Abdomen of male. 6. Antenna. 7. Head of female, top view. 8. Head of male, profile.

quite conspicuous and not so diffuse as on related species. The ventral pile is long and yellow, with very few short appressed black hairs towards the apex.

FEMALE: Front heavily gray to light brown pubescent, leaving the upper third nearly bare and a large triangle above the W black. Legs paler, only the extreme base of the femora black; however, the hind femora usually have a broad darkened ring on the apical half, very indistinct on some specimens; the pile generally paler. Abdominal fasciae narrower, those on the third and fourth tergites usually connected but sometimes interrupted. Venter generally unicolorous, with faint longitudinal darker spots or a vitta.

TYPES: Holotype, male, Low Bush, Ontario, Lake Abitibi, August 10, 1925 (N. K. Bigelow); allotype, female, Fort Chimo, Quebec, July 29, 1948 (H. N. Smith). Paratypes: 105 females and 26 males, Fort Chimo, Quebec, late July, 1948 (Smith and MacLeod); 22 females, Gillam, Manitoba, late July, 1949 (J. B. Wallis); six females, Reindeer Depot, Mackenzie Delta, August 2-17, 1948 (J. R. Vockeroth); eight females, Yellowknife, Northwest Territories, August, 1949 (Hall and Ingraham); one female, Whitehorse, Yukon, July 5, 1948 (W. R. Mason); one female, Dry Creek, Yukon, July 23, 1948 (Mason and Hughes); one male, Dawson, Yukon, July 16, 1949 (W. W. Judd); one male, Saw Mill Bay, Northwest Territories; June 24, 1948 (Hardwick); a pair, Moose Factory, Ontario, July, 1949 (Williams and Vockeroth); two males and two females, Great Whale River, Province of Quebec, July 24 and August 2, 1949 (J. R. Vockeroth); one female, Coal River, British Columbia, August 21, 1948 (Mason); one female, Wabowjeu, Manitoba, August 10, 1949 (Wallis); one female, Rupert House, Province of Quebec, June 16, 1949 (Le Boux); one female, Orillia, Ontario, September 24, 1921 (C. H. Curran); two females, Norcross, Maine, July 10, 1916; one female, Hopedale, Labrador, summer 1933 (F. C. Sears); one female, mile 50, Stease Highway, Alaska, July, 1950; three females, Luce County, Michigan, Dar Park, September 2, 1935 (Steyskal); two females, Baraga County, Michigan, August 27, 1952; one female, Rhinelander, Wisconsin, May, 1946 (Fluke); two females, Door County, Wisconsin, August, 1927 (Fluke); and one female, Lakewood, Wisconsin, September 6, 1946 (Fluke).

As will be noted, the only males taken came from the far north, mostly at Fort Chimo, Quebec, are outnumbered by the females five to one.

I have used the name *autumnalis* which was applied to this species years ago by Curran who did not publish it at that time owing to the uncertainty of Jones's species *similis* (*jonesi*).

Holotype in the American Museum of Natural History ; allotype in the Canadian National Museum at Ottawa ; paratypes in the Dreisbach and Fluke collections.

Syrphus jonesi Fluke

Figures 3, 4, 13

Syrphus similis JONES (not Blanchard), 1917, Ann. Ent. Soc. Amer., vol. 10, p. 224.

Syrphus similis JONES, 1918, Bull. Colorado Agr. Exp. Sta., no. 269, p. 72 (fig.).
Syrphus ribesii jonesi FLUKE, 1949, Proc. U. S. Natl. Mus., vol. 100, p. 41.

Face entirely yellow, with no indication of a brown stripe, spots on the second tergite of the female twice as broad (front to rear) as the bands on the third and fourth tergites. The type is a large female, about 12 mm. long.

All the material I have seen in the past and recorded as *jonesi* belongs to *autumnalis*, new species, including the Alaskan specimens noted in my paper referred to above. The receipt of more than 200 specimens of *Syrphus* from the arctic regions of Canada has prompted me to revise my opinion of the species of this genus and led to the present study. In this lot are five females that agree with Jones's type and one male that has an entirely yellow face and with interrupted fascia on the abdomen. A study of the genitalia of this specimen and those males with a brown stripe on the face (*autumnalis*) show little differences between them. The great majority of the arctic specimens are females, but they are in general quite uniform in appearance. I feel, however, that *jonesi* is a good species.

Jones described his species from Colorado. The specimens I am referring to it are as follows: one male, Fort Chimo, Quebec, July 24, 1948 (H. N. Smith); two females, same place, July 28 and 29 (MacLeod and Smith); one female, Watson Lake, Yukon, June 25, 1948 (M. T. Hughes); and one female, Whitehorse, Yukon, August 5, 1949 (D. G. Peterson). It is possible that the male I am calling *jonesi* is not that species. Very definitely it is not the same as the other males from the same collection, most of them from Fort Chimo.

Jones's type was examined a couple of years ago but is not before me at present for comparisons with the Fort Chimo females mentioned above. Jones has figured in color his type, and the very large spots on the second tergite are plainly seen. The specimen illustrated in this paper comes from Fort Chimo. I have collected in Colorado, in the vicinity of Estes Park, many times, but have never taken any specimen like *jonesi*.

Syrphus ribesii (Linnaeus)

Figures 9, 16-20

Musca ribesii LINNAEUS, 1758, Systema naturae, ed. 10, p. 593.*Syrphus ribesii* WILLISTON, 1886, Bull. U. S. Natl. Mus., no. 31, p. 77.*Syrphus ribesii* CURRAN, 1921, Canadian Ent., vol. 53, p. 154.*Syrphus ribesii* FLUKE, 1933, Trans. Wisconsin Acad. Sci. Arts, Letters, vol. 28, p. 67.

Specimens of this species from Finland, Scotland, Holland, France, Spain, Italy, and North America are before me and have been studied in considerable detail. A thorough examination of the genitalia of the several representatives shows significant variations in the shape of the lingula from a rather elongate narrow form (Scotland) to a broader, apically notched form (Colorado). All the American specimens and one from Holland have a broader lingula than any of the others examined. In addition the color of the pile on the face is almost entirely black (Holland), grading to mostly yellow in others. The black markings on the venter also vary considerably, and for some time it was thought that the American specimens might represent a distinct subspecies. Because the numbers of specimens from European countries are few, I feel I can only call attention to possible specific differences. The illustrations given here show the variations in the shape of the lingula.

My general conclusion at this time is that these specimens all belong to one species, with the possible exception of both Holland and Colorado representatives. Large series of specimens should be collected and life history studies made before a splitting up of this well-known species is accepted.

Syrphus vittafrons Shannon

Figures 10, 14

Syrphus ribesii vittafrons SHANNON, 1916, Proc. Biol. Soc. Washington, vol. 29, p. 202.

For some time I have considered this a good species, distinct from *ribesii*. It is typically a common species in the eastern United States, and where it occurs *ribesii* is conspicuously absent. The penis sheath to which the lingula is attached is generally much narrower from a side view and the lingula is slightly more elongate than in *ribesii*. The brown stripe on the face will readily identify it except for *autumnalis*, a new species described here. The cross bands on the abdomen on the latter species, however, are very narrow and frequently interrupted, which never occurs on *vittafrons*.

Syrphus rectus Osten Sacken

Figure 15

Syrphus rectus OSTEN SACKEN, 1875, Proc. Boston Soc. Nat. Hist., vol. 18, p. 140.

Syrphus rectus CURRAN, 1921, Canadian Ent., vol. 53, p. 155.

There has been some question regarding the distinctness of this species from *ribesii*. An examination of the lingula, illustrated here, shows conclusively that the species is good. The females are quite easily distinguished by the bands, which reach the sides in nearly their full widths, but the males are more difficult to characterize. The beginning student should have determined specimens before him for comparison, as the males could very easily be classified as small *ribesii* or might be confused with those of *vitripennis*.

Stenosyrphus bulbosus, new species

Figures 5-8

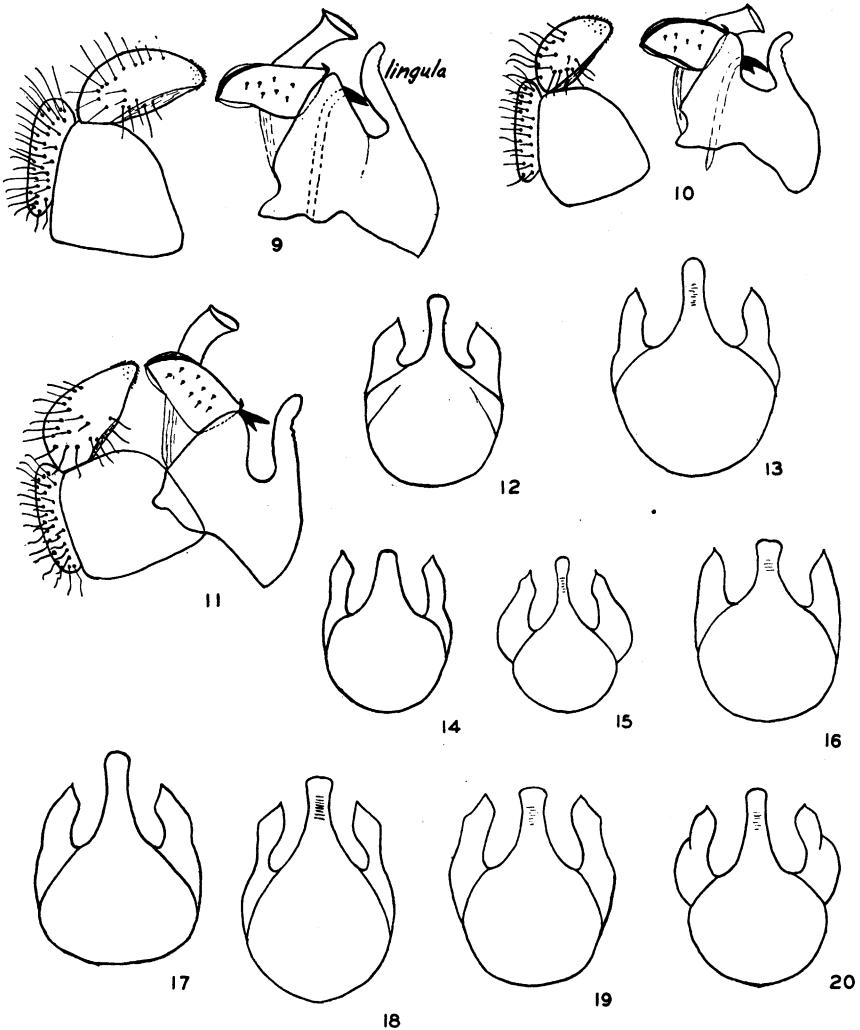
This species belongs to the *tarsatus-sodalis* group but is readily recognized in the male by the greatly inflated front, with its thick tuft of black pile. Length, 7 to 11 mm.; average, 9 mm.

MALE: Face very broad and inflated, dark yellow, very thinly pale pollinose on the sides, the pile black; front dark aeneous, broad and inflated, brownish pollinose and heavily black pilose; the lunular area above the antennae somewhat sunken; cheeks and broad oral margin shining black, pollinosity obscure, pile reddish and black mixed; ocellar triangle black, pile black, yellow to golden and long behind the ocelli; occiput thin above, broader and lightly gray pollinose below, the cilia above very long and black. Antennae dark brown to black, the arista black, microscopically brownish pubescent. Eyes pilose.

Thorax black, the mesonotum with a bronze cast, particularly in the middle, and faintly vittate; the pile yellowish brown on the mesonotum, with a lateral stripe of black pile, sometimes the entire lateral margins black pilose; pleural pile mostly black, brownish in front of the metathoracic spiracle and often patches above the front coxae, yellow on the mesosternum; scutellum blackish around the edges, the disc with a paler opalescent cast, pile black, with frequent brownish hairs anteriorly and on the ventral fringe.

Legs black, apical third or more of the four front femora, apical sixth of the hind femora, the front tibiae, all but a median dark ring on middle and hind tibiae yellowish to brownish; the pile generally black, with numerous golden hairs on the femora, extra long on the under sides of

the front and middle femora; the tarsi entirely black; hind coxal hairs mostly whitish. Wings hyaline; squamae darkened, the fringe yellowish; halteres dark, the knobs usually somewhat yellowish.



FIGS. 9-20. Male genitalia of *Syrphus* species. 9. *S. ribesii* Linnaeus (Holland), side view. 10. *S. vittafrons* Shannon, side view. 11. *S. autumnalis*, new species, side view. 12-20. Penis sheath. 12. *S. autumnalis*, new species. 13. *S. jonesi* Fluke. 14. *S. vittafrons* Shannon. 15. *S. rectus* Osten Sacken. 16-20. *S. ribesii* Linnaeus. 16. From Colorado. 17. From Alaska. 18. From Finland. 19. From Holland. 20. From Scotland.

Abdomen black, considerably dulled, more shining posteriorly; first segment entirely black; second tergite with a pair of inconspicuous yellow spots that are almost absent in some specimens; third and fourth tergites each with a pair of triangular yellow spots that are usually (?) separate from the margins but may reach the anterior corners, these spots are coated with bloom that can be seen at an angle; apical margin of the fourth and basal corners of the fifth yellow; genital segments generally shining blackish. Venter dull black owing to gray pollen, the apical margins of the sternites narrowly pale yellowish. Pile of the abdomen golden to black, mostly black at the apical margins of the tergites and terminal segments, the sternites mostly yellowish pilose, all erect.

FEMALE: The front is very wide and has a broad transverse depression in the middle which is pollinose; abdominal spots limited to narrow bands on third and fourth tergites, the entire abdomen more shining; yellowish pile paler, especially on the mesonotum and abdomen; hind coxal hairs whitish, occasionally a few black hairs present. Two of the paratype females are without any abdominal spots, and another has only a weak pair on the third tergite. One female, which appears teneral, has the face darkened.

TYPES: Holotype, male, Cambridge Bay, Northwest Territories, Canada, August 6, 1950 (E. H. N. Smith); allotype, female, Chesterfield, Northwest Territories, Canada, August 21, 1950 (J. G. Chillcott). Paratypes: Male, Cambridge Bay, Northwest Territories, August 18, 1950 (G. K. Sweatman); male, same data as holotype, August 14, 1950; male, same data as allotype; three females, same data as allotype; one female, same data as holotype, July 11, 1950. Types in the Canadian National collection, paratypes in the American Museum of Natural History and Fluke collections.

The females of this species will be difficult to separate from those of *mallochi* Curran, a species somewhat smaller on an average and with black pile on the hind coxae. The front of *mallochi* is wide but apparently not so wide as that of *bulbosus*. I have also never seen a female of *mallochi* without yellow spots on the second tergite.

